

Hanging Out and Messing About

The background features a stylized, abstract illustration of buildings. The buildings are composed of various geometric shapes and patterns, primarily in shades of teal, orange, and yellow. The central building is a tall, white structure with a teal frame and a hexagonal pattern. To its left is a shorter, orange building with a similar hexagonal pattern. To its right is a yellow building with a similar pattern. The background is a mix of teal and brown tones.

Evelien Hoeben

Elaborating on the relationship
between unstructured socializing
and adolescent delinquency

Hanging Out and Messing About

Elaborating on the Relationship
Between Unstructured Socializing
and Adolescent Delinquency

Evelien Hoeben

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VRIJE UNIVERSITEIT

Hanging Out and Messing About

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Part I.

Unstructured Socializing
and Delinquency





Chapter One.

Aims and Context



Aims and Context

A group of adolescents hanging out, chatting, not doing anything in particular is a familiar sight of all times and all cultures. Writings from as early as the Middle Ages mention youths who find joy in trotting around on the streets until late in the evening, “dancing, singing, cursing and soiling” and recommend to parents to keep their kids at home at night (Den Heussen, 1657: 15, 76, literature study from Exalto, 2004). This phenomenon of adolescents hanging out is also referred to as *unstructured socializing*. A recent large cross-national study in Europe, USA, and Latin America showed that 75 percent of the adolescents spent time in unstructured socializing at least once a week (Junger-Tas et al., 2012), illustrating the widespread and popular nature of the activity. Adolescents’ focus on peers and their desire to meet friends away from parental supervision is part of a developmental process toward adulthood, where they distance from their parents, discover their own identities and develop social skills, such as reconciliation management and tolerance (Allen and Antonishak, 2008; Giordano, 2003; Vitaro, Boivin, and Bukowski, 2009). Despite these developmental advantages, the phenomenon of teenagers hanging out continues to attract societal concern. Unsupervised youths hanging out may cause nuisance for residents and induce fear in passers-by. Youths who spend a lot of their time hanging out also evoke concern from their parents, teachers, and other involved adults because idle leisure activity is generally connoted with substance use, ‘wrong’ friends, low academic achievement, and poor life choices. Furthermore, involvement in unstructured socializing is associated with increased risks for vandalism, shoplifting, and other forms of delinquency.

This book addresses the relationship between adolescents’ involvement in unstructured socializing (‘hanging out’) and their involvement in delinquency. This relationship has long been recognized in sociology and criminology (e.g., Agnew and Petersen, 1989; Felson and Gottfredson, 1984; Hirschi, 1969; West and Farrington, 1977) but was brought to a broader attention with the publication of Osgood and colleagues in 1996. In their

routine activity theory of general deviance, the authors adopt a situational perspective on individual delinquency, recognizing that minor deviant acts committed by teenagers are often not planned ahead or necessarily the result of criminal dispositions. Rather, these acts occur in the spur of the moment, out of boredom, in search of excitement, or to express toughness in front of peers (Briar and Piliavin, 1965; Matza, 1964; Warr, 2002). Activities rich of opportunities and situational inducements for deviance, which are thus particularly crime conducive, were termed ‘unstructured socializing’.

In this study, I build on the theory and empirical work of Osgood et al. (1996) and the stock of literature that has been published since on the relationship between unstructured socializing and delinquency (e.g., Bernasco et al., 2013b; Bernburg and Thorlindsson, 2001; Haynie and Osgood, 2005; Maimon and Browning, 2010). The aim of this study is to elaborate on the relationship between unstructured socializing and delinquency theoretically, methodologically, and empirically. To pursue this aim, I will examine the *underlying processes* that explain the relationship, improve upon the *operationalization* of the concept of unstructured socializing and specify *situational conditions* that amplify or diminish the relationship. This first chapter provides the theoretical background of the unstructured socializing perspective of Osgood et al. (1996) and an empirical background of prior research into the relationship between unstructured socializing and delinquency¹. I will then briefly outline the contributions of the current study, discuss the applied data and methods, and provide an overview of the remaining chapters.

Unstructured socializing and adolescent delinquency

Prior to the publication of Osgood et al. in 1996, criminologists drew “on virtually every major theory in the field” to contextualize the relationship between unstructured socializing and adolescent delinquency (Agnew and Petersen, 1989: 333). For example, studies applied social control theory, arguing that involvement in conventional activities strengthens an individual’s

1 Sections of this chapter have been incorporated in a broader review article on peer influence and delinquency (Meldrum et al., 2016).

bond to society, provides attractive alternatives to delinquency, and fosters conventional beliefs by exposing adolescents to conventional role models (Hawdon, 1996; Hirschi, 1969). Thus, unconventional leisure activities were posited to weaken bonds and provide opportunities for delinquency. Other studies have drawn on subcultural deviance theory and argued that participation in unstructured activities such as hanging out, going to parties and dances, or driving around in a car shows subcultural preferences associated with a party subculture that values idleness and disdain for school and exposes adolescents to delinquent individuals, increasing their own risk for involvement in delinquency (Hagan, 1991). Principles from strain theory have been adapted to argue that certain leisure activities provide individuals ways to channel frustration and need for excitement in socially acceptable ways. A lack of such alternatives could result in delinquent behavior (Agnew, 1992; Roberts, 1985). Several studies discuss the relationship between 'unsupervised time with peers' and antisocial behavior under the guise of after-school care arrangements (Flannery, Williams, and Vazsonyi, 1999; Galambos and Maggs, 1991; Pettit et al., 1999). Finally, some scholars have applied routine activity theory to argue that leisure activities cause adolescents to spend time further away from home, thereby decreasing opportunities for parental supervision and thus increasing the risk of delinquency (Felson and Gottfredson, 1984; Felson, 1986; Riley, 1987).

In a now widely cited publication, Osgood et al. (1996) adapted the routine activity theory (Cohen and Felson, 1979) and lifestyle theory (Hindelang, Gottfredson, and Garofalo, 1978) to an individual level perspective on deviance. Their unstructured socializing perspective, or routine activity theory of general deviance, aimed to explain the association between daily activities and individual patterns of delinquency. Essential to the unstructured socializing perspective are two arguments. First, some individual routine activities are more conducive to deviance than others. Second, individuals who spend more time in such 'deviance conducive' routine activities should engage in greater deviance.

For the first argument, Osgood et al. (1996) theorized that three features increase the risk of deviance for a given activity: The presence of peers, the absence of authority figures, and lack of a structure. The *presence of peers* during an activity should promote deviance because peers can serve as resources in fostering delinquency by providing practical help (e.g., serving as back-up

or look-out) and by making deviance more rewarding by conferring status and reputation to individuals; peers can provide an 'appreciative audience'. The absence of *authority figures* decreases the risk of getting caught, thereby reducing the potential consequences of deviant behavior and increasing the perception that a deviant act can successfully be completed. Osgood et al. (1996) distanced from the distinction between handlers, guardians, and place managers (Felson, 1995), and argued that the social control function of the authority figures resides in their role obligations in the setting and not in their bond with the potential offender, victim, or location. The concept generally refers to conventional authority figures, such as parents or teachers, rather than other non-conventional authority figures such as gang leaders. A *lack of structured activity*² further enables engagement in deviance because "greater structure means that more time will be spent in designated ways, and that this time will not be available for deviance" (Osgood et al., 1996: 641). Organized activities are also more likely than unstructured activities to confer responsibilities for social control to one or more of the present individuals. Hence, individuals engaging in unstructured activities will have less social control exerted over them. Based on these assertions, Osgood et al. (1996) coined the term unstructured socializing to represent an activity with peers conducted in the absence of authority figures and without any structure.

With regard to the second argument, Osgood et al. (1996) argued that most adolescents are open to the idea of deviance because the motivation for delinquency can be inherent in the situation as opposed to within the individual (following Briar and Piliavin, 1965), and because most adolescents are open to deviant values. This does not mean that adolescents reject conventional values; subterranean values that can be linked to delinquency, such as a search for excitement and approval of recklessness and toughness, can exist alongside conventional values (Matza and Sykes, 1961). Although Osgood et al. (1996) did not assume that all adolescents are equally likely to respond to opportunities for delinquency, they argued that "most people have the potential for at least occasionally succumbing to an opportunity for deviant behavior" (Osgood et al., 1996: 639). In summary, the theory developed by Osgood et al. (1996) posits that unstructured socializing with

2 Unstructured activities, according to Osgood et al. (1996: 640), are activities that "carry no agenda for how time is to be spent". More recently, Wikström et al. (2012a: 280) defined unstructured activities as activities that are not "organized or directed towards a particular end".

peers provides individuals with socially rewarding situational opportunities for delinquency. As such, individuals who spend more time in unstructured socializing are likely to engage in more delinquency.

Since the publication of Osgood et al. in 1996, the concept of unstructured socializing has received increasing attention in sociological and criminological literature. Works that were published after 2000 on the relationship between unstructured or unsupervised activities with peers, contextualize the relationship almost exclusively³ in Osgood's extension of the routine activity theory. Efforts have been made to integrate the perspective with other theories, such as social learning theories (e.g., Bernburg and Thorlindsson, 2001; Boman, 2013), social disorganization theory (Bernburg and Thorlindsson, 2007; Maimon and Browning, 2010), strain theory (Op de Beeck and Pauwels, 2010), self-control theory (Hay and Forrest, 2008) and dual-systems theory on cognitive processing (Thomas and McGloin, 2013). Moreover, large datasets have incorporated items in their data collection to scrutinize the unstructured socializing concept (e.g., Add Health, PHDCN). Unstructured socializing is increasingly recognized as having its own effect on adolescent delinquency, independent of the effect of having delinquent friends (Haynie and Osgood, 2005).

Empirical studies on unstructured socializing

Since the publication of Osgood et al. (1996), several empirical studies appeared that incorporated measures for unstructured socializing. To provide an empirical context for the current study, this section gives an overview of the empirical research that has been conducted on the relationship between unstructured socializing and adolescent delinquency, based on a systematic literature review. This review was not aimed at giving an exhaustive account of the literature, but at gaining insight into the current state of research and the factors that play a role in the relationship. The specifics of the literature search, the review method, and a summary of the findings from the 74 studies that met the selection criteria can be found in Appendix B at the end of this book.

3 Exceptions are a few studies on social control theory (Barnes et al., 2007; Wong, 2005), subcultural deviance theory (Thorlindsson and Bernburg, 2006), and situational action theory (Weerman et al., 2015; Wikström and Butterworth, 2006; Wikström et al., 2010; Wikström et al., 2012a).

Descriptive data of the studies and generality of the unstructured socializing-delinquency relationship

To give the reader an idea of the body of literature on the relationship between unstructured socializing and delinquency, descriptive data of the studies are provided in Table 1.1. The Table displays the countries in which the studies were conducted, the age, gender, and ethnicity of the respondents, whether the study took place in an urban or rural area, and whether the design was longitudinal or cross-sectional. Table 1.2 provides an overview of the types of delinquency that have been examined in relation to unstructured socializing. Note that only a few studies reported null findings; almost all of the studies found a positive association between involvement in unstructured socializing and delinquency, regardless of the research and measurement strategy employed. This speaks to the robustness of the relationship across countries, stages of adolescence, research designs, and types of delinquency.

As can be seen in Table 1.1, the link between unstructured socializing and delinquency/substance use has been observed in a number of different cultural contexts. While the majority of studies have been based on samples of individuals from within the United States (47 studies based on 29 different research projects), a large portion was also conducted in Western European countries. Specifically, studies have been based on data collected in the Netherlands (e.g., Bernasco et al., 2013b; Junger and Wiegersma, 1995; Sentse et al., 2010; Weerman et al., 2013), Belgium (Op de Beeck and Pauwels, 2010), England (e.g., Riley, 1987; Wikström and Butterworth, 2006, Wikström et al., 2010; Wikström et al., 2012a), Scotland (Miller, 2013; Smith and Ecob, 2013), Germany (Svensson and Oberwittler, 2010), and Switzerland (Müller, Eisner, and Ribeaud, 2013). Other studies were conducted in Northern Europe, namely Iceland (Bernburg and Thorlindsson, 2001; 2007; Thorlindsson and Bernburg, 2006) and Sweden (Svensson and Oberwittler, 2010), and in 'other western' countries, namely Canada (Galambos and Maggs, 1991; Hundleby, 1987; LaGrange and Silverman, 1999; Wong, 2005) and Australia (Moore and Ohtsuka, 2000). Three studies have examined and established the relationship cross-nationally (Steketee, 2012; Svensson and Oberwittler, 2010; Vazsonyi et al., 2002). Two of these studies also incorporated samples from outside of Western Europe and the USA: Vazsonyi et al. (2002) included respondents from Eastern Europe (Hungary), and Steketee et al. (2012)

included respondents from Eastern Europe (e.g., Poland, Russia), Southern Europe (e.g., Spain, Italy), and Latin America (e.g., Venezuela, Suriname).

Table 1.1. Descriptive data of studies ($N = 74$ publications)

	Research projects	Studies	Mean no. of studies per research project
Geographical location of study			
USA	29.0	47.0	1.6
Western European	12.0	19.0	1.6
Other western	7.0	9.0	1.3
Non-western	2.0	2.0	1.0
Cross-national studies	3.0	3.0	1.0
Urban background			
Urban	15.0	23.0	1.5
Suburban	5.0	5.0	1.0
Rural	3.0	4.0	1.3
Urban and rural	19.0	37.0	1.9
Unknown	9.0	9.0	1.0
Age respondents ^a			
Children (<12)	2.0	2.0	1.0
Children and adolescents (8-18)	4.0	7.0	1.8
Adolescents (11-18)	8.0	18.0	2.3
Early adolescents (11-14)	12.0	12.0	1.0
Middle adolescents (14-16)	10.0	15.0	1.5
Late adolescents (16-19)	9.0	11.0	1.2
Adolescents and young adults (11-21)	7.0	7.0	1.0
Young adults (18-25)	3.0	4.0	1.3
Adults	1.0	1.0	1.0
Other demographics			
Gender	16.0	18.0	1.1
Ethnicity	4.0	4.0	1.0
Data structure			
Cross-sectional	34.0	39.0	1.1
Longitudinal	24.0	39.0	1.6

NOTES: The numbers in the 'studies' column refer to the number of papers, the numbers in the 'research projects' column correspond to the number of different data collections on which these papers were based.

^a Studies that overlapped three or more age categories (e.g., studies that included respondents in the ages 11 to 19 years) were included in the general Adolescents category. For many studies, the ages of the respondents overlapped two age categories. Those studies were categorized using the most consistent age range of their respondents. The extreme categories were prioritized: Studies that incorporated, for example, children, early, and middle adolescents were categorized under Children and adolescents.

Most of the studies incorporated respondents from both urban and rural backgrounds (19 research projects) or from urban backgrounds only (15 research projects). Few studies were conducted among suburban samples

(Agnew and Petersen, 1989; Fleming et al., 2008; Galambos and Maggs, 1991; Greene and Banerjee, 2009; Moore and Ohtsuka, 2000) and rural samples (Junger and Wiegersma, 1995; Lam, McHale, and Crouter, 2014; Meldrum and Clark, 2015).

As expected, most studies have been based on samples of adolescents. The studies cover all stages of adolescence: Early adolescence (ages 11 to 14; e.g., Hay and Forrest, 2008), middle adolescence (ages 14 to 16; e.g., Miller, 2013), and late adolescence (ages 16 to 19; e.g., Chen et al., 2008). Two studies focused exclusively on children (McHale, Crouter, and Tucker, 2001; Posner and Vandell, 1999) and confirmed the relationship between unstructured socializing and problem behavior among samples of, 10- to 12-year-olds and 8- to 11-year olds, respectively. A few studies covered a broad age range and included children as young as eight (e.g., DiPietro and McGloin, 2012; Gardner, Roth, and Brooks-Gunn, 2009; Lam, McHale, and Crouter, 2014; Maimon and Browning, 2010; Wong, 2005). In addition, several studies found supportive evidence among samples comprised either primarily or exclusively of young adults (e.g., Boman, 2013; Hawdon, 1996; Hughes and Short, 2014; Osgood et al., 1996; Sun and Longazel, 2008; Thomas and McGloin, 2013; Wallace and Bachman, 1991). One study confirmed the relationship for adult incarcerated offenders (Felson et al., 2012).

Although gender differences are examined relatively infrequently, studies also suggest the association between unstructured socializing and delinquency holds across both male and female samples (Barnes et al., 2007; Gage et al., 2005; Goldstein, Eccles, and Davis-Kean, 2005; Lam, McHale, and Crouter, 2014; Steketee, 2012; Weerman et al., 2015; Yin, Katims, and Zapata, 1999). However, not all studies reach this conclusion. Some studies found that unstructured socializing had a stronger effect on delinquency for males than for females (Augustyn and McGloin, 2013; Lotz and Lee, 1999; Novak and Crawford, 2010; Sentse et al., 2010), whereas outcomes of another study suggested that the relationship was stronger for females (Galambos and Maggs, 1991). The unstructured socializing-*substance use* relationship was found for both males and females (Augustyn and McGloin, 2013; Barnes et al., 2007; Gage et al., 2005; Lotz and Lee, 1999). Similarly, racial differences have rarely been considered in studies examining the unstructured socializing-delinquency/substance use link. Among those that have, there is some evidence to suggest that the association is stronger for Whites relative

to non-Whites (Barnes et al., 2007; Posner and Vandell, 1999), but other research found this may not be the case (Goldstein, Eccles, and Davis-Kean, 2005; Lotz and Lee, 1999).

From a methodological standpoint, the empirical association is found in both cross-sectional (e.g., Barnes et al., 2007; Wong, 2005) and longitudinal studies (e.g., Augustyn and McGloin, 2013; McHale, Crouter, and Tucker, 2001; Regnerus, 2002; Staff et al., 2010). Thirty-nine studies, based on twenty-four different datasets, examined and confirmed a longitudinal relationship between involvement in unstructured socializing and delinquency.

In addition, unstructured socializing is associated with a wide variety of delinquent behaviors. Table 1.2 gives an overview for the studies incorporated in this review. Most studies examined a general measure for delinquency that often included items on substance use (e.g., Haynie and Osgood, 2005; Thomas and McGloin, 2013). Others established relationships between unstructured socializing and violent behavior (e.g., DiPietro and McGloin, 2012; Miller, 2013), property offending (e.g., Anderson and Hughes, 2009; Vazsonyi et al., 2002), and substance use (e.g., Thorlindsson and Bernburg, 2006; Wallace and Bachman, 1991). However, two studies from different research projects found non-significant relationships between involvement in unstructured socializing and violence (Müller, Eisner, and Ribeaud, 2013; Mustaine and Tewksbury, 2000). Other studies reported null-findings for drug offenses (Gottfredson, Cross, and Soulé, 2007; LaGrange and Silverman, 1999) and for general delinquency (Gottfredson, Cross, and Soulé, 2007; Weerman, 2011).

In conclusion, the vast majority of studies supported the finding of Osgood et al. (1996). Greater time spent in unstructured socializing increases delinquency and substance use, regardless of the specific sample or research strategy that was used. Although not all studies have agreed with this finding (Gottfredson, Cross, and Soulé, 2007; LaGrange and Silverman, 1999; Müller, Eisner, and Ribeaud, 2013; Mustaine and Tewksbury, 2000; Weerman, 2011), the weight of the evidence supports the contention that the construct of unstructured socializing exerts substantive effects on delinquency and substance use.

In the following sections, I will turn to a discussion of how the studies have operationalized the concept of unstructured socializing, and discuss their findings regarding mediation and moderation of the unstructured socializing-delinquency/substance use relationship.

Table 1.2. Types of delinquency and substance use (N = 74 publications)

	Research projects	Studies	Yes ^a	No ^a
General delinquency	43.0	56.0	54.0	2.0
Violence/aggression/assault	16.0	19.0	17.0	2.0
Property/theft/vandalism	12.0	14.0	14.0	.0
Minor	5.0	5.0	5.0	.0
Serious	5.0	5.0	5.0	.0
Driving under influence	1.0	1.0	1.0	.0
Dealing drugs	2.0	2.0	2.0	.0
Weapon carrying	1.0	1.0	1.0	.0
Substance use general	6.0	6.0	5.0	1.0
Cigarette use	5.0	5.0	5.0	.0
Alcohol use	10.0	12.0	12.0	.0
Drugs general	5.0	5.0	4.0	1.0
Soft drugs	4.0	8.0	8.0	.0
Hard drugs	1.0	1.0	1.0	.0

NOTES: Several studies incorporated more than one dependent variable. The number of publications, therefore, does not match the number of studies discussed in this Table. The numbers in the 'studies' column refer to the number of papers in which the relationship between unstructured socializing and this variable was discussed, the numbers in the 'research projects' column correspond to the number of different data collections on which these papers were based.

^aThe numbers in the 'yes' column refer to the number of studies that found a relationship, the numbers in the 'no' column refer to the number of studies that did not find a relationship.

Operationalization of unstructured socializing

As previously discussed, the unstructured socializing concept encompasses three elements: The presence of peers, the absence of authority figures, and a lack of structure. The measurement of this concept varied considerably across the studies. In fact, most studies did not explicitly measure all three conditions that define a situation of unstructured socializing. In this section, three major approaches are distinguished that have been used for examining the association between unstructured socializing and delinquency. In the overview Table B1 in the Appendix is provided for each study under what category (1-3) its operationalization of the unstructured socializing concept was classified.

The first and most common approach is measuring unstructured socializing in such a way that at least one of the three elements is present but where at least one other element is ambiguous. Many studies use survey items that adequately refer to respondent involvement in specific unstructured activities generally assumed to occur in the presence of peers. Such

measurement strategies are often ambiguous in terms of whether authority figures are present. For example, the measures appearing in Osgood et al. (1996) asked respondents about the frequency in which they participated in the following activities: Driving around in a car (or motorcycle) just for fun, getting together with friends informally, going to parties or other social affairs, and going out for fun and recreation. Importantly, these are all unstructured activities that are likely to occur in the presence of peers; the item 'getting together with friends informally' specifically refers to the presence of peers. However, the absence of authority figures is only *implied* by these items. While many studies employ measures that are ambiguous about the presence or absence of authority figures, other studies adequately measure unsupervised time spent with peers yet are not specific about the activity being engaged in (e.g., Lam, McHale, and Crouter, 2014; Pettit et al., 1999). Also assigned to this category of studies are those which employ measures that either ask about involvement in unstructured activity, but not explicitly about whether peers are present ('How often do you hang out in the local neighborhood?', 'How often do you go to amusement arcades?' from Smith and Ecob, 2013), or that ask about time spent with friends, but not about the kind of activity ('How many times in the past week did you just hang out with friends?' from Augustyn and McGloin, 2013). Some of the operationalizations in this category included items about going to bars and nightclubs (e.g., Bernburg and Thorlindsson, 2001; Miller, 2013). These items were explicitly rejected by Osgood et al. (1996) because such activities are closely associated with alcohol use and because visiting nightclubs is often prohibited for kids in early and middle adolescence. Those activities would, therefore, be deviant in themselves, which makes an established relationship with delinquency tautological.

The second approach to measuring unstructured socializing explicitly captures all three conditions articulated by Osgood et al. (1996), by asking respondents in questionnaire-format about their exposure to certain situations. Several studies (Greene and Banerjee, 2009; Higgins and Jennings, 2010; Müller, Eisner, and Ribeaud, 2013; Osgood and Anderson, 2005; Thomas and McGloin, 2013, measure from G.R.E.A.T. data) have employed measures such as the following: 'How many hours per week do you spend hanging out with friends, not doing anything in particular, where no adults are present?' This type of measurement leaves little room for ambiguity

when respondents are trying to interpret what the item specifically refers to. Such operationalizations clearly possess greater face validity as indicators of unstructured socializing than those falling under the first approach discussed above.

A third, but relatively scarce approach to measuring unstructured socializing relies on the use of time diary data (Bernasco et al., 2013b; Janssen et al., 2015; Posner and Vandell, 1999; Riley, 1987; Weerman et al., 2013; Wikström and Butterworth, 2006; Wikström et al., 2010; Wikström et al., 2012a⁴). Time diaries systematically record respondents' allocation of time over activities by questioning respondents about daily activities in small time units (e.g., ten minutes or one hour), where the activities took place, and who else was present during each activity. The information gleaned from these instruments can be applied to specify respondents' exposure to very specific situations; they can combine information about the activity (whether it was structured or unstructured) with information about whether peers were present and whether parents or other adults were present. Thus, studies based on the use of time diaries enable a detailed and accurate operationalization of unstructured socializing.

Mediation of the relationship

Identifying mediating factors would enhance our understanding about why involvement in unstructured socializing increases delinquency and substance use, which is why one of the aims of the systematic literature review was to explore relevant mediators. The review showed that, although a few studies had indeed investigated mediation of the unstructured socializing-delinquency/substance use relationship (Agnew and Petersen, 1989; Bernasco et al., 2013b; Bernburg and Thorlindsson, 2001; Boman, 2013; Greene and Banerjee, 2009; Hawdon, 1996; Hughes and Short, 2014; Regnerus, 2002; Riley, 1987; Wong, 2005), these studies generally did not scrutinize the effects of separate variables. Instead, these studies added several variables to models simultaneously, making it difficult to identify unique mediating effects. For example, Bernburg and Thorlindsson (2001)

4 Lam, McHale, and Crouter (2014) and Pettit et al. (1999) also applied time diary data but did not specify whether activities were unstructured.

found that the effect of routine activities (unstructured peer interaction) on property offending and violent behavior decreased, but remained significant, once ‘deviant peers’ and ‘definitions favorable to offending’ were added to the model. Studies that did distinguish between independent indirect effects, found that association with deviant friends (Boman, 2013; Greene and Banerjee, 2009; Wong, 2005), alcohol use (Bernasco et al., 2013b), peer group commitment (Riley, 1987), and provocative social interactions (‘signifying’: Hughes and Short, 2014) offered potential explanations for why involvement in unstructured socializing is related to delinquency.

Moderation of the relationship

To explore what factors might amplify or diminish the unstructured socializing-delinquency relationship, I searched for studies that examined potential moderating factors and situations. Results of the review are summarized in Table 1.3 and will be briefly discussed in this section.

First, researchers have focused attention on the potential interaction between unstructured socializing and *individual traits*. For example, multiple studies have investigated whether unstructured socializing interacts with self-control or closely related concepts. In this regard, the evidence supporting an interactive effect is weak and often mixed. Most studies that have investigated self-control or impulsivity did not find a significant interaction with unstructured socializing in predicting delinquency (LaGrange and Silverman, 1999; Maimon and Browning, 2010; Thomas and McGloin, 2013). Still, some studies offer partial support for moderation. For example, LaGrange and Silverman (1999) found positive interactions between risk-seeking and unstructured socializing when predicting violence but not for property offenses and drug offenses. They also reported null findings for moderation by most of the other indicators for self-control (temper, carelessness, present oriented), although they did find that ‘carelessness’ interacted with ‘time spent driving around with friends’ in their effect on drug offenses. The study of Hay and Forrest (2008) provides somewhat more convincing, but nevertheless mixed, evidence for the interaction between unstructured socializing and self-control in predicting general crime. Other individual traits have also been examined as potential moderators of the association between unstructured socializing and delinquency. Among these

studies, support has been found for an amplifying effect of unstructured socializing on delinquency among individuals holding definitions more favorable to delinquency (Bernburg and Thorlindsson, 2001) and for a diminishing effect of unstructured socializing on delinquency among individuals scoring higher on composite scales of morality and self-control (Wikström and Butterworth, 2006; Wikström et al., 2010; Wikström et al., 2012a).

Second, studies were concerned with the potential interaction between unstructured socializing on the one hand and community characteristics and individual *background variables connoted with disadvantage* on the other hand. With regard to community characteristics, unstructured socializing was found to be more strongly related to delinquency among adolescents enrolled in schools with higher levels of instability (i.e., residential mobility and family disruption; Bernburg and Thorlindsson, 2007); more strongly related to violence among adolescents who reside in neighborhoods with lower levels of collective efficacy (Maimon, 2009; Maimon and Browning, 2010); and more strongly related to externalizing behavior for adolescents who reside in neighborhoods that were rated as unsafe (Gage et al., 2005; Pettit et al., 1999). On the other hand, Anderson (2003) did not find interactions with density and dilapidation in the residential neighborhood. Other investigated background characteristics seem to be of less relevance to the unstructured socializing-delinquency relationship: There is limited evidence that the unstructured socializing-delinquency relationship is moderated by immigrant generational status (DiPietro and McGloin, 2012) and no evidence that the relationship is moderated by socioeconomic status (Barnes et al., 2007).

Table 1.3. Moderation of the relationship between unstructured socializing and delinquency/substance use ($N = 74$ publications)

	Research projects	Studies	Yes ^a	No ^a
Crime propensity	2.0	3.0	3.0	.0
Attitudes/beliefs	1.0	1.0	1.0	.0
Self-control/impulsivity	6.0	7.0	2.0	5.0
Risk taking	1.0	3.0	2.0	1.0
Temper	1.0	2.0	.0	2.0
Carelessness	1.0	2.0	1.0	1.0
Present oriented	1.0	2.0	.0	2.0
Disadvantaged background				
Structural community characteristics	2.0	4.0	1.0	3.0
Cultural community characteristics	3.0	4.0	4.0	.0
Safe/unsafe neighborhood	2.0	2.0	2.0	.0
Immigrant generational status	1.0	1.0	.0	1.0
Socioeconomic status	3.0	8.0	2.0	6.0
Social bonds				
Peers				
Peers' deviant behavior	7.0	9.0	7.0	2.0
Peers' attitudes	1.0	1.0	1.0	.0
Peer group gender composition	1.0	1.0	1.0	.0
Parents				
Time with parents	1.0	2.0	.0	2.0
Parent-child relationship	4.0	4.0	3.0	1.0
Parental monitoring	2.0	2.0	2.0	.0
Parental involvement in school	1.0	1.0	1.0	.0
School				
School bond	1.0	1.0	1.0	.0
Situational conditions				
Functional locations	2.0	2.0	2.0	.0
Collective efficacy in the area	1.0	1.0	1.0	.0
Evening/during the day	1.0	1.0	1.0	.0
Other				
Family strain	1.0	1.0	1.0	.0
School strain	1.0	1.0	1.0	.0
Extracurricular activity	1.0	1.0	1.0	.0

NOTES: Several studies incorporated more than one dependent variable or investigated more than one moderator. The number of publications, therefore, does not match the number of studies discussed in this Table. The numbers in the 'studies' column refer to the number of papers in which this variable was discussed as moderator, the numbers in the 'research projects' column correspond to the number of different data collections on which these papers were based.

^aThe numbers in the 'yes' column refer to the number of studies that found this variable to moderate the relationship, the numbers in the 'no' column refer to the number of studies that did not find this variable to moderate the relationship.

Third, several studies have examined whether the effect of unstructured socializing on delinquency is moderated by *peer variables*, particularly peer delinquency. Findings have been mixed. Some studies have found that peer delinquency amplifies the effect of unstructured socializing on delinquency (Bernburg and Thorlindsson, 2001; Sentse et al., 2010; Svensson and Oberwittler, 2010; Wikström et al., 2012a) and substance use (Thorlindsson and Bernburg, 2006), whereas other did not find support for an interactive effect (Agnew, 1991; Haynie and Osgood, 2005) or found a diminishing effect (McGloin and Shermer, 2009). Relatedly, Thorlindsson and Bernburg (2006) found that the unstructured socializing-substance use relationship was amplified for adolescents who thought their peers would respond positively to substance use. The studies that found interaction effects generally did not take into account the skewed distribution of dependent variables. Also, these studies did not examine the friends with whom adolescents engaged in unstructured socializing, but instead looked into general reports about peers' delinquency or attitudes. One exception is the study of Lam, McHale, and Crouter (2014). They found that unstructured socializing was only significantly related to problem behavior if it occurred in context of a mixed-sex peer group but not if it occurred in the context of a same-sex peer group.

Fourth, researchers have focused on how *parenting-related variables* moderate the effect of unstructured socializing on delinquency. For example, Bernburg and Thorlindsson (2001) found that the effect of unstructured peer interaction on violence and property offending was weaker for adolescents who had a stronger bond with their parents. These same researchers later reported that the influence of unstructured socializing was diminished for adolescents whose parents knew their friends and the parents of their friends (Bernburg and Thorlindsson, 2007). Similarly, studies have found that the relationship between unstructured socializing and delinquency was diminished among adolescents who experience greater parental acceptance (Galambos and Maggs, 1991), who find it easy to talk to their parents about bothersome issues (Gage et al., 2005), whose parents are involved with school (Gage et al., 2005), and who experience more parental monitoring (Galambos and Maggs, 1991; Pettit et al., 1999). On the other hand, some studies report null findings with regard to moderation between unstructured socializing and family-related variables. Specifically, Barnes et al. (2007) found no evidence that the effect of unstructured socializing on delinquency

and substance use was moderated by time spent with parents. Likewise, Galambos and Maggs (1991) reported null findings for the potential interaction between unstructured socializing and parent-child conflict.

Fifth, *situational conditions* have been found that strengthen or weaken the unstructured socializing-delinquency relationship, although this line of research is still in an early stage; only a few publications have appeared on this topic in the past years. In particular, Weerman et al. (2013) found that time spent with peers was only related to delinquency when it was combined with at least two of the following conditions: Just socializing, being in public, and being unsupervised. This provides some support that public location is a moderating factor. Relatedly, Wikström et al. (2012a) found that crime rates per 1000 person-hours were higher for unstructured peer-oriented activities in local centers than in city centers and higher on the streets and in parks than while 'moving around'. They also found that crime rates per 1000 person-hours were higher for unstructured peer-oriented activities in areas with medium levels of collective efficacy than in other areas. Additionally, Wikström et al. (2012a) found that the reported crime rates per 1000 person-hours were higher for unstructured peer-oriented activities during the evenings as opposed to the middle of the day.

Finally, *other variables* that have been studied as potential moderators of the unstructured socializing-delinquency relationship are school bonds, extracurricular activities, and experienced strain. With regard to school bonds, Bernburg and Thorlindsson (2001) found that the influence of unstructured socializing on violence and property offending was diminished for adolescents with stronger bonding to school. With regard to extracurricular activity, Gage et al. (2005) found that the association between unstructured socializing and problem behavior was stronger for girls who spent less than one day a week in extracurricular activities. With regard to experienced strain, Op de Beeck and Pauwels (2010) found that the links between family strain (e.g., divorce), school strain (e.g., poor study results, repeating a grade), and offending were stronger for youths who were not involved in unstructured socializing, findings that contradicted their expectations.

Limitations of existing literature

The conducted systematic literature review suggested that the unstructured socializing-delinquency relationship is fairly robust across research designs, countries, types of delinquency, stages of adolescence, and urban background of respondents. Nevertheless, it also showed that our understanding of the relationship is in need of further investigation on at least three matters. First of all, there is room for improvement of the operationalization of the concept of unstructured socializing. Most studies did not explicitly measure all three conditions of the concept (presence of peers, absence of authority figures, and unstructured activity), which hampers the interpretation of their findings with regard to the unstructured socializing-delinquency relationship. Specifically, as Osgood et al. (1996) mentioned, the current operationalizations should be improved by expanding the list of unstructured activities and by better specifying whether authority figures are present.

Second, the research on mediation of the relationship is scarce and as such, we know little about factors that might explain why involvement in unstructured socializing is related to adolescent delinquency. It is particularly necessary to further investigate the independent contribution of different mediators. Previous studies generally did not examine the mediating factors separately, which makes it difficult to determine what factors are most relevant in explaining the relationship.

Finally, although there have been several studies that investigated *moderation* of the unstructured socializing-delinquency relationship, our understanding of *situational* moderators is still rudimentary. For example, we know little about the extent to which it matters, in regard to their risk of delinquency, *where* adolescents spend their time in unstructured socializing, or *with whom* they are engaged in those activities. The current study aims at addressing each of these limitations.

Current study

Particularly, the aim of the current study is to theoretically, methodologically, and empirically elaborate on the relationship between unstructured socializing and adolescent delinquency. In doing so, the study will contribute

to the existing literature in at least three important ways. First, the study will *examine the underlying processes* that explain the unstructured socializing-delinquency relationship. As we have seen previously, not many studies have identified independent mediators for the relationship. Second, the study will expand on research about moderation and *specify situational conditions that strengthen and weaken the relationship*. Thus, the study will scrutinize under what conditions unstructured socializing is, and is not, related to adolescent delinquency. These first two objectives are addressed by integrating, and thereby theoretically elaborating on, the unstructured socializing perspective with a variety of other theoretical perspectives, such as social learning theory (Chapter 2), situational peer influence approaches (Chapters 2 and 7), the responsibilities of places classification (Chapter 5), social disorganization theory, and broken window theory (both Chapter 6).

Third, this study *improves the operationalization of unstructured socializing* and more specified versions of criminogenic behavior settings by applying a time diary method. This method enables me to accurately define and measure the activities, people present, and locations within the concept, thereby allowing an empirically better test for the unstructured socializing perspective. Furthermore, the study combines the time diary data with data derived from other methods (such as systematic social observation and community surveys) to measure characteristics of the broader context in which unstructured socializing takes place. Two methods are discussed in detail: The space-time budget method (Chapter 3) and systematic social observation (Chapter 4).

Data and methods

Data were used from the NSCR Study of Peers Activities and Neighborhoods (SPAN). The SPAN project is a longitudinal study of adolescents, developed to gain more insight into the associations between delinquency, daily activity patterns, personal traits (such as self-control and morality), and bonds of adolescents with their peers, parents, school, and neighborhood. The SPAN data are exceptionally suitable for answering my research questions because they include time diary data (from now on referred to as space-time budget data) that allow for an improved operationalization of unstructured

socializing. Furthermore, the SPAN data incorporate several other data sources that can be combined with the space-time budget information, such as questionnaires on adolescents' self-reported involvement in delinquency and community surveys and systematic social observations on characteristics of the areas in which adolescents spend their time in unstructured socializing.

Sample

For the SPAN data collection, 40 secondary schools in the city of The Hague and surrounding municipalities (the Netherlands) were approached, of which ten schools participated. Primary reasons for declining participation were that schools were already engaged in other research projects, or had concerns about disturbing lessons. In the ten participating secondary schools, all first graders (aged 12 to 13 years) and fourth graders (aged 15 to 16 years) were asked to join the study. The study thus incorporated two age cohorts. Students were offered vouchers for the movies if they participated, and they could participate during school hours. Parents were informed about the study and could refuse participation. Of the 942 adolescents who were initially approached, 843 participated in the study during the first wave of the data collection (in the school year 2008-2009)⁵. A second wave of data collection was conducted two years later (school year 2010-2011), in which 615 of the respondents participated again (a response rate of 73 percent). Main reasons for attrition were a lack of time or willingness to participate. The dropout rate was higher among the respondents from the older age cohort, as most of these had to participate outside of school hours. Dropouts were also slightly more often involved in unstructured socializing, but they did not differ significantly from the participants in their self-reported delinquency.

For most of the studies described in this book, those 615 respondents were included who participated in both waves of the data collection. This two-wave sample consists of approximately 53 percent boys and 47 percent girls. As the dropout rate was somewhat higher among the older respondents, the two-wave sample consists of slightly more respondents from the youngest age cohort (57 percent) than the older age cohort (43 percent). The mean

5 Of the 942 adolescents who were approached, 2.9 percent could not be reached, 1.6 percent was withdrawn from the study by parents, 1.3 percent did not show up at the appointment, 0.6 percent had moved, and 0.3 percent was ill at the time of the data collection (Bernasco et al., 2013b).

age was 14.4 years in the first wave and 16.5 years in the second. The data collection covered several months, and the time-lag between the two waves, therefore, differed for the respondents. For most of the respondents (99.4 percent), the time-lag was between 1.6 and 2.6 years. The SPAN sample is over representative for adolescents from a non-Dutch background and for respondents from lower forms of education. Of the entire sample, 45 percent of the respondents were from non-native Dutch descent, following the definition of Statistics Netherlands (stating that a person is from native Dutch descent if both of his or her parents are born in the Netherlands); 9 percent of the respondents had a Turkish background; 7 percent a Moroccan background; 7 percent were Surinamese; and 22 percent were from another ethnic background. A relatively large portion of the sample was engaged in lower forms of secondary education at the time of the first interview: 18 percent were engaged in the lowest level (Dutch: *praktijkschool*); 48 percent were engaged in preparatory secondary education (Dutch: *VMBO*); 11 percent were engaged in a medium level of education (Dutch: *HAVO*); and 24 percent were engaged in pre-academic education (Dutch: *VWO*). Furthermore, as the data collection took place in the city and surroundings of The Hague, the third largest city in the Netherlands with 486,000 inhabitants in 2009, most of the respondents lived in a highly urbanized region. Of all respondents, 93.6 percent lived in a 'very strongly urban' or 'strongly urban' neighborhood, as classified by Statistics Netherlands. The sample was, therefore, not representative of Dutch youth but varied in ethnicity and had a focus on lower educated adolescents from a highly urbanized area in the Netherlands.

Space-time budget data

The *space-time budget instrument*, as proposed by P-O. Wikström (Wikström and Butterworth, 2006; Wikström et al., 2010; Wikström et al., 2012a), was piloted in the Peterborough Youth Study (PYS) and further refined in the Peterborough Adolescent and Young Adult Development Study (PADS+). The instrument applies a time diary method in which respondents are questioned retrospectively about their hourly activities and whereabouts in four days prior to the interview, including one Friday, one Saturday, and two other recent weekdays. The respondents were asked, per hour, about the

nature of their activities, who else was present (e.g., friends, siblings or other peers, parents or other adults), and the functional and geographical location of these activities. The space-time budget interviews were conducted in face-to-face conversations between one research assistant and one respondent.

The space-time budget data are applied to operationalize involvement in unstructured socializing. As mentioned earlier, the time diary method is a scarcely applied, but increasingly popular, method that enables the explicit measurement of all three conditions of unstructured socializing (presence of peers, absence of authority figures, unstructured activity) and thereby allows for a more accurate operationalization of the concept. The current study thereby improves upon previous studies on the unstructured socializing-delinquency relationship by allowing for a better empirical test. The method further captured the whereabouts of respondents per hour on a detailed geographical level and also measured the function of those locations (e.g., at home, at school, on a street corner). This information allows for specification of the unstructured socializing-delinquency relationship by location. Appendix A provides a list of the activities that were included as ‘unstructured’ and lists of peers, family members, and other adults that were used to specify whether peers and authority figures were present in the situation.

Compatible data sources

Apart from the space-time budgets, the SPAN data also incorporated information of regular questionnaires derived from the respondents. The questionnaire mirrored the instrument developed for the Peterborough Adolescent and Young Adult Development Study of Wikström et al. (2012a), except that it was translated to Dutch and extended with scales on peer reinforcement and parental monitoring. In these questionnaires, the respondents were asked about a wide range of topics, including their involvement in delinquency, their attitudes toward delinquency, their level of self-control, and their relationship with peers, parents, and school. They completed the questionnaires, in written form, themselves, under supervision of a research assistant. Data from these questionnaires was used to operationalize adolescents’ involvement in delinquent behaviors. Respondents were asked whether and how often they had engaged in 20

specific offenses over the past year (e.g., threatening someone, stealing something worth more than five Euros, damaging things that belonged to someone else).

The information on the whereabouts of the adolescents derived with the space-time budget interview was compatible with information from several data sources, all incorporated in the SPAN data: Systematic social observations of, for example, signs of physical and social disorder, community surveys among residents of The Hague, and census data on, for example, the average socioeconomic status in neighborhoods. *Systematic social observations* were conducted at 1422 street segments of 100 meters, distributed across the city and surroundings of The Hague. The *community surveys* were held among 3575 residents of The Hague. These surveys were based on a similar instrument in the Peterborough Adolescent and Young Adult Development Study of Wikström et al. (2012a) and questioned, for example, about the social cohesion and informal control that the residents experienced in their neighborhood. *Census data* of the local government of The Hague was publicly available from municipal databases. Census data used for this study contained information about population density, socioeconomic status, residential mobility, family disruption, high-rise buildings, and ethnic heterogeneity in neighborhoods of The Hague.

PROSPER data

For one of the studies in this book (discussed in Chapter 7), I relied on data from the PROSPER Peers project (Promoting School-Community-University Partnership to Enhance Resilience). This project collected social network data on how often respondents spent time in unstructured socializing with their nominated friends, which offered unique information about characteristics of the friends with whom adolescents were *actually* engaged in unstructured socializing. Such information was not available in the SPAN data. The data collection for the PROSPER project took place in 28 rural public school districts in Iowa and Pennsylvania (USA). Information was used from the first five waves of the data collection (collected between 2002 and 2007) that included 16,284 respondents (aged 10 to 17). The PROSPER sample differs in several aspects from the SPAN sample, amongst other things because the respondents predominantly had a rural backgrounds (as opposed to the SPAN

respondents who lived in highly urbanized areas) and were mostly Caucasian. As these data were used for only one of the studies in this book, the interested reader is referred to Chapter 7 for a more thorough description.

Outline of chapters

The aim of the current study is to elaborate on the relationship between unstructured socializing and adolescent delinquency. Objectives of the study are 1) to explain the unstructured socializing-delinquency relationship by examining underlying processes, 2) to improve upon previous operationalizations of the concept of unstructured socializing by exploring promising methods of measurement, and 3) to specify situational conditions that strengthen and weaken the unstructured socializing-delinquency relationship. Each of these objectives is addressed in one part of the book.

Part I. Unstructured socializing and delinquency

To address the first objective, a theoretical model that scrutinizes four processes that potentially explain the unstructured socializing-delinquency relationship is proposed and empirically tested. It is argued that involvement in unstructured socializing 1) exposes adolescents to opportunities (temptations and provocations) for delinquency; 2) exposes adolescents to group processes that may result in delinquency (delinquent reinforcement and peer influence toward conformity); 3) alters adolescents' moral values toward delinquency-favorable attitudes; and 4) exposes adolescents to delinquent peers. In addition to investigating these processes independently, potential sequential effects are also considered. Particularly, three causal chains are examined: An indirect effect of exposure to delinquent peers through group processes, an indirect effect of exposure to delinquent peers through increased delinquency-tolerance, and an indirect effect of group processes through increased delinquency-tolerance. The study goes beyond existing studies by investigating the proposed processes independently, by expanding the set of explanatory processes with the inclusion of group processes and opportunity, and by considering potential sequential effects. The specifics and results of the study are discussed in Chapter 2.

Part II. Measuring the setting of unstructured socializing

The second objective is addressed in Chapters 3 and 4 by investigating the strengths and weaknesses of two methods that have been previously proposed for the operationalization of aspects of behavior settings. The first method, discussed in Chapter 3, is the *space-time budget method* (STB), proposed by P-O. Wikström (Wikström and Butterworth, 2006; Wikström et al., 2010; Wikström et al., 2012), to better capture individuals' activity patterns. The space-time budget method is an instrument to record, retrospectively, the hourly whereabouts and activities of respondents. The method is largely based on traditional time diary methods, except that it also incorporates spatial information about the locations where activities took place and information about criminologically relevant events, such as delinquency and victimization. Chapter 3 addresses, among other things, the methods' historical context, how the method should be applied, strengths and weaknesses, applications in criminology, and results of validation analyses.

The second method, discussed in Chapter 4, is *systematic social observation* (SSO), proposed by Taylor, Perkins, and colleagues (Perkins, Meeks, and Taylor, 1992; Perkins and Taylor, 1996; Taylor, Gottfredson, and Brower, 1984) to measure features of the physical environment that can be related to delinquency, particularly signs of disorder within street blocks. Systematic social observation refers to observations that are conducted systematically, in the current study by completing a checklist on disorder items and by providing detailed procedures on the unit (e.g., street segments), topic, duration, and recording of the observation (Reiss, 1971). The SSO method has a longer history in criminology than the STB method and many of the methodological issues have already been addressed. However, observer reliability issues in SSO studies have not received much attention, especially not in ecological assessments (Sampson and Raudenbush, 1999). This study, as discussed in Chapter 4, explores whether SSO enables valid and reliable measurement of disorder at both street segment level and neighborhood level. A new model is proposed that directly controls for observer bias in ecometric measures.

Part III. Beyond unstructured socializing: Specifying criminogenic behavior settings

The third objective is addressed by applying the STB method and SSO method in combination with more traditional methods, to investigate three situational conditions that potentially affect the unstructured socializing-delinquency relationship: The functional location, disadvantage in the area, and characteristics of the present peers. These conditions are each addressed in a separate chapter.

Functional location refers to the public nature and function of a location (e.g., private, semi-public, and public locations). To better understand in what types of locations unstructured socializing is most crime conducive, the unstructured socializing perspective is integrated with the responsibilities of places classification of Felson (1995). This classification contains the idea that people's tendency to intervene in a situation depends on the experienced responsibility. Experienced responsibility will be strongest in private spaces and least strong in public spaces. Therefore, it is hypothesized that unstructured socializing is most strongly related to delinquency in public locations and least strongly in private locations. This idea is further investigated for specific locations: Public entertainment facilities, public transportation and other semi-public settings (the categories within the semi-public realm), and streets, shopping centers, and open spaces (as categories within the public realm). This study is the first to investigate a wide of variety of functional locations for unstructured socializing in relation to adolescent delinquency. Results of the study are discussed in Chapter 5.

The role of *areal disadvantage* in the unstructured socializing-delinquency relationship is theorized against the background of social disorganization theory (Sampson, Raudenbush, and Earls, 1997; Shaw and McKay, 1942) and broken windows theory (Wilson and Kelling, 1982). It is hypothesized that disorganization and disorder in the neighborhoods where adolescents spend their time in unstructured socializing strengthen the relationship between unstructured socializing and delinquency. The study considers several indicators of social disorganization and disorder (socioeconomic status, ethnic heterogeneity, residential mobility, family disruption, population density, structural density, collective efficacy, and physical disorder). The study contributes to previous studies by also investigating disadvantage in the

neighborhoods where adolescents *spend their time*, whereas previous studies were mainly considered with disadvantage in *residential* neighborhoods. Specifics and results of this study are discussed in Chapter 6.

The last empirical chapter is concerned with identifying *characteristics of the friends* with whom adolescents are engaged in unstructured socializing that contribute to a deviance conducive environment. The unstructured socializing perspective is integrated theoretically with literature on peer influence and co-offending. Four characteristics are investigated: Friends' involvement in type-specific delinquency, friends' risk-seeking tendencies, friends' attitudes toward rule breaking, and age differences between friends and the target adolescents. This study is innovative in that it employs social network data combined with information on the time that respondents reported spending hanging out with their nominated friends (collected in the PROSPER Peers project). It thereby enables the study of characteristics of friends with whom adolescents are *actually* engaged in unstructured socializing, whereas previous studies examined general reports about peer delinquency. This study is discussed in Chapter 7.

Finally, the conclusion in Chapter 8 provides a summary of the findings and their main implications for theory, methodology, and policy. This chapter also addresses limitations of the study and suggestions for further research. A schematic overview of the book is provided in Table 1.4.

Table 1.4. Overview of book chapters

Chapter	Aim of study	Data
Part I. Unstructured socializing and delinquency		
1	Providing a theoretical and empirical context	Literature review
2	Explaining the relationship a) Exposure to opportunities b) Exposure to group processes c) Increased tolerance toward delinquency d) Exposure to delinquent peers	SPAN STB and questionnaire
Part II. Measuring the setting of unstructured socializing		
3	Methodological chapter on space-time budget method	SPAN STB and questionnaire
4	Methodological chapter on systematic social observation	SPAN SSO disorder data
Part III. Beyond unstructured socializing		
5	Specifying the relationship with functional location a) Private spaces b) Semi-public spaces c) Public spaces	SPAN STB and questionnaire
6	Specifying the relationship with disadvantage in the area a) Disorganization b) Disorder	SPAN STB, questionnaire, SSO disorder data, community surveys, census data
7	Specifying the relationship with characteristics of the present friends a) Friends' delinquency b) Friends' risk-seeking c) Friends' attitudes d) Age difference between friend and respondent	PROSPER questionnaire
8	Discussion and conclusion	

ABBREVIATIONS: SPAN = Study of Peers Activities and Neighborhoods; STB = space-time budget interviews; SSO = systematic social observations; PROSPER = Project for Promoting School-Community-University Partnership to Enhance Resilience.



Chapter Two.

Explaining the Relationship

Hoeben, Evelien M., and Frank M. Weerman. 2016.

Why is involvement in unstructured socializing related to adolescent delinquency?

A revised version of this chapter is accepted for publication in Criminology.



Explaining the Relationship

Deviant behavior may add excitement to an otherwise uneventful situation – James Hawdon

Research on lifestyles, leisure and routine activity patterns repeatedly showed that adolescents' involvement in certain activities leads to higher risks for involvement in delinquency (Anderson, 2013; Felson and Boba, 2010; Wikström et al., 2012a). Not many studies, however, have investigated the underlying processes in this relationship. The current study aims to empirically compare potential explanatory processes, focused on one particular leisure pattern that has often been associated with adolescent delinquency: Involvement in unstructured socializing.

The term 'unstructured socializing' was coined by Osgood et al. (1996). They proposed that activities with three key features are particularly associated with higher levels of deviancy: Activities with a lack of structure, where peers are present and where authority figures are absent. Unstructured socializing describes a situation that is characterized by these three conditions. Only if all of these three conditions are present, one can speak of 'unstructured socializing'. Osgood et al. (1996) found, with fixed effects panel models over five waves of data, that the routine activities they classified as 'unstructured socializing' (riding around in a car for fun, getting together with friends informally, going to parties, spending evenings out for fun and recreation) were each positively related to within-individual changes in at least three out of five types of deviant behavior (criminal behavior, heavy alcohol use, marijuana use, other drugs use and dangerous driving). Later empirical studies, cross-sectional as well as longitudinal, have confirmed the findings of Osgood and colleagues that individuals who spend more time in 'unstructured socializing' had higher delinquency rates (e.g., Bernburg and Thorlindsson, 2001; Haynie and Osgood, 2005; Maimon and Browning, 2010).

The establishment of a robust relationship between involvement in unstructured socializing and delinquency calls for a theoretical and empirical elaboration of the underlying processes for this relationship. Why do adolescents who spend a lot of their time unstructured socializing have an increased risk of becoming involved in delinquency? Or, to use popular terminology: Why does ‘hanging around with peers’ lead to more delinquency? A few scholars have suggested processes that might be at play (e.g., Agnew and Petersen, 1989; Mahoney and Stattin, 2000; Osgood et al., 1996; Siennick and Osgood, 2012), but we are unaware of any study that *empirically compared* relevant processes to explain the relationship.

The current study distinguishes and empirically investigates four possible processes to explain the relationship between involvement in unstructured socializing and delinquency and thereby integrates the unstructured socializing perspective with insights from social learning theory and other perspectives on peer influence. The study further looks into sequential effects that specify ‘chains’ of the proposed processes. Data were collected among 610 adolescents (age 11 to 20) in The Hague, the third largest city of the Netherlands, with a space-time budget interview and a questionnaire. The space-time budget interview was developed to map the hourly activities and whereabouts of adolescents (Wikström and Butterworth, 2006; Wikström et al., 2012a) and enabled an accurate operationalization of ‘unstructured socializing.’ The questionnaire obtained information about self-reported delinquency, perceived temptations and provocations, perceived peer pressure, moral attitudes and delinquency of peers. The research question we address is: *Which of the four processes* (exposure to opportunities for delinquency; exposure to group processes; increased tolerance toward delinquency; and exposure to delinquent peers) *contribute to explaining the relationship between involvement in unstructured socializing and adolescent delinquency?*

A particular problem in answering this question is the possibility of selection effects. If adolescents with a propensity to offend prefer unstructured socializing over other activities in the first place, we are not able to distinguish this selection from the influence of unstructured socializing on delinquency. To account for this, we conducted multilevel-path models that address differences *between* individuals, but also *within*-individual changes over time, which control for stable individual characteristics. The latter analysis provides a more stringent test.

Explanatory processes

The concept of ‘unstructured socializing’ has its roots in lifestyle theory (Hindelang, Gottfredson, and Garofalo, 1978) and routine activity theory (Cohen and Felson, 1979), which were designed to explain macro-level patterns of crime. Osgood et al. (1996) translated concepts from these theories (in particular routine activity theory) to an individual level. According to Osgood et al., presence of peers stimulates deviance because peers make deviancy *rewarding* by forming an approving audience and because peers make deviancy *easier* by serving as resources (for example by offering practical assistance as ‘look-outs’). Absence of authority figures stimulates deviance, because it implies a lack of social control. Unstructured activities are more conducive to deviance than structured activities, because unstructured activities are not likely “to place (...) individuals in roles that make them responsible for social control” and because unstructured activities offer more opportunities for deviance, since less time is spent in “designated ways” (Osgood et al., 1996: 640-41).

The original formulation of the unstructured socializing-deviance relationship by Osgood et al. (1996) *implicitly suggests* two explanatory processes. First, Osgood and colleagues noted that unstructured activities leave time for involvement in deviant behavior (more than structured activities do) and that absence of authority figures reduces the risk of getting caught. We interpret both consequences of unstructured socializing as ‘opportunity’ processes. Second, Osgood and colleagues signaled that the presence of peers makes deviancy rewarding in terms of status and reputation, thereby offering situational inducements. We interpret this as a ‘reinforcement’ or group process. Apart from these two main processes that were implicitly assumed by Osgood et al. (1996), other explanatory processes are also possible. From the literature, we derive two other processes that may explain the association between exposure to unstructured socializing and adolescent delinquency: Increased tolerance toward delinquency and exposure to delinquent peers. All four processes will be addressed and elaborated theoretically in the remainder of this section.

Exposure to opportunities for delinquency

As mentioned, the *first process* to explain the unstructured socializing-delinquency relationship is that involvement in unstructured socializing exposes adolescents to opportunities for delinquency. Several empirical studies have associated opportunities with delinquency: Overviews are given by Miethe and Meier (1994), Pratt and Cullen (2005), and Spano and Freilich (2009). Osgood et al. (1996) argued, based on routine activity theory (Cohen and Felson, 1979; Felson and Boba, 2010) and Matza and Sykes' (1961) conception of subterranean values, that most adolescents are open to the idea of deviance and are thereby *motivated offenders*. In a situation of unstructured socializing, there are no adults present to supervise their behavior, so there are *no capable authority figures*⁶. Moreover, the unstructured nature of the activity enables involvement in delinquency (Osgood et al., 1996). In line with this reasoning, Wikström (2004; Wikström and Sampson, 2003: 125, 133-34) posited that a lifestyle in which youths spend a significant time 'informally socializing outside the home' and 'unsupervised by adults' is particularly prone to temptations ("perceived options to realize particular desires in an unlawful way") and provocations ("perceived attacks on the person's property, security or respect that generates anger or similar emotional states that may promote unlawful aggressive responses"). Both temptations and provocations imply more opportunities for crime.

Involvement in unstructured socializing has often been used as a proxy for the extent to which individuals encounter opportunities for delinquency or deviancy (e.g., Anderson and Hughes, 2009; Hay and Forrest, 2008; Osgood and Anderson, 2004), but we did not find any empirical studies that explicitly investigated the relationship between unstructured socializing and opportunities for delinquency.

6 We follow the terminology of Osgood et al. (1996: 640) by referring to 'authority figures'. They distantiante from the distinction between handlers, guardians and place managers (Felson, 1995) by generalizing these concepts to the concept of 'authority figure'. An authority figure is "someone whose role in a situation carries a responsibility for attempting to exert social control in response to deviance."

Exposure to group processes

The *second process* to explain the unstructured socializing-delinquency relationship is that involvement in unstructured socializing exposes adolescents to group processes such as delinquent reinforcement and peer influence toward conformity with their group. Osgood et al. (1996) theorized that present peers form an ‘appreciative audience’ for deviance and referred to the situational inducements-perspective of Briar and Piliavin (1965). Briar and Piliavin (1965: 36) considered delinquent acts to be “short-term situationally induced” by desires of adolescents (boys) to, for example, “portray courage in the presence of, or be loyal to peers (...) or simply to ‘get kicks.’” With the exception of the latter, these are social rewards provided by peers that may motivate an adolescent to engage in delinquent behavior.

Findings of experimental research by Dishion and colleagues (e.g., Dishion, Andrews, and Crosby, 1995; Dishion et al., 1996) are in line with these processes. They found that the conversation topics of dyads of thirteen to fourteen year-old boys were affected by their responses to each other: laughter in response to rule breaking topics was likely to evoke more rule breaking talk in delinquent dyads, whereas rule breaking talk was largely ignored in non-delinquent dyads. Although the immediate consequences of rule breaking reinforcement were restricted to *talk* in this experimental setting, laughter and other responses of peers may very well promote *behavior* in real life. Findings of these studies indeed indicated that ‘deviancy training’ (rule breaking topic followed by laugh) in these pre-existing friendship dyads was related to delinquent behavior (Dishion et al., 1996; Dishion et al., 1997), although these relations were longitudinally determined and not situational.

Conformity, or (perceived) pressure to behave in accordance with the rest of the group, may lead to delinquency even if the majority of a group of adolescents does not have delinquent intentions. Warr (1996) found that most group offenses were instigated by one peer. He argued that ‘fear of ridicule’ and ‘loyalty’ act as “magnifying mechanisms [that] transform the behavior of one (or a few) into the behavior of many” (Warr, 2002: 55). Similarly, psychologists argue that individuals comply to behavior they do not necessarily approve of, because of their ‘need to be liked’ and their ‘tendency to avoid rejection’ (Kiesler and Kiesler, 1969). Overviews of empirical studies on peer influence and conformity are given by Brechwald and Prinstein

(2011), Brown et al. (2008), and Hartup (2005). Brown, Clasen, and Eicher (1986) found that 'conformity dispositions' explained ten percent of the variance in self-reported misconduct and fourteen percent of the variance in antisocial behavior. Meldrum, Miller, and Flexon (2013) reported positive relationships between 'susceptibility to peer influence' and delinquency (controlled for prior delinquency), also when they used solely neutral, not antisocial, behavior items to operationalize susceptibility to peer influence.

Exposure to peer group processes may not only affect behavior in a short-term situational manner, but these processes may also have long-term influence on individuals' moral value system. The 'differential reinforcement' element of the social learning theory (Akers, 1998, 2001; Burgess and Akers, 1966) refers to an instrumental learning process where "voluntary actions of the individual," are conditioned through actual and anticipated rewards and punishments (Akers, 2001: 193). Responses from peers are considered to be social rewards that are, over repeated occasions, able to impel the adoption of delinquency-favoring attitudes. The influence of peer reinforcement on behavior can therefore extend beyond the immediate situation. Overviews on social learning theory support the differential reinforcement-deviance relationship (e.g., Akers, 1998: 107-26; Pratt et al., 2010). Also, the studies of Brezina and Piquero (2003) and Rebellon (2006) established that actual or anticipated social reinforcers precede substance use and delinquency in time.

In situations of unstructured socializing, adolescents may experience a positive balance of influences toward delinquency: Parents or other authority figures who are likely to reinforce conventional behavior are absent, whereas 'rewards' for delinquency are possible because of potential supportive responses to delinquent behavior from peers. Exposure to group processes in situations of unstructured socializing may have both short-term and long-term influences on delinquent behavior. Short-term influence occurs when the peer group acts as an 'appreciative audience' and thereby motivates the adolescent to conduct delinquency, or if pressure to conform promotes the participation in delinquent group activities. Long-term influence occurs when reinforcement processes change what the individual perceives as socially rewarding and acceptable behavior.

Empirical support for the association between unstructured socializing and susceptibility to group processes can be found in the study of Flannery, Williams, and Vazsonyi (1999). Their findings indicated that adolescents

who spent their after-school time with friends where adults were not present reported higher susceptibility to peer pressure on antisocial behavior compared to adolescents who spent most of their after-school time at home in presence of a parent or other adult. Steinberg (1986) reported similar results. Brown, Clasen, and Eicher (1986) reported an association between 'peer involvement' (how often respondents, for example, had gone to a party, a movie or concert with friends) and 'conformity dispositions', supporting the relationship between unstructured socializing and peer influence toward conformity as well as the relationship between unstructured socializing and delinquent reinforcement.

Increased tolerance toward delinquency

A *third process* to explain the unstructured socializing-delinquency relationship is that involvement in unstructured socializing increases adolescents' tolerance toward delinquency. This process differs from the process 'exposure to group processes', because it assumes private acceptance (also known as internalization) of attitudes that are acquired from peers, whereas the previous process principally concerns public compliance only; when individuals change their behavior to go along with the group (Kiesler and Kiesler, 1969). The relationship between attitudes and delinquency is found in numerous studies. Meta analyses reported that overall, delinquent adolescents score lower on disapproval of deviance than non-delinquent adolescents (Nelson, Smith, and Dodd, 1990; Stams et al., 2006).

Warr (2002: 65) argued that a group of adolescents may function as 'moral universe' that dictates norms that can be incongruous with conventional norms. A group of adolescents forms its own "ethical reality." During adolescence, young people come to realize that behavioral codes differ between social groups and they come to "appreciate the relativity of standards of conduct". Moral rules are no longer fixed, which may be interpreted as a "license to engage in any conduct." A group of adolescents is therefore able to create a moral code that overrules that of the conventional society, "granting legitimacy to otherwise illegitimate conduct" (Warr, 2002: 67).

Involvement in unstructured socializing may increase the likelihood that adolescents develop their own moral code that differs from the conventional moral code. Increased tolerance toward delinquent behavior is the outcome

of a social learning process, which is dependent on the balance of influences toward delinquency: “A person becomes delinquent because of an excess of definitions favorable to violation of law over definitions unfavorable to violation of law” (Sutherland, 1947: 6-8). This ‘balance of influences’ leans toward delinquency-favoring in settings of unstructured socializing, because people who are likely to reinforce the conventional moral code are absent (the authority figures) and people who are likely to reward a deviant moral code are present (the peers). Indirect evidence for the relationship between unstructured socializing and tolerance toward delinquency is given by the study of Wikström et al. (2010). They found a positive association between time spent awake unsupervised with peers and ‘crime propensity’, a composite score of morality (measured as disapproval of deviance) and self-control. Similar findings were presented in the studies of Pauwels and Svensson (2009; Svensson and Pauwels, 2010).

Exposure to delinquent peers

A *fourth process* to explain the unstructured socializing-delinquency relationship is that involvement in unstructured socializing exposes adolescents to delinquent peers. There is an overwhelming body of empirical literature that indicates a positive relationship between peer delinquency and delinquent behavior. Often cited works in this regard are the studies of Elliott, Huizinga, and Ageton (1985), Haynie (2001), Reed and Rose (1998) and Warr (2002).

Felson (2003) argued that certain settings, ‘offender convergence settings’, increase the chance to meet delinquent others to find potential co-offenders. These settings are very similar to situations of unstructured socializing. ‘Offender convergence settings’ include “1) likely co-offenders, 2) without outside interference, 3) with substantial time available to socialize, size each other up, get drunk, or whatever else leads them down the road of criminal cooperation” (Felson, 2003: 157). In a setting of unstructured socializing, no authority figures are present, which limits the chance of outside interference. The condition that “substantial time [should be] available to socialize” is closely in line with the description of an unstructured activity. This implies that a situation of unstructured socializing is a situation in which adolescents are likely to meet delinquent peers and potential co-offenders.

More generally, unstructured socializing may, compared to other leisure activities, be more likely to expose adolescents to peers with delinquent intentions. Previous studies suggested that involvement in *structured activities* such as team sports, performing arts or academic clubs stimulates association with *conventional* youth (Eccles et al., 2003; Mahoney and Stattin, 2000). Likewise, one might expect that involvement in *unstructured socializing* stimulates association with *delinquent* youth, which may contribute to future involvement in delinquency. Several studies provide empirical support for this association. Studies that reported positive correlations between unstructured socializing and deviant peers are, for example, the studies of Haynie and Osgood (2005), Stoolmiller (1994) and Svensson and Oberwittler (2010). Dishion, Andrews, and Crosby (1995) asked friendship dyads of boys (age 13-14) where they had met and reported a positive association between antisocial behavior of the dyad and ‘met in neighborhood or in an unsupervised community setting’ and a negative association between antisocial behavior of the dyad and ‘met in school or some other organized activity’. Moreover, findings of Boman (2013) indicated mediation of the unstructured socializing-delinquency relationship by delinquent peers. He reported indirect effects of ‘informal multiplexity’ (frequency of time spent in unsupervised contexts with three identified friends) on ‘crime proclivity’ (self-reported crime) through friend deviance, but only during middle adolescence and emerging adulthood and not during late adolescence.

Sequence of processes

The discussed processes may succeed each other in time. For example, when individuals who are often engaged in unstructured socializing make new friends among the delinquent peers they associate with, which subsequently results in more perceived group pressure toward delinquency, which increases their involvement in delinquency. We refer to such a chain of processes as ‘sequential effects’ and incorporate three potential sequential effects in our theoretical model. The theoretical model is displayed in Figure 2.1.

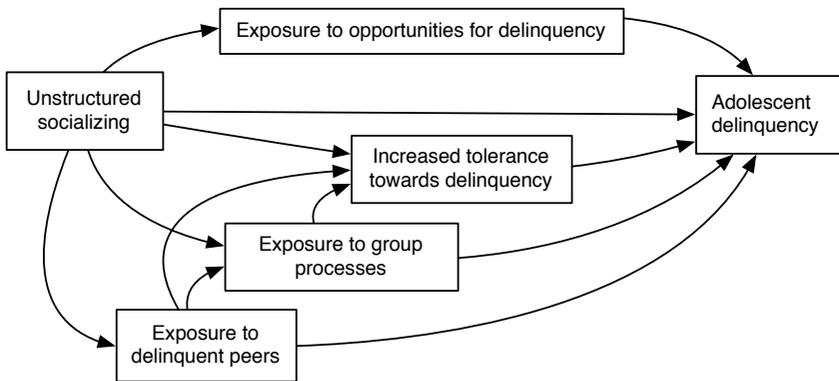


Figure 2.1. Theoretical model: Explaining processes for the relationship between unstructured socializing and adolescent delinquency

Social learning theory specifies several processes through which individuals learn behavior and two of the specified sequential effects may be particularly relevant in explaining the relationship between unstructured socializing and delinquency. First, Akers (2001: 197) argued that “differential association with conforming and nonconforming others” influences the attitudes of an individual and thereby his or her behavior (see also Akers et al., 1979). He thereby specified a causal chain in which (delinquent) associations affect individuals’ (delinquent) attitudes and subsequently affect their delinquent behavior. Earlier empirical investigations did not provide strong evidence for this sequential effect: Megens and Weerman (2012) found that respondents’ attitudes mediated the peer attitudes-respondents’ delinquency relationship, but not the peer behavior-respondents’ delinquency relationship. Similarly, Reed and Rose (1998) found that delinquent associations affected delinquent attitudes, but that this did not subsequently affect delinquent behavior. Reed and Rountree (1997) found mediation based on cross-sectional analyses, but not in analyses on lagged effects. Despite the current lack of evidence, it is worthwhile to explore this sequential effect because it has thus far not been studied in relation to unstructured socializing.

Second, one of the statements of the social learning theory as formulated by Burgess and Akers (1966: 146) indicates that “criminal behavior is a function of norms which are discriminative for criminal behavior, the learning of which takes place when such behavior is more highly reinforced

than noncriminal behavior.” Extrapolating this to the relationship between unstructured socializing and delinquency, this statement implies a sequential effect where involvement in unstructured socializing exposes adolescents to delinquent reinforcement, which affects their tolerance toward delinquency, which ultimately affects their involvement in delinquency.

Further, Reed and Rose (1998: 245) argued, based on the situational inducement perspective of Briar and Piliavin (1965), that adolescents with delinquent friends are more likely to become involved with delinquent behavior, “because they are more likely to find themselves in social situations that contain pressures to commit crime even in the absence of delinquent attitudes.” They referred to this process as ‘situational group pressure.’ This process assumes a causal order in which delinquent behavior is directly affected by delinquent friends through group processes, without an intervening influence on attitudes. Precisely this causal chain was investigated for substance use by Reed and Rountree (1997), but they did not find evidence for it when using a longitudinal model. Trucco, Colder, and Wiczorek (2011), on the other hand, found an indirect effect between peer delinquency and initiation of alcohol use through perceived peer approval toward alcohol use (and peer approval can be interpreted as perceived group pressure). We believe that these subsequent processes may add to the explanation for the unstructured socializing-delinquency relationship.

In summary, we hypothesize, a) that involvement in unstructured socializing exposes adolescents to delinquent peers, which increases their tolerance toward delinquency, which results in delinquency, b) that involvement in unstructured socializing exposes adolescents to group processes, which increases their tolerance toward delinquency, which results in delinquency, and c) that involvement in unstructured socializing exposes adolescents to delinquent peers, which exposes them to group processes, which results in delinquency. The first and second proposed sequential effects refer to long-term effects of unstructured socializing on delinquency that persist beyond the immediate situation by affecting adolescents’ moral value systems. The third proposed sequential effect refers to a short-term effect of unstructured socializing on delinquency that operates solely within a situation. Table 2.1 lists all hypotheses that will be addressed in the current study.

Table 2.1. Hypotheses

Main relationship	1	Involvement in unstructured socializing is positively related to adolescent delinquency.
Explanatory processes	2	Exposure to opportunities for delinquency partially mediates the relationship between unstructured socializing and delinquency.
	3	Exposure to group processes partially mediates the relationship between unstructured socializing and delinquency.
	4	Increasing tolerance toward delinquency partially mediates the relationship between unstructured socializing and delinquency.
	5	Exposure to delinquent peers partially mediates the relationship between unstructured socializing and delinquency.
Sequence of processes	6	Exposure to delinquent peers and subsequent tolerance toward delinquency partially mediate the relationship between unstructured socializing and delinquency.
	7	Exposure to group processes and subsequent tolerance toward delinquency partially mediate the relationship between unstructured socializing and delinquency.
	8	Exposure to delinquent peers and subsequent exposure to group processes partially mediate the relationship between unstructured socializing and delinquency.

Current study

A few studies investigated mediation of the unstructured socializing–delinquency relationship by variables representing the proposed processes (Agnew and Petersen, 1989; Bernburg and Thorlindsson, 2001; Boman, 2013; Hawdon, 1996; Hughes and Short, 2014). The current study improves upon these studies in several aspects.

First, the current study goes beyond these previous studies by investigating the proposed processes independent from each other to establish which processes are relevant and which not, and which of the relevant processes matter the most. In previous studies, the distinction between the processes is often not clear, mostly because several variables were added to the model simultaneously or because variables represented more than one of the proposed processes. Agnew and Petersen (1989), for example, simultaneously added several control variables to a model predicting delinquency with leisure variables (e.g., time spent in ‘social activities’ and ‘hanging out’). These control variables included deviant beliefs and deviant friends, so it is not possible to distinguish between the indirect effects of these mediators based on their study. Also, their study does not enable distinguishing between mediator effects and spurious effects of confounding variables (influencing

both leisure and delinquency). Hawdon (1996) did something similar by simultaneously adding peer substance use and religiosity to a model that predicted marijuana use with routine activity patterns. Bernburg and Thorlindsson (2001) simultaneously added the variables 'deviant peers' and 'definitions favorable to offending' to models predicting property offending and violent behavior with unstructured peer interaction. Moreover, their variable 'deviant peers' was a combined index for delinquent behavior among friends and friends' perceived attitudes toward delinquent behavior, so in fact this one variable reflected three of the processes that are proposed in the current study (namely exposure to delinquent peers, exposure to group processes and increased tolerance toward delinquency). Hughes and Short (2014) studied the mediating role of 'signifying' in the relationship between routine activities (among which 'hanging in the streets', 'attending house or quarter parties' and 'riding around in cars') and fighting. The term 'signifying' referred to social (provocative) interactions aimed at gaining status and respecting or disrespecting others. We may classify 'signifying' as a reinforcement process, but it also has similarities to provocation, which represents 'exposure to opportunities' in the current study.

A second contribution of the current study beyond previous work is that the current study expands the set of explaining processes. First, it explicitly distinguishes two *additional* processes that have not been empirically studied before in the unstructured socializing-delinquency relationship (group processes and opportunity), and second, it considers potential *sequential* effects that may be relevant in explaining the relationship between unstructured socializing and delinquency. Previous studies concerned only one or two of the proposed processes, which were most often delinquent peers or delinquent attitudes. Boman (2013) and Hawdon (1996) considered the mediating effects of friend deviance and peer substance use, respectively. Agnew and Petersen (1989) and Bernburg and Thorlindsson (2001) considered the effects of beliefs and deviant friends. The 'signifying' concept in Hughes and Short (2014) and the deviant peers measure from Bernburg and Thorlindsson (2001) also have similarities to group processes, but they are not explicitly studied as such. We do not know of studies that have explicitly investigated whether 'opportunity' mediates the unstructured socializing-delinquency relationship, nor of studies that studied sequential effects of the proposed processes in explaining the unstructured socializing-delinquency relationship.

Our research also improves *methodologically* on previous research by using longitudinal data, whereas most previous studies relied on cross-sectional data (Agnew and Petersen, 1989; Bernburg and Thorlindsson, 2001; Hawdon, 1996; Hughes and Short, 2014, the study of Boman, 2013 is an exception). Cross-sectional data does not enable fixed effects analyses and, therefore, the studies were unable to control for possible selection effects of adolescents with a delinquency tendency choosing unstructured leisure patterns. The current study estimates multilevel-path models that enable examination of differences between individuals as well as within-individual changes over time.

A second methodological improvement is that we use a more sophisticated measure of unstructured socializing, based on time diary data. None of the previous studies on this topic applied time diary methods to operationalize unstructured socializing. Most studies on the unstructured socializing-delinquency relationship investigated the association between several activities and deviancy (e.g., Osgood et al., 1996). Other studies used standardized questions asking, for example, 'how often, in an average week, do you spend hanging around with friends in absence of adults' (e.g., Bernburg and Thorlindsson, 2001; Osgood and Anderson, 2004). However, studies on time use methods found that individuals underreport leisure activities when they are questioned about these activities over longer periods of time (Niemi, 1993; Robinson and Godbey, 1999). Recall problems, subjective interpretations of activities and difficulties with estimating episode lengths across the day may result in distorted accounts of individuals' general activity patterns (Juster, Ono, and Stafford, 2003; Robinson, 1999). This underlines the relevance of time diary data for the operationalization of activity patterns.

Finally, the current study tests whether its findings are consistent across different types of delinquency: A general measure of delinquency, violence, theft and vandalism. There are indications that involvement in unstructured socializing is not associated with all kinds of delinquency. Müller, Eisner, and Ribeaud (2013) found, for example, that involvement in unstructured socializing longitudinally predicted shoplifting and vandalism, but not assault (see also Miller, 2013). Whereas other studies found that involvement in unstructured socializing was related to all studied types of delinquency, such as property delinquency, substance use (alcohol and marijuana) and violence (e.g., Anderson and Hughes, 2009).

Data and methods

Data

Data were used from the Study of Peers, Activities and Neighborhoods (SPAN), conducted by the Netherlands Institute for the Study of Crime and Law Enforcement (NSCR). For the data collection, forty secondary schools were approached in the city of The Hague and its suburbs (the Netherlands). Ten schools agreed to participate and all of their first graders (similar to the seventh grade in the United States, students were approximately 12 to 13 years old) and fourth graders (similar to the tenth grade in the United States, students were approximately 15 to 16 years old) were asked to join the study. The main reason for nonparticipation of schools was that they participated in other research projects and were hesitant to disturb the lessons any further (Bernasco et al., 2013b: 905). Of the 942 students invited to participate in the study, 843 adolescents aged 11-17 participated fully in the study in 2008-2009. These 843 respondents were approached to join the study a second time in 2010-2011 (two years later) and 615 of them agreed to do that. The response rate for the second wave in proportion to the first wave was therefore 73 percent. The main reason for attrition was a lack of time or willingness to participate. Dropouts were generally older than participants and were more often involved in unstructured socializing and theft. They were slightly more tolerant toward substance use and offending than the participants, reported more delinquency of their friends and less parental monitoring. Dropouts and participants did not differ significantly in self-reported violence, vandalism or general delinquency (results of Mann-Whitney tests, see also Chapter 5, which appeared as Hoeben and Weerman, 2014).

Analyses were conducted with data from respondents who participated fully in both waves. Deletion of respondents with missing information for ethnicity and unstructured socializing resulted in a sample size of 610. The sample consisted of 52.6 percent boys and 47.4 percent girls, 56.7 percent belonged to the youngest age cohort (the initial first graders) and 43.3 percent belonged to the oldest age cohort (the initial fourth graders). The mean age was 14.4 in the first and 16.5 in the second wave. Both waves covered several months, the time-lag between the waves fell between 1.6 and 2.6 years for almost all respondents (99.4 percent). Most of the respondents had a highly

urbanized background: At the time of the first interview, 93.6 percent lived in ‘very strongly urban’ neighborhoods (≥ 2500 addresses per squared kilometer) or ‘strongly urban’ neighborhoods (1500 to 2500 addresses per squared kilometer), following the classification of Statistics Netherlands. The majority of the sample was from native Dutch descent, but a relatively large portion of the sample had an ethnic minority background (44.6 percent). Also, a relative large portion of the respondents followed lower forms of secondary education. For more information on the SPAN sample and data collection, see the Chapter 1 or publications of Bernasco et al. (2013b) and Weerman et al. (2013).

Measurement

The current study used a questionnaire and a *space-time budget interview*. Both instruments were similar to the ones used in the Peterborough Adolescent and Young Adult Development Study of Wikström et al. (2012a); except that the instruments were translated to Dutch and that the SPAN instruments incorporated some additional measures on, for example, peer- and parental influence. The questionnaire was used to construct scales for self-reported delinquency, variables that represent the proposed explaining processes and the control variables ‘parental monitoring’ and ‘self-control’. Other demographic information (on, for example, ethnic background, age and gender) was noted in a separate document prior to the interview. Research assistants supervised four respondents simultaneously while they completed the questionnaire. This intensive procedure resulted in very low rates of item non-response (with a maximum of 2 percent).

During the *space-time budget interview*, which was used to create a measure for ‘involvement in unstructured socializing’, respondents were asked about their hourly activities and whereabouts in four days preceding the interview, including Friday, Saturday and the two most recent week days. For every hour, the respondents were asked about the nature of their main activity, the geographical location and the functional location (e.g., home, school, street) of this activity and who the respondent was with, specified as ‘family’, ‘peers’ and ‘other people’. The space-time budget interviews were individual, face-to-face interviews with each respondent (for a further discussion of the method, see Chapter 3, which appeared as Hoeben et al., 2014, or Wikström,

Treiber and Hardie, 2012c). Non-typical days (when a respondent was ill that day or had a day off at school) were excluded from the analyses, because the current study assumed that the activities during the space-time budget interviews represented respondents' normal routines. Individual sum scores were corrected for the exclusion of the non-typical days.

The validity of the space-time budget data has been explored in previous studies by comparing information obtained from the interviews to information obtained with the questionnaires. Bernasco et al. (2013b) report correlations of .64 and .73 for alcohol measures and correlations of .57 and .63 for cannabis use measures for the two SPAN waves of data collection, respectively. Hoeben and Weerman (2014, Chapter 5) report correlations of .44 and .43 for 'time spent with peers on the streets and in parks' and correlations of .38 and .44 for 'time spent with peers at youth centers and societies' for the two SPAN waves of data collection, respectively. Although the validity of the space-time budget method needs further attention, we felt that the correspondence between the questionnaire and space-time budget measures was sufficient, especially when taking into account that the space-time budget interview recorded only four days and used different units than the questionnaire.

Measures

Self-reported measures of four types of delinquency were included in the analyses: Violence, theft, vandalism and a 'general' measure that incorporated a variety of offenses. Respondents were asked how often they were involved in several types of delinquency in the preceding school year: Never (value 0); once (value 1); twice (value 2); three to five times (value 3); six to ten times (value 4); more than ten times (value 5). The final measures were constructed by summing the items while retaining the values of the original categories. The *violence*-construct incorporated three items on whether the respondent had threatened someone; kicked or hit someone on the street; and whether he or she injured someone by kicking or hitting. *Theft* was measured with seven items asking whether the respondent had broken into a house to steal something; broken into a car to steal something; broken in elsewhere to steal something; had stolen from someone covertly; had stolen something worth more than five euro (6.85 USD) from a shop; had stolen a bicycle; or

had stolen a moped or scooter. The *vandalism*-construct incorporated two items on whether respondents had defaced walls, doors or other objects with paint, pen or spray paint and on whether they had destroyed or damaged things such as bicycles, bus stops, street lights or something else. The *general delinquency* measure was an index of the respondents' delinquency across twenty types of delinquency, among which the items from the separate measures (violence, theft and vandalism) and eight additional items on whether respondents had stolen worth less than five euro (6.85 USD) from a shop; set fire to something; had bought stolen goods; had robbed someone; sold soft drugs; sold hard drugs; carried a weapon; and whether they had used a weapon. All four delinquency variables were treated as count variables with negative binomial distributions. Descriptive statistics on all variables are given in Table 2.2. Results from principal components analyses and reliability analyses on the delinquency measures can be found in Appendix 2B in the supplementary material.

Table 2.2. Descriptive statistics (N = 610)

Variables	Mean		SD		Min		Max		Cronbach's alpha		ICC ^a
	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	
Delinquency (general)	5.923	4.707	9.416	7.672	.000	.000	100,000	57,000	.880	.839	.368
Violence	1.633	1.207	2.925	2.477	.000	.000	15,000	15,000	.790	.794	.436
Theft	.640	.664	2.388	2.059	.000	.000	35,000	16,000	.873	.683	.241
Vandalism	1.494	1.177	2.160	1.987	.000	.000	10,000	10,000	.595	.585	.308
Unstructured socializing	5.125	5.831	5.818	6.279	.000	.000	43,000	44,000	-	-	.349
Perceived temptation	8.360	8.258	3.115	3.111	4,000	4,000	20,000	20,000	.623	.631	.418
Perceived provocation	9.348	8.613	3.039	2.803	5,000	5,000	20,000	20,000	.789	.787	.390
Delinquent reinforcement	11.492	11.716	3.356	3.334	4,000	4,000	20,000	20,000	.672	.716	.485
Peer influence conformity	5.576	5.503	2.014	1.982	3,000	3,000	14,000	14,000	.590	.694	.389
Rule breaking tolerance	17.534	18.287	4.555	4.111	7,000	7,000	28,000	27,000	.848	.827	.534
Substance use tolerance	6.251	7.700	3.017	2.976	3,000	3,000	12,000	12,000	.865	.836	.510
Offending tolerance	7.307	7.352	2.659	2.537	5,000	5,000	20,000	20,000	.816	.802	.371
Delinquent peers	8.820	9.085	3.331	2.932	6,000	6,000	23,000	24,000	.818	.722	.398
Parental monitoring	17.178	16.194	4.094	4.693	5,000	5,000	25,000	30,000	.759	.817	.389
Self-control	29.630	30.151	6.265	5.885	10,000	13,000	45,000	48,000	.744	.720	.558
Age	14.402	16.523	1.626	1.660	11.330	13.750	17.920	20.250	-	-	-

ABBREVIATIONS: SD = standard deviation; ICC = intra-class correlation; T1 = first wave data collection; T2 = second wave data collection; Min = minimum; Max = maximum.

^aThe ICCs are calculated in Stata as suggested by Hilbe (2011: 492) and Hosmer and Lemeshow (2000: 320). The ICCs express the percentage of the total variance that is at the individual level. For example, the ICC of delinquency (general) expresses that approximately 37 percent of the variance in delinquency is explained by differences between adolescents. The other 63 percent is explained by differences over time.

Involvement in unstructured socializing expressed the total number of hours (for all four days covered by the space-time budget interviews) the respondent spent in ‘unsupervised unstructured peer-oriented activity’: It incorporated the hours in which the respondent was involved in unstructured activity, in which one or more peers were present and in which no adult family members or other significant adults were present. Unstructured activities were defined as ‘activities in which there are no rules or only (unwritten) rules that can be easily broken by every individual that is involved in the activity’ (for example ‘hanging around’, ‘skate boarding’, ‘watching television’ and ‘going to a party’). A list of all activities that were defined as ‘unstructured’ is given in Appendix A at the end of the book. The critical reader may note that we included a broader set of activities than was used in the original operationalization of Osgood et al. (1996). We chose to do so, because a broader set of activities than the activities they included fall under the concept of unstructured socializing if they occur in the presence of peers and absence of authority figures. These activities leave time “available for deviance” and do not “place (..) individuals in roles that make them responsible for social control” (Osgood et al., 1996: 640-641). Osgood et al. (1996: 652) were not able to scrutinize the people who were present during the activities and acknowledged that “better measures would more explicitly distinguish when authority figures are present from when they are not” and that their “set of four unstructured activities is only a narrow sample of the relevant universe of activities.” We thus consider our measure of involvement in unstructured socializing an improvement over the measures used in previous studies. However, to enable the comparison of our results to previous studies on this topic, all models were recalculated with an alternative measure for unstructured socializing that only included the activities ‘hanging around’, ‘walking or biking around without a goal’, ‘going to a party’, ‘going out’, ‘combination of socializing’, ‘socializing’, ‘talking’, ‘going to a birthday party’ and ‘socializing and having a drink’. Results of these additional analyses are given in the supplementary material (Appendix 2I). The pertinent details are provided below, but suffice is to say that the results are very similar to the findings presented in the main body of this chapter. We did not find that any of the two measures (with strict and broad definition of unstructured activities) lead to overall stronger or weaker estimated relationships. The model-fit measure (BIC) indicated that

the models with the broader defined measure for unstructured socializing fitted the data slightly better, but the differences were minimal.

Each explanatory process was represented by one or more variables. The scales for these variables were constructed based on theoretical considerations, principal component analyses (eigenvalues greater than one-criterion; direct oblimin rotation) and reliability analyses. Results of the principal components analyses and reliability analyses are available in the supplementary material (Appendix 2C). In the following paragraph, we will briefly describe the variables that represented the explanatory processes. More information on the items and the answer categories of these variables is provided in Appendix 2A at the end of this chapter; alphas and other descriptive statistics are presented in Table 2.2.

Process one, exposure to opportunities for delinquency, was represented by two variables: 'Perceived temptation' and 'perceived provocation'. *Perceived temptation* included four questions about the last time a respondent felt tempted to commit four types of delinquent acts. A higher score indicated a more recent temptation. This construct originated from the PADS+ study (Wikström et al., 2010; Wikström et al., 2012a). *Perceived provocation*, a construct that consisted of five items, measured how often adolescents believed they were provoked (e.g., to start an argument or fight). This construct was developed for SPAN. Process two, exposure to group processes, was represented by 'delinquent reinforcement' and 'peer influence toward conformity'. *Delinquent reinforcement* was an index of four items about perceived peer reinforcement to become involved in delinquent behavior. *Peer influence toward conformity* incorporated three items on the extent to which respondents perceived peer pressure to engage in unwanted behavior. The variables representing delinquent reinforcement and peer influence toward conformity originated from the NSCR School Project (Megens and Weerman, 2012; Weerman and Hoes, 2012) and were originally inspired by measures from the National Youth Survey (Elliott, Huizinga, and Ageton, 1985). Process four, increased tolerance toward delinquency, was represented by three variables: *Tolerance toward rule breaking* (seven items), *tolerance toward substance use* (three items) and *tolerance toward offending* (five items). These constructs included items that ask respondents 'how bad do you think it is when someone your age' is involved in certain acts. The constructs originated from the PADS+ study (Wikström et al., 2010; Wikström et al.,

2012a) and were modified versions of the constructs used in the Pittsburgh Youth Study (Loeber et al., 1998) and the National Youth Survey (Elliott, Huizinga, and Ageton, 1985). The variable that represented process five, exposure to *delinquent peers*, included six items asking respondents about their friends' involvement in six different types of delinquent behavior.

Gender, ethnicity, parental monitoring, self-control and age were included as control variables for the between-individual analyses. *Gender* was a dichotomous variable that expressed whether the respondent was a boy or a girl. *Ethnicity* was a dichotomous variable that expressed whether the respondent was from native Dutch descent or from an ethnic minority. We followed the definition of Statistics Netherlands, stating that a person is from native Dutch descent if both of his or her parents were born in the Netherlands. *Parental monitoring* was derived from the parental control-measure of Kerr and Stattin (2003). The five items included, for example, 'I can just go out at night (after 7.00p.m.), without having to tell my parents' and 'If I go out, my parents expect me to tell where I go, with whom and what I'm going to do'. Answer categories were: YES!; yes; yes or no; no; NO! and 'Not applicable, I do not live with my parents any more' (the latter was coded as missing). The construct for *self-control* was based on the measure from Grasmick et al. (1993). The ten items included, for example, 'I often do things without thinking of the consequences' and 'I always say what I think'. Answer categories were: YES!; yes; yes or no; no; NO! For age, parental monitoring and self-control, we used the averages of the first and second interview. Descriptive statistics on the variables are given in Table 2.2.

Analytical strategy

To investigate whether the variables representing the four proposed processes mediate the relationship between unstructured socializing and delinquency, we estimate: a) The direct relationship between involvement in unstructured socializing and delinquency, b) the direct relationships between involvement in unstructured socializing and the variables that represent the proposed processes, c) the direct relationships between the variables that represent the proposed processes and delinquency, and finally d) the indirect effect of unstructured socializing on delinquency *through* the mediating variables.

For these different types of relationships, we examined between-individual effects as well as within-individual changes over time. The latter offer a more stringent test, because within-individual effects are unaffected by individual characteristics that are stable across the waves of data collection. The method thereby deals partly with the possible presence of confounding 'selection' effects. Selection exists if, for example, prior involvement in delinquency is a predictor of involvement in unstructured socializing. The estimation of within-individual changes over time requires at least two interviews per individual with some time-lag in between, which applies to the data used for the current study that were collected at two moments with approximately two years in between.

The direct and indirect relationships and the between-individual and within-individual effects were estimated simultaneously in multilevel-path models with Mplus (version 7.2), following suggestions by Preacher, Zyphur, and Zhang (2010). Indirect effects were estimated by multiplying the coefficients of each of the paths in the mediational chain: To estimate the indirect effect of unstructured socializing on delinquency through one mediator, we multiplied the coefficients of two paths; for two-mediator chains, we multiplied three paths. The standard errors of the indirect effects were calculated in Mplus with the multivariate delta method (Bollen, 1987). Muthén and Asparouhov (2015) argued that this approach is only valid for the underlying latent continuous dependent variable and not for the observed count dependent variable. Although we are also interested in the underlying latent variable, to meet their concerns, we reran the separate indirect effects to obtain counterfactually-defined indirect effects (method is discussed in Muthén, 2011, and Muthén and Asparouhov, 2015) and report these alongside the indirect effects that were obtained with the multiplication-method. Independent variables were person-mean centered prior to analysis and person-mean variables were added to the models alongside the 'deviation from the person-mean' variables, as suggested by Allison (2009). Because we regarded the dependent variable (adolescent delinquency) as negative binomially distributed, the models were estimated with robust maximum likelihood estimation (MLR estimator) to correct the standard errors and confidence intervals (Yuan and Bentler, 1998). The models were also estimated while treating general delinquency, violence, theft and vandalism as normally distributed variables, but the count models

had a better fit. We dealt with missing values prior to model estimation by applying multiple imputation, using the expectation maximization method.

The zero-order covariance and correlation matrices are available in the supplementary material as Appendix 2D. None of the bivariate correlations at the between-individual level was higher than .589 (not taking into account the correlations between general delinquency and violence, theft and vandalism) and none of the bivariate correlations at the within-individual level was higher than .530 (*idem*). The average VIF was 1.72 at the between-individual level, the highest VIF for the variables at the between-individual level was 2.61. The average VIF was 1.28 at the within-individual level, the highest VIF was 1.63. Based on these findings, we did not expect multicollinearity to bias the models and we therefore interpreted the variables representing the proposed processes as separate sources of influence on delinquency.

Findings

The first columns in Table 2.3 present the within-individual results of a multilevel-path model where delinquency is regressed on unstructured socializing (Model 1). These results concern the ‘general’ delinquency measure only. The results for violence, theft and vandalism can be found in Appendices 2F, 2G and 2H of the supplementary material, respectively, and will be discussed at the end of the findings section.

Since delinquency is analyzed as negative binomially distributed, all paths to delinquency were interpreted as loglinear (the other paths are linear). Loglinear paths express the change in log count of delinquency with every one unit increase of the independent variable and are best interpreted with Incidence Rate Ratios (IRRs): $e^{\text{coefficient}}$. The IRRs express the percentage increase in delinquency with every one unit increase of the independent variable.

The coefficient of unstructured socializing at the within-individual level ($B = .019$, $p < .05$, $IRR = 1.019$) indicates a positive relationship between unstructured socializing and delinquency that exists irrespective of time-stable individual characteristics such as self-control or gender. The coefficients indicate that an increase of about *one hour* involvement in unstructured socializing over the four space-time budget days between the

two waves of data collection (approximately two years) was associated with an increase of approximately 1.9 percent in the delinquency variable *for the same adolescent*. These results are in line with Hypothesis 1, which states that involvement in unstructured socializing is positively related to delinquency.

The results at between-individual level, which are displayed in Table 2E.1 in the supplementary material, confirm the existence of this relationship when looking at differences between adolescents. The findings indicate that the delinquency level was approximately 8.2 percent higher for a person A, who on average spent *one more hour* in unstructured socializing compared to person B ($B = .079, p < .01, IRR = 1.082$). Although the findings at between-individual level are interesting of itself to give a more complete picture of the relationship⁷, we decided to focus on the within-individual results as they offer a more stringent test by partly dealing with potential confounding selection effects. In the remainder of this section, we will only discuss the within-individual results. The between-individual results can be found in the supplementary material (Appendix 2E).

7 Within-individual results solely concern changing scores of variables over time. These results do not take into account how frequent individuals were initially involved in unstructured socializing or delinquency and they do not give information about differences between subjects. For example, within-individual analyses cannot determine whether individuals who are frequently involved in unstructured socializing score higher on delinquency than other individuals, whereas between-individual analyses can.

Table 2.3. General delinquency regressed on unstructured socializing, variables representing the explanatory processes and control variables, direct and indirect effects (N = 610)

	Model 1		Model 2		Model 3		PNIE ^c	
	B	(SE)	β	(SE)	B	(SE)	B	(SE)
Direct effects								
Unstructured socializing > delinquency ^a	.019*	(.009)	.066*	(.007)	-.001	(.007)	-.004	-
Unstructured socializing > perceived temptation			.059*	(.027)	.122*	(.027)	.122*	-
Unstructured socializing > perceived provocation			.009	(.021)	.019	(.021)	.019	-
Unstructured socializing > delinquent reinforcement			.061**	(.020)	.125**	(.019)	.071+	-
Unstructured socializing > peer influence conformity			-.011	(.014)	-.035	(.014)	-.047	-
Unstructured socializing > rule breaking tolerance			.051+	(.028)	.084+	(.023)	.022	-
Unstructured socializing > substance use tolerance			.070**	(.019)	.158**	(.017)	.084*	-
Unstructured socializing > offending tolerance			.063**	(.020)	.150**	(.016)	.077*	-
Unstructured socializing > delinquent peers			.091**	(.026)	.182**	(.026)	.182**	-
Perceived temptation > delinquency ^a			.110**	(.020)	.184**	(.020)	.184**	-
Perceived provocation > delinquency ^a			.019	(.019)	.031	(.019)	.031	-
Delinquent reinforcement > delinquency ^a			.054*	(.022)	.092*	(.022)	.092*	-
Peer influence conformity > delinquency ^a			-.013	(.025)	-.015	(.025)	-.015	-
Rule breaking tolerance > delinquency ^a			.025	(.017)	.053	(.017)	.053	-
Substance use tolerance > delinquency ^a			-.006	(.019)	-.009	(.019)	-.009	-
Offending tolerance > delinquency ^a			.066**	(.022)	.097**	(.022)	.097**	-
Delinquent peers > delinquency ^a			.051**	(.019)	.087**	(.019)	.087**	-
Delinquent reinforcement > rule breaking tolerance					.253**	(.060)	.204**	-
Delinquent reinforcement > substance use tolerance					.123**	(.036)	.136**	-
Delinquent reinforcement > offending tolerance					.148**	(.039)	.173**	-
Peer influence conformity > rule breaking tolerance					.188*	(.085)	.099*	-
Peer influence conformity > substance use tolerance					-.005	(.055)	-.004	-
Peer influence conformity > offending tolerance					.103+	(.058)	.078+	-

Continuation of Table 2.3

	Model 1		Model 2		Model 3		PNIE ^c	
	B	(SE)	β	B	(SE)	β	B	(SE)
Paths, variances and model fit statistics								
Delinquent peers > delinquent reinforcement				.292 **	(.040)	.297 **	-	-
Delinquent peers > peer influence conformity				.042	(.032)	.065	-	-
Delinquent peers > rule breaking tolerance				.270 **	(.048)	.222 **	-	-
Delinquent peers > substance use tolerance				.276 **	(.038)	.311 **	-	-
Delinquent peers > offending tolerance				.252 **	(.040)	.299 **	-	-
Indirect effects ^b								
Perceived temptation			.007 *	.023 *	(.003)	.023 *	.050	(.047)
Perceived provocation			.000	.001	(.000)	.001	.002	(.019)
Delinquent reinforcement			.003 +	.011 +	(.002)	.007	.042	(.037)
Delinquent reinforcement > rule breaking tolerance				.000	(.000)	.001	-	-
Delinquent reinforcement > substance use tolerance				.000	(.000)	.000	-	-
Delinquent reinforcement > offending tolerance				.000	(.000)	.001	-	-
Peer influence conformity			.000	.001	(.000)	.001	-.004	(.012)
Peer influence conformity > rule breaking tolerance				.000	(.000)	.000	-	-
Peer influence conformity > substance use tolerance				.000	(.000)	.000	-	-
Peer influence conformity > offending tolerance				.000	(.000)	.000	-	-
Rule breaking tolerance			.001	.004	(.001)	.001	.028	(.048)
Substance use tolerance			.000	-.001	(.001)	-.001	.036	(.027)
Offending tolerance			.004 *	.015 *	(.002)	.008	.051	(.039)
Delinquent peers			.005 *	.016 *	(.002)	.016 *	.061	(.041)
Delinquent peers > delinquent reinforcement				.001 +	(.001)	.005 +	-	-
Delinquent peers > peer influence conformity				.000	(.000)	.000	-	-
Delinquent peers > rule breaking tolerance				.001	(.000)	.002	-	-
Delinquent peers > substance use tolerance				.000	(.000)	-.001	-	-
Delinquent peers > offending tolerance				.002 *	(.001)	.005 *	-	-

Continuation of Table 2.3

Paths, variances and model fit statistics	Model 1		Model 2		Model 3		PNIE ^c	
	B	(SE)	β	(SE)	B	(SE)	β	(SE)
Residual variances								
Perceived temptation			2.776 **	(.227)	.985 **	(.227)	2.776 **	(.227)
Perceived provocation			2.647 **	(.221)	1.000 **	(.221)	2.647 **	(.221)
Delinquent reinforcement			2.836 **	(.186)	.984 **	(.172)	2.590 **	(.172)
Peer influence conformity			1.218 **	(.092)	.999 **	(.091)	1.213 **	(.091)
Rule breaking tolerance			4.382 **	(.315)	.993 **	(.272)	3.789 **	(.272)
Substance use tolerance			2.270 **	(.154)	.975 **	(.129)	1.954 **	(.129)
Offending tolerance			2.074 **	(.220)	.977 **	(.175)	1.737 **	(.175)
Delinquent peers			2.869 **	(.234)	.967 **	(.234)	2.869 **	(.234)
Dispersion delinquency			.864 **	(.097)	.507 **	(.066)	.508 **	(.066)
Values of fit statistics								
Intercept delinquency	5.556 **	(.539)			.231	(.647)	.127	(.648)
Residual variance delinquency	.428 **	(.091)	.428 **	(.055)	.231 **	(.055)	.232 **	(.055)
LL	-2979.467				-34167.853		-33510.780	
BIC (sample size adjusted)	5998.236				68634.400		67406.719	

NOTES: Results at within-individual level. Values of fit statistics are applicable for both within-individual and between-individual estimates: These effects are estimated simultaneously in the same model. Between-individual estimates are presented in Table 2E.1 in the supplementary material. Standardized estimates are obtained by standardizing independent variables prior to model estimation.

ABBREVIATIONS: SE = standard error; PNIE = Pure Natural Indirect Effect; LL = log likelihood; BIC = Bayesian Information Criterion.

^aCoefficients of the direct paths to delinquency report changes in the log count-rate.

^bIndirect effects express the effect of unstructured socializing on delinquency through specified variables.

^cCalculated as suggested by Muthén (2011) and Muthén and Asparouhov (2015).

+p < .10; *p < .05; **p < .01 (two-tailed).

Mediation of the unstructured socializing - delinquency relationship

After confirming that the unstructured socializing-delinquency relationship existed in our data and that it was not spurious, we turned to our analysis of mediation. The variables representing the four processes were added to the model in Model 2, Model 3 also includes the sequential effects (Table 2.3). For a visualization of the results of Model 3, see Figure 2.2. The results from Models 2 and 3 in Table 2.3 indicate that the magnitude of the association between unstructured socializing and delinquency decreased by 95 percent and was no longer significant after the mediators (variables representing the processes) were added to the model ($B = -.001$, $p > .10$; IRR = .999). The decrease of the direct effect between unstructured socializing and delinquency suggests that the proposed processes indeed offer an explanation for the relationship.

To further study these *mediation effects*, we focused per process on a) the direct relationships between unstructured socializing and the variables representing the proposed processes, b) the direct relationships between these variables and delinquency, and c) the indirect effects of unstructured socializing on delinquency through the variables representing the proposed explanatory processes.

Exposure to opportunities for delinquency

The results from Model 2 in Table 2.3 show that involvement in unstructured socializing is positively related to perceived temptation ($\beta = .122$, $p < .05$), and that perceived temptation is positively related to delinquency ($B = .110$, $p < .01$, IRR = 1.116). These two positive direct paths suggest the presence of an indirect effect, and we indeed find marginal support for it. When we calculate the standard errors of the indirect effect with the multivariate delta method, the results indicate a significant positive indirect effect ($\beta = .023$, $p < .05$), but following the method from Muthén and Asparouhov (2015), the indirect effect does not differ significantly from zero ($B = .050$, $p > .10$). The second variable that represents the process 'exposure to opportunities': Perceived provocation, does not seem to be relevant in explaining the unstructured socializing-delinquency relationship. We do not find direct

or indirect effects between this variable, involvement in unstructured socializing and delinquency.

The results are partly in line with Hypothesis 2. We find support for direct effects between involvement in unstructured socializing, perceived temptation and delinquency, but the support for an indirect effect is less robust. We do not find support for associations between the key variables (unstructured socializing and delinquency) and perceived provocation.

Exposure to group processes

The results from Model 2 in Table 2.3 indicate that delinquent reinforcement is positively related to involvement in unstructured socializing ($\beta = .125, p < .01$) and to involvement in delinquency ($B = .054, p < .05, IRR = 1.055$). We find a modest indirect effect of unstructured socializing on delinquency through delinquent reinforcement when calculated with the multivariate delta method ($\beta = .011, p < .10$), but not when calculated with the method by Muthén and Asparouhov (2015; $B = .042, p > .10$).

Model 3 (Table 2.3) allows for direct paths between delinquent reinforcement, delinquent peers and tolerance toward delinquency, as well as for sequential effects. The results from Model 3 indicate that the direct path from delinquent reinforcement to delinquency remains after allowing for these additional paths ($B = .054, p < .05, IRR = 1.055$), but that the direct path from unstructured socializing to delinquent reinforcement decreases substantially ($\beta = .071, p < .10$) and that the *indirect path* of unstructured socializing on delinquency through delinquent reinforcement seems to disappear ($\beta = .007, p > .10$). These results suggest that the indirect effect through delinquent reinforcement actually is explained with exposure to delinquent peers, in that involvement in unstructured socializing exposes adolescents to delinquent peers, which exposes them to delinquent reinforcement, which increases the likelihood of involvement in delinquency (sequential effect: $\beta = .005, p < .10$). On the other hand, although we find direct paths between delinquent reinforcement and the tolerance measures (rule breaking tolerance, substance use tolerance and offending tolerance), the results do not support sequential mediation of the unstructured socializing-delinquency relationship through delinquent reinforcement and subsequent tolerance toward delinquency.

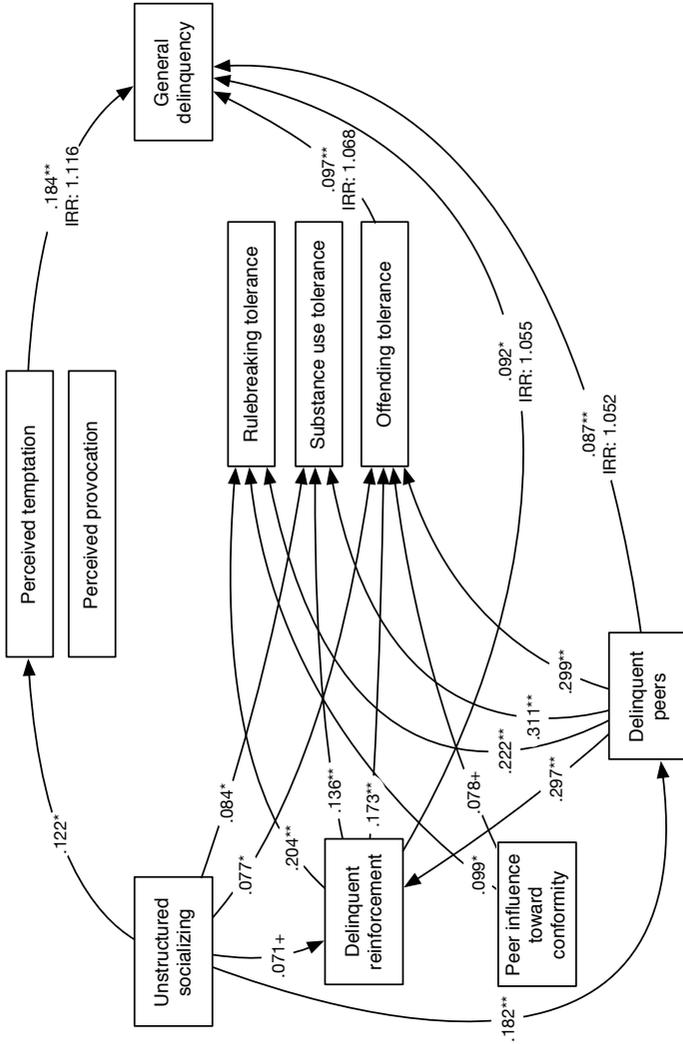


Figure 2.2. Standardized robust maximum likelihood estimates at within-individual level for general delinquency, Model 3. Only significant paths are displayed ($+p < .10$; $*p < .05$; $**p < .01$, two-tailed). Control variables excluded for clarity reasons. For a full presentation of the results, see Table 2.3

The results do not suggest that *peer influence toward conformity* is relevant in explaining the relationship between unstructured socializing and delinquency. Peer influence toward conformity does not seem to be related to unstructured socializing or delinquency at the within-individual level in any of the models. We do find positive relationships between peer influence toward conformity and rule breaking tolerance ($\beta = .099, p < .05$) and offending tolerance ($\beta = .078, p < .10$), but none of the single-mediator or two-mediator indirect effects that involve peer influence toward conformity differ significantly from zero.

The results for delinquent reinforcement give modest support for Hypothesis 8 (regarding the sequential effect through delinquent peers and subsequent exposure to group processes), but are not in line with Hypothesis 3 (on the indirect effect through group processes) and Hypothesis 7 (concerning the sequential effect through group processes and subsequent tolerance toward delinquency). The results do not suggest the presence of an indirect effect of unstructured socializing on delinquency through peer influence toward conformity.

Increased tolerance toward delinquency

Results from Model 2 (Table 2.3) suggest that involvement in unstructured socializing is, as expected, positively related to rule breaking tolerance ($\beta = .084, p < .10$), substance use tolerance ($\beta = .158, p < .01$) and offending tolerance ($\beta = .150, p < .01$). However, contrary to our expectations, only one of the three tolerance measures is significantly related to general delinquency (offending tolerance: $B = .066, p < .01, IRR = 1.068$). Offending tolerance is thus the only one of the tolerance measures that mediates the unstructured socializing-delinquency relationship (indirect effect: $\beta = .015, p < .05$).

After adding direct paths between delinquent reinforcement, delinquent peers and tolerance toward delinquency and allowing for serial mediation in Model 3 (Table 2.3), the indirect effect of offending tolerance in the unstructured socializing-delinquency relationship decreases to insignificance ($\beta = .008, p > .10$). Furthermore, results from Model 3 indicate that direct relationships are present between the tolerance measures and delinquent reinforcement and between the tolerance measures and delinquent peers. We find modest evidence for a sequential effect through exposure to delinquent

peers and subsequent tolerance toward offending (sequential effect: $\beta = .005$, $p < .05$). We do not find support for sequential effects through delinquent peers and subsequent tolerance toward rule breaking or substance use; nor do we find support for sequential effects through delinquent reinforcement or peer influence toward conformity and subsequent tolerance toward offending, rule breaking or substance use.

The results offer partial support for Hypothesis 4 and Hypothesis 6. In line with Hypothesis 4, we find that the unstructured socializing-delinquency relationship is mediated by tolerance toward offending, but not by tolerance toward rule breaking or substance use. However, this mediation is no longer found after allowing for sequential effects through delinquent peers. In line with Hypothesis 6, we find that the indirect effect of offending tolerance occurs partially through exposure to delinquent peers. We do not find support for sequential effects through group processes (delinquent reinforcement and peer influence toward conformity) and subsequent tolerance toward delinquency, as formulated in Hypothesis 7.

Exposure to delinquent peers

As expected, we found a positive direct effect between involvement in unstructured socializing and exposure to delinquent peers (Model 2, Table 2.3: $\beta = .182$, $p < .01$) and a positive direct effect from delinquent peers on delinquency (Model 2, Table 2.3: $B = .051$, $p < .01$, $IRR = 1.052$). Also, we found a positive indirect effect of unstructured socializing on delinquency through delinquent peers (Model 2, Table 2.3: $\beta = .016$, $p < .05$), although we have to remark that this effect at the within-individual level is not significantly different from zero when calculated with the method suggested by Muthén and Asparouhov (2015; $B = .061$, $p > .10$). Apart from the ‘independent’ indirect effect of delinquent peers in the unstructured socializing-delinquency relationship, exposure to delinquent peers also seems to explain the relationship through an increased exposure to delinquent reinforcement (sequential effect from Model 3, Table 2.3: $\beta = .005$, $p < .10$) and through shifting attitudes toward offending (sequential effect from Model 3, Table 2.3: $\beta = .005$, $p < .05$).

These results are in line with Hypothesis 5 (on the indirect effect through delinquent peers), although the indirect effect at the within-individual

level is less robust, and offer partial support for Hypotheses 6 and 8: The effect of exposure to delinquent peers runs through offending tolerance and delinquent reinforcement, but not through rule breaking tolerance, substance use tolerance or peer influence toward conformity.

Violence, theft and vandalism

To investigate whether the unstructured socializing-delinquency relationship depends on the type of delinquency and to examine whether different processes may be at play for different types of delinquency, all models were repeated with violence, theft and vandalism as dependent variables. The results from these analyses are presented in the supplementary material (Appendices 2F, 2G and 2H, respectively) and briefly described in the remainder of this section. Figures 2.3, 2.4 and 2.5 present the results in a more visual way.

Results from Model 1 (Tables 2F.1, 2G.1 and 2H.1 in the supplementary material) indicate that involvement in unstructured socializing is directly related to theft and vandalism, but not to violence ($B = .011$, $p > .10$, IRR = 1.011). An increase of *one hour* in involvement in unstructured socializing is related to an increase of approximately 5.2 percent in theft ($B = .051$, $p < .01$, IRR = 1.052) and approximately 2.4 percent in vandalism ($B = .024$, $p < .05$, IRR = 1.024) *for the same adolescent*. The magnitudes of all relationships (from unstructured socializing to violence, theft and vandalism) decrease after adding the variables that represent the proposed processes to the model, thus indicating the presence of mediation⁸.

While there is no evidence for a direct effect of involvement in unstructured socializing on *violence*, there could be important indirect effects. Indeed, the results from Model 3 in Table 2F.1 (in the supplementary material) indicate that the unstructured socializing-violence relationship is explained by perceived temptation (indirect effect: $\beta = .023$, $p < .10$) and exposure to delinquent peers (indirect effect: $\beta = .021$, $p < .10$). Furthermore,

⁸ The relationship between involvement in unstructured socializing and theft seemed somewhat stronger when estimated with the 'strict' measure for unstructured socializing. The coefficient for this relationship remained significantly different from zero in Models 2 and 3, where the mediating variables were added.

we found a sequential effect that explained the unstructured socializing-violence relationship through exposure to delinquent peers and a subsequent increased tolerance toward offending (sequential effect: $\beta = .007, p < .10$). Differences between the model for violence (Figure 2.3) and the model for general delinquency (Figure 2.2) are that the path from delinquent reinforcement to violence appears to be irrelevant and that the paths from perceived temptations ($B = .114, p < .01, IRR = 1.121$), delinquent peers ($B = .069, p < .05, IRR = 1.071$) and offending tolerance ($B = .083, p < .05, IRR = 1.087$) to *violence* appear to be somewhat stronger than to *general delinquency* (respectively $B = .110, p < .01, IRR = 1.116$; $B = .051, p < .01, IRR = 1.052$ and $B = .066, p < .01, IRR = 1.068$). Furthermore, violence is the only examined type of delinquency for which ‘perceived provocation’ is a significant predictor ($B = .056, p < .05, IRR = 1.058$).

Findings from Model 3 for *theft* (Table 2G.1 in the supplementary material) indicate that the relationship between involvement in unstructured socializing and theft is explained with an increased tolerance toward substance use (indirect effect: $\beta = .023, p < .10$) and exposure to delinquent peers (indirect effect: $\beta = .035, p < .05$). Apart from the independent indirect effects through these mediators, we also found a sequential effect through delinquent peers and subsequent tolerance toward substance use (sequential effect: $\beta = .016, p < .05$). Comparing the findings for theft (Figure 2.4) to that of general delinquency (Figure 2.2) suggests that exposure to delinquent reinforcement ($B = .077, p < .10, IRR = 1.080$) and to delinquent peers ($B = .112, p < .01, IRR = 1.119$) are more relevant in explaining theft, and that perceived temptations are less important ($B = .092, p < .10, IRR = 1.096$). The most striking difference, however, is that theft is predicted by respondents’ tolerance toward *substance use*, whereas the other investigated types of delinquency are predicted by respondents’ tolerance toward *offending*. The path from substance use tolerance toward theft is also particularly strong ($B = .181, p < .01, IRR = 1.198$), compared to the other paths to theft.

The relationship between involvement in unstructured socializing and *vandalism* (Table 2H.1, Model 3) is mainly explained with perceived temptations (indirect effect: $\beta = .028, p < .05$). An important difference between this model (Figure 2.5) and the models for the other types of delinquency (Figures 2.2, 2.3 and 2.4) is that exposure to delinquent peers does not seem to have an independent indirect effect in the relationship

between unstructured socializing and vandalism ($\beta = .004, p > .10$), only a sequential effect through tolerance toward offending (sequential effect: $\beta = .005, p < .10$). Findings in Table 2H.1 (in the supplementary material) and Figure 2.5 indicate that the paths from delinquent reinforcement and delinquent peers to vandalism are not significantly different from zero. Furthermore, the path from perceived temptations to vandalism ($B = .136, p < .01, IRR = 1.146$) is much stronger than the path from perceived temptations to the other investigated types of delinquency.

In summary, we found that the explanatory processes differed between the different types of delinquency. That being said, some of the processes were relevant for most of the relationships. Exposure to opportunities (to temptations rather than provocations; Hypothesis 2), exposure to delinquent peers (Hypothesis 5) and tolerance toward delinquency (Hypothesis 4) seemed relevant in most relationships, regardless of the type of delinquency. Also, the relevance of the sequential effect through delinquent peers and subsequent tolerance toward delinquency was fairly consistent across the different types of delinquency (Hypothesis 6). We found support for a sequential effect through delinquent peers and subsequent delinquent reinforcement for vandalism at the between-individual level, but not at the within-individual level (Hypothesis 8). None of the models offered support for Hypothesis 3 (on the indirect effect of group processes) and Hypothesis 7 (on the sequential effect through group processes and subsequent tolerance toward delinquency).

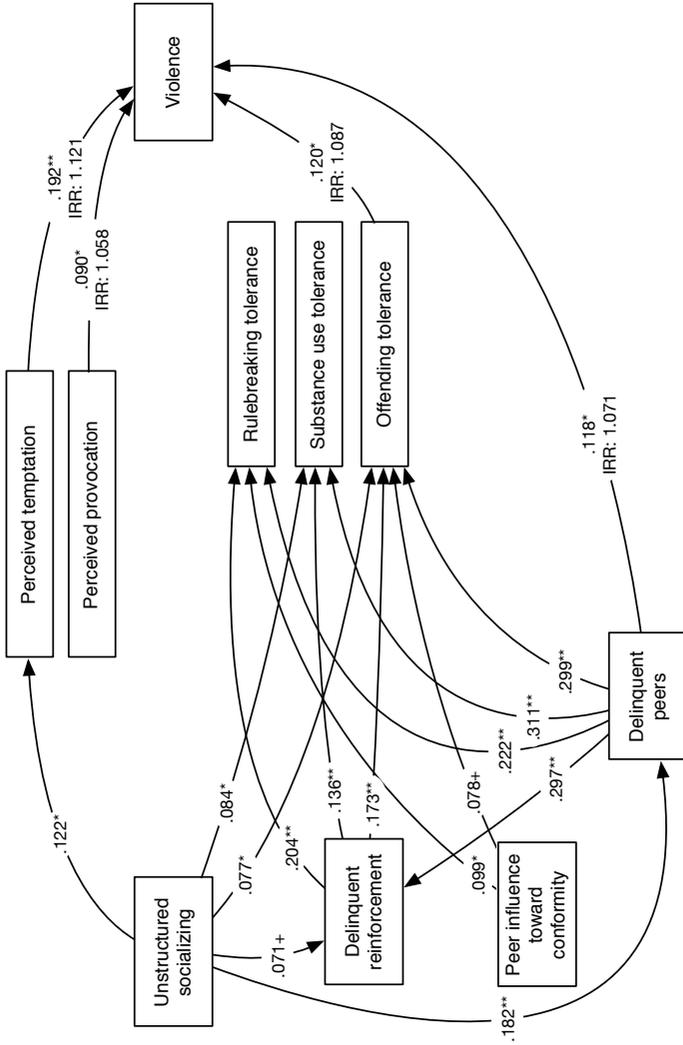


Figure 2.3. Standardized robust maximum likelihood estimates at within-individual level for violence, Model 3. Only significant paths are displayed (+ $p < .10$; * $p < .05$; ** $p < .01$, two-tailed). Control variables excluded for clarity reasons. For a full presentation of the results, see Table 2F.1 in the supplementary material

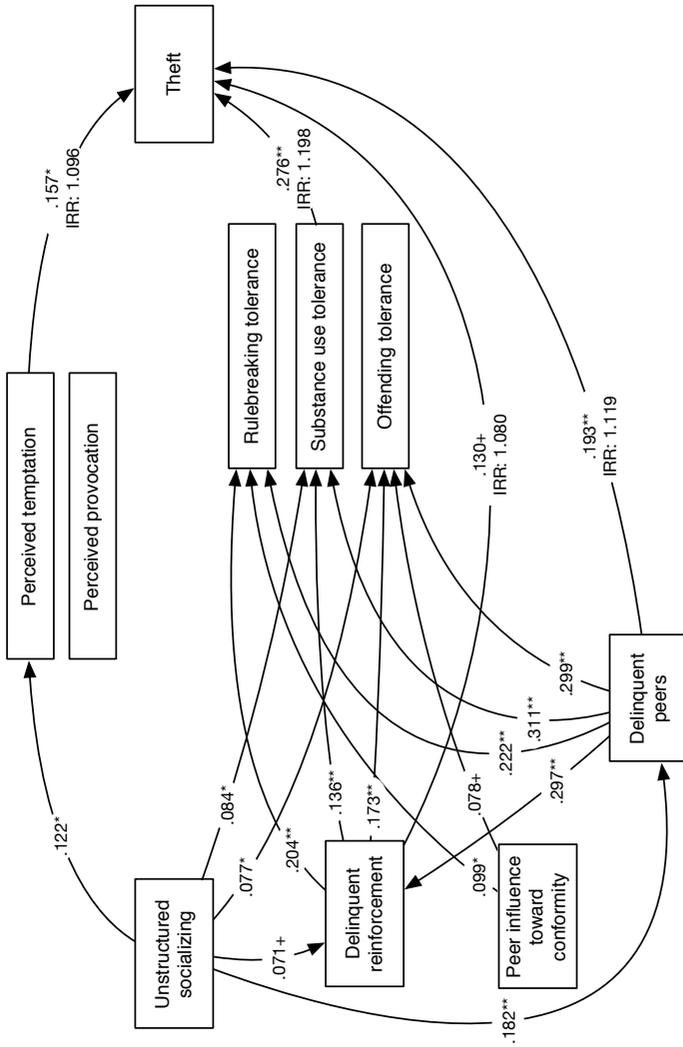


Figure 2.4. Standardized robust maximum likelihood estimates at within-individual level for theft, Model 3. Only significant paths are displayed ($+p < .10$; $*p < .05$; $**p < .01$, two-tailed). Control variables excluded for clarity reasons. For a full presentation of the results, see Table 2G.1 in the supplementary material

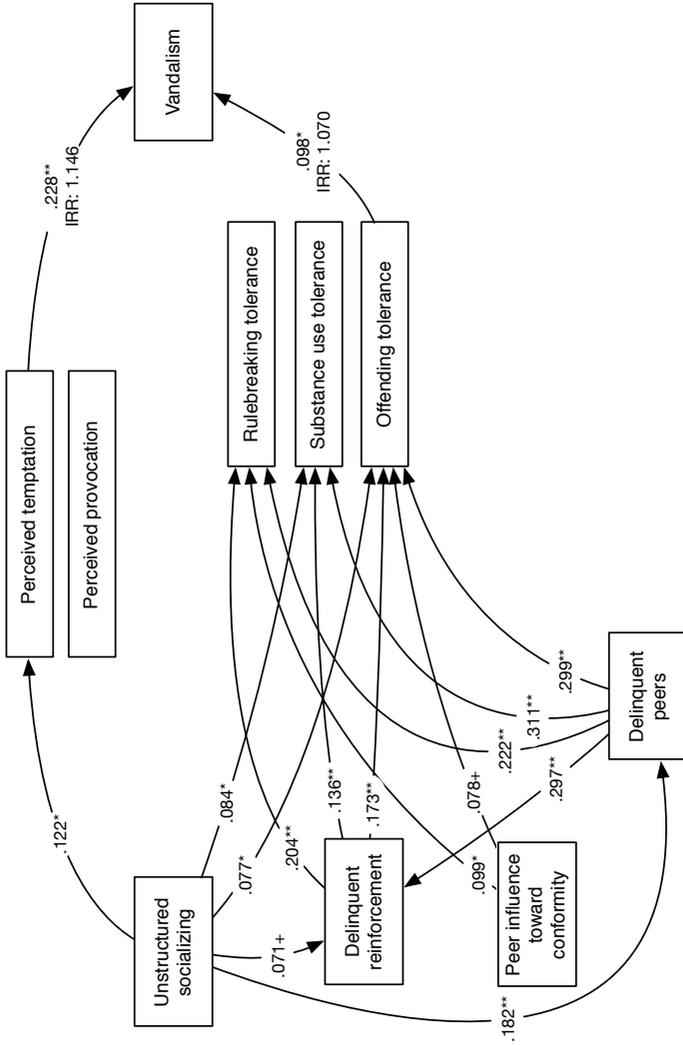


Figure 2.5. Standardized robust maximum likelihood estimates at within-individual level for vandalism, Model 3. Only significant paths are displayed (+ $p < .10$; * $p < .05$; ** $p < .01$, two-tailed). Control variables excluded for clarity reasons. For a full presentation of the results, see Table 2H.1 in the supplementary material

Discussion and conclusion

Routine activity patterns and lifestyles, in particular unstructured socializing, have been associated with individual delinquency in many studies. The empirical support for the association between unstructured socializing and delinquency is quite convincing (e.g., Osgood and Anderson, 2004; Svensson and Oberwittler, 2010; Vazsonyi et al., 2002), but until now no study has elaborated on this important relationship by empirically investigating different processes that may be responsible for the relationship. The purpose of this study was to investigate four potential explanatory processes: Exposure to opportunities for delinquency; exposure to group processes; increased tolerance toward delinquency; and exposure to delinquent peers.

Our findings suggest that involvement in unstructured socializing is related to delinquency for at least four reasons: 1) Adolescents experience temptations (perceive opportunities) for delinquency in situations of unstructured socializing; 2) adolescents are exposed to delinquent peers in situations of unstructured socializing; 3) which subsequently increases their exposure to delinquent reinforcement 4) and their tolerance toward offending. Some of these indirect effects are more substantial than others and the effects differ somewhat for the three types of delinquency that were investigated. We found relationships between unstructured socializing and theft and vandalism, but the relationship with violence was less robust. The relationship between unstructured socializing and vandalism was best explained with exposure to temptations (opportunity), the relationship with theft was best explained with exposure to delinquent peers and the relationship with violence was best explained with both of those processes, although other processes were also relevant.

Contribution to theory

The findings of the current study contribute to the increasing body of literature on the relationship between *unstructured socializing* and adolescent delinquency. Several empirical studies have shown that adolescents, who are more often involved in unstructured socializing, are more likely to be involved in delinquency. This relationship has proven to be robust in longitudinal tests (Osgood et al., 1996), at the situational level (Bernasco et al., 2013b) and

in cross-national studies (Vazsonyi et al., 2002). Although some scholars have suggested processes that might explain the relationship (Mahoney and Stattin, 2000; Osgood et al., 1996), or even investigated mediation of the relationship by variables that represent the proposed processes (Agnew and Peterson, 1989; Bernburg and Thorlindsson, 2001; Boman, 2013; Hawdon, 1996; Hughes and Short, 2014), we are unaware of previous studies that empirically compared different explanatory processes. The current study expanded the set of investigated explanatory processes by incorporating explanations that focus on attitude transference and exposure to delinquent peers in addition to ‘opportunities’ and ‘group processes’. Furthermore, the current study examined sequential effects derived from social learning theory and the situational inducement perspective. By expanding the theory and testing various explanatory processes, the current study brings us one step closer to disentangling the complex amalgam of opportunities and peer influence processes underlying the relationship between unstructured socializing and delinquency.

More generally, the findings of the current study provide further insight in the processes through which routine activities may be linked to delinquent behavior and thus contributes to a better understanding of *routine activity theory*. According to routine activity theory, “illegal activities must feed upon other activities” (Felson and Cohen, 1980: 393). The current study elaborates how delinquency ‘feeds upon’ involvement in unstructured socializing (Osgood et al., 1996) and integrates the routine activity approach with insights from social learning theory and differential association theory. Integrating these theories deepens the notion on how legal, regular activities may result in increased risks for delinquency. Our findings give reason to believe that a situation of ‘unstructured socializing’ is not only a setting that increases opportunity for crime, but also a situation that offers a certain social context for behavior. A situation in which peers are present and authority figures are absent opens the gates to several processes of peer influence. This broader perception of unstructured socializing is in line with earlier studies that explained the relationship between typical leisure activities and delinquency with Hirschi’s social control theory (Hawdon, 1996) or subcultural deviance theory (Agnew and Petersen, 1989). Future research is needed to determine whether principles from social learning theory are also relevant in explaining relationships between other routine activities and

individual behavior. Specifically, social learning processes may explain the relationship between involvement in structured leisure activities and positive developmental outcomes for adolescents (Eccles et al., 2003).

It is important to note, however, that exposure to temptations, or ‘opportunities’, remains an independent path explaining the relationship between unstructured socializing and delinquency after taking into account several peer influence processes. We argue that this path represents the risk associated with factors that are more or less non-peer related: The fact that adolescents are not under supervision of authority figures and that the activity they participate in is unstructured (which leaves more time and thus opportunity for other activities such as delinquency; Osgood et al., 1996).

Further, our findings indicate that routine activities may result in different types of delinquency through different processes. Vandalism seems to be especially opportunity driven, as its relationship with unstructured socializing is predominantly explained with exposure to temptations. The relationships between unstructured socializing and violence and theft, on the other hand, are (also) explained with exposure to delinquent peers and their normative influence. These findings contribute to a further understanding of previous work, which indicated that involvement in unstructured socializing was related to some types of delinquency, but not others (Miller, 2013; Müller, Eisner and Ribeaud, 2013).

The current study contributes to literature on the *social learning theory* by providing empirical evidence for pathways that have been explicated in that theory. The theoretical framework in the current study incorporates three processes and two sequential effects that were derived from social learning theory: Exposure to delinquent peers, exposure to group processes (delinquent reinforcement in particular), increased tolerance toward delinquency and sequential effects through delinquent peers and subsequent delinquency tolerance, and through reinforcement and subsequent delinquency tolerance. In line with social learning theory, we found that all three processes (exposure to delinquent peers, exposure to delinquent reinforcement and increased delinquency tolerance) were relevant in explaining the unstructured socializing-delinquency relationship, although only one of them had an independent explanatory effect after the sequential paths were allowed for in the model (exposure to delinquent peers). Furthermore, we found support for a sequential effect of unstructured socializing on delinquency through

exposure to delinquent peers and a subsequent increased tolerance toward offending, which is also in line with social learning theory (e.g., Akers, 1998; Akers and Jensen, 2006; Akers et al., 1979). The presence of this sequential effect indicates that individuals internalize attitudes that are acquired from their social environment. Our results were fairly consistent across the different types of delinquency (violence, theft and vandalism) and provided stronger support for the proposed pathway than was found in previous studies (Megens and Weerman, 2012; Reed and Rose, 1998; Reed and Rountree, 1997). For a second sequential effect derived from social learning theory we did not find support: Exposure to delinquent reinforcement did not significantly affected delinquency through shifting attitudes toward delinquency. This is contrary to the sixth statement of the social learning theory as formulated by Burgess and Akers (1966).

The lack of support for a sequential effect through delinquent reinforcement and subsequent attitude shifts can be interpreted as supportive of short-term processes where adolescents adjust their behavior to that of their peers without changing their own attitudes. Such processes are in the conformity literature referred to as 'public compliance' and more elaborately described by Warr (2002). The presence of short-term peer influence processes in situations of unstructured socializing is further supported by our findings regarding a sequential path through exposure to delinquent peers and subsequent exposure to delinquent reinforcement. The support for this path is consistent with the idea of present peers as an 'appreciative audience' (Osgood et al., 1996) and with the situational inducement perspective of Briar and Piliavin (1965).

Thus, our findings provide evidence that both short-term processes (of exposure to delinquent reinforcement as well as exposure to temptations) and long-term processes (of acquiring attitudes from the social environment) explain the relationship between involvement in unstructured socializing and adolescent delinquency.

Important to point out here, is that *delinquent reinforcement* of peers may work short-term as well as long-term in promoting delinquent behavior. Reinforcement affects delinquency in the long-term if social rewards provided by peers (in the form of positive reinforcement) stimulate adolescents' tolerance toward delinquency. We do not find support for the proposed long-term effects through delinquent reinforcement, as exposure

to delinquent reinforcement does not seem to stimulate delinquent behavior through increased tolerance toward delinquency. On the other hand, peer reinforcement can be viewed as a situational inducement that has short-term influence on delinquent behavior. We *do* find evidence for the proposed short-term effects of peer reinforcement, in the form of a sequential effect through delinquent peers and subsequent exposure to delinquent reinforcement.

Our findings have implications for *studies on the interaction between individual traits such as impulsivity or self-control and environmental immediate cues or 'opportunity'*, for which unstructured socializing is often applied as proxy (Hay and Forrest, 2008; Simons et al., 2014; Thomas and McGloin, 2013; Wikström et al., 2012a). The expected direction of this interaction is that individuals with low self-control or high impulsivity will be more likely to respond to situational cues provided in 'crime conducive' situations such as unstructured socializing. For example, Thomas and McGloin (2013) argued that adolescents who rely predominantly on the 'slow' cognitive system (adolescents who are low impulsive) are more likely to respond to long-term normative peer processes, whereas adolescents who rely predominantly on the 'fast' cognitive system (adolescents who are highly impulsive) are likely to be influenced by short-term situational peer process present in situations of 'informal socializing with peers' (a measure for unstructured socializing). The problem with using unstructured socializing as a proxy for 'situational peer processes' or 'opportunity' in studying these interactions is that the effect of unstructured socializing on delinquency is *not solely situational*. As indicated by the current study, involvement in unstructured socializing has also long-term effects on delinquency through exposure to delinquent peers and the adoption of delinquency favoring attitudes from those peers. Involvement in unstructured socializing thus potentially affects the behavior of *all* individuals, regardless of their level of self-control or impulsivity. As a matter of fact, no activity may have solely situational effects on behavior if one operationalizes it at the individual level as 'general involvement in that activity' and relate it to 'general involvement in delinquent behavior' of that individual. Socialization occurs in a chain of situational processes: Individuals who are repeatedly exposed to the same situational influences may experience influences on their long-term development and future behavior.

Based on these arguments and the findings of the current study, we suggest to expand our thinking about unstructured socializing and other routine activities by acknowledging that (leisure) activities are situations that provide opportunities for delinquency (or positive behavior) and at the same time form a social context for such behavior. We argue that the situations in which adolescents spent their leisure form a *behavior setting* (Barker, 1968) and should be further investigated as such. Behavior settings are “extra-individual units with great coercive power over the behavior that occurs within them” (Barker, 1968: 17). They incorporate ‘standing behavior patterns’ (extra individual behavior phenomena) that explain why adolescents would conduct behavior in a setting of unstructured socializing that they would not conduct in another entity of the ecological environment, such as in the classroom or at home with their parents (Barker, 1987; Barker et al., 1978; Barker and Wright, 1955). Behavior objects in unstructured socializing settings are the present peers, present others who are not directly involved in the activity (e.g., store manager of the supermarket where they hang out in front of) and elements of the physical environment where unstructured socializing occurs (e.g., a nearby trash bin). The peers are thus part of the setting; they are “interchangeable and replaceable” and contribute to an ecological atmosphere that persists after they leave the setting (Barker, 1968). Criminology may benefit from a behavioral setting approach in its understanding of how environments influence individual behavior. Although the measurement and operationalization of behavior settings has been rather difficult and expensive in the past (Scott, 2005), it becomes increasingly feasible with the emergence of (space) time diary methods (Chapter 3, appeared as Hoeben et al., 2014; Wikström, Treiber, and Hardie, 2012c). Therefore, we believe that consideration and further scrutiny of the concept of behavior settings may be very beneficial in future research on the intersection of routine activities, social relations and (delinquent) behavior. More research is needed to identify conditions that specify the ‘risk’ of an activity, over and above the nature of the activity itself and of the people who are present.

Limitations and future research

The extensive information about daily activities of the SPAN respondents derived from the space-time budget interviews, and the rich pool of items on potential mediating variables made the SPAN data particularly useful for examining our research question. Nevertheless, the current study has limitations that will be addressed in this paragraph.

First, the longitudinal data incorporate two moments of observation with a time-lag of approximately two years in between. This time-lag may be too short to study development among adolescents, but may be too long to study the explanatory processes from a situational perspective. To truly fathom the relevance of the different processes, the current study needs to be replicated with situational data as well as with data that cover a longer part of adolescence (see for example the study of Lam, McHale, and Crouter, 2014).

Second, the operationalization of the processes could be improved upon in future studies. 'Exposure to opportunities for delinquency' was operationalized with perceived temptations and provocations, whereas the concept of 'opportunity' is much broader and might require additional information on, for example, deterrence or the presence of guardians or place managers (Felson, 1995; Spano and Freilich, 2009). Absence or presence of 'delinquent reinforcement' (the first variable representing 'exposure to group processes') in situations of unstructured socializing could be more accurately determined, for example in experimental studies that focus on adolescents' reactions to each other's deviant talk (see Dishion et al., 1996; Patterson, Dishion, and Yoerger, 2000). The construct of 'peer influence toward conformity' (the second variable representing 'exposure to group processes') was expected to relate positively to delinquency, but did not significantly associate with any of the dependent variables (with a negative tendency for associations with general delinquency and violence). This unexpected result may be due to the ambiguous nature of our measure of group conformity: If the group is prosocial, it will supposedly evoke conventional behavior, whereas an antisocial group will evoke deviant behavior. The construct also has a relatively low Cronbach's alpha and may be improved when more items are added, as it now consists of three items. We suggest the 'susceptibility to peer influence' scale from Meldrum, Miller, and Flexon (2013) as an improved measure. The 'tolerance toward

delinquency' measures (rule breaking tolerance, substance use tolerance and offending tolerance) could be extended with items from Bandura's moral disengagement scale (Bandura et al., 1996). Furthermore, the current study applies a conventional measure for 'exposure to delinquent peers,' in which respondents are asked about behavior of their friends. Studies on network-generated data, in which friends report about their own behavior, showed that conventional measures overestimate the association between peer delinquency and adolescents' delinquent behavior (Weerman and Smeenk, 2005; Young et al., 2015), which implies that the mediation effect of 'exposure to delinquent peers' may be overestimated in the current study. Because of the imperfect operationalization of the explaining processes, the results of the current study should be interpreted as a first step toward elaborating the unstructured socializing-delinquency relationship. Further exploration may benefit from improvement of the measures.

The current study did, of course, not examine all associations that are relevant to the unstructured socializing-delinquency relationship. There are at least a few associations that need to be scrutinized in future research. First, the current study focused on the processes *through which* involvement in unstructured socializing influences delinquency behavior, rather than on the *conditions under which* unstructured socializing relates to delinquency. Several processes of *moderation* may be relevant in the proposed framework are. For example, the unstructured socializing-delinquency relationship may be stronger if delinquent peers are present (Haynie and Osgood, 2005; Svensson and Oberwittler, 2010), or if adolescents have tolerant attitudes toward delinquency. One can also think of moderation of one of the direct paths in the model: The path from unstructured socializing to perceived temptation may be stronger when adolescents perceive delinquent reinforcement. Additionally, previous studies have found that demographics (e.g., gender, age, education) and other individual characteristics (e.g., self-control, moral emotion) moderate the unstructured socializing-delinquency relationship (Augustyn and McGloin, 2013; Hay and Forrest, 2008; Wikström and Svensson, 2008).

Second, further research is needed to investigate the extent to which involvement in unstructured socializing mediates the influence of other predictors on delinquency, such as parental monitoring (Osgood and Anderson, 2004), age, sex or socioeconomic status (Osgood et al., 1996).

Third, whereas the current study proposes involvement in unstructured socializing as a cause of delinquent behavior, exposure to delinquent peers and tolerance toward delinquency, other studies have indicated opposite directions of these or similar relationships (e.g., Bernburg and Thorlindsson, 2001; Müller, Eisner, and Ribeaud, 2013; Vásquez and Zimmerman, 2014). The current study leaves out of account processes such as social selection, where delinquent behavior affects the future selection of friends, and rationalization, where delinquent behavior evokes neutralization processes that affect attitudes toward delinquency (Reed and Rose, 1998; Reed and Rountree, 1997).

We considered the examination of reciprocal effects, moderation effects and predictors of unstructured socializing to be beyond the scope of this study, but they may be fruitful directions for future studies.

Concluding remarks

This study responded to the call from Agnew (1995: 364) for “an explicit focus on motivational processes” that explain why predictors relate to delinquent behavior. In previous empirical studies, we have come to know ‘involvement in unstructured socializing’ as a powerful predictor of adolescent delinquency. However, as Agnew (1995) argued, only the investigation of motivational processes will help us understand *why* these and other factors are related to delinquent behavior. The current study strongly suggests that involvement in certain activities evokes situational processes (as argued in routine activity theory) as well as socialization processes (as elaborated in social learning theory) that offer short-term as well as long-term explanations for delinquent behavior. Replication of our findings and further exploration of explanatory processes are necessary to obtain more information on the intriguing association between ‘risky’ leisure activities and adolescent delinquency.

Appendices Chapter Two

Appendix 2A. Items measuring variables representing the proposed processes

Supplementary material

(enclosed in a separate document available from the author):

Appendix 2B. Factor loadings and alpha reliabilities for delinquency

Appendix 2C. Factor loadings and alpha reliabilities for dimensions of the explanatory processes

Appendix 2D. Zero-order covariances and correlations

Appendix 2E. Results at between-individual level general delinquency

Appendix 2F. Results for violence

Appendix 2G. Results for theft

Appendix 2H. Results for vandalism

Appendix 2I. Results with strict definition of 'unstructured activity'

Appendix 2A

Table 2A.1. Items measuring variables representing the proposed processes

Processes	Variables	Items
Exposure to opportunities for delinquency	Perceived temptation	When was the last time you felt tempted to... Steal from a shop/ destroy or damage something/ hit someone/ break into a car to steal something. Last week/ last month/ last year/ longer than a year ago/ never been tempted.
	Perceived provocation	How often... are you being scoffed at/ do people start an argument or quarrel with you/ are you being provoked into a fight/ do you feel that others disrespect you/ do people treat you badly. Never/ sometimes/ frequently (every month)/ often (every week or every day).
Exposure to group processes	Delinquent reinforcement	When I would do something that is not allowed, my friends find it quite funny/ When I'm with friends I break the rules more often than when I'm alone/ I will stick with my friends, even if they do something dangerous/ if my friends would get into contact with the police, I would lie for them to protect them. YES/ yes/ yes or no/ no/ NO!
	Peer influence toward conformity	Sometimes, my friends make me do things that I don't really want to do/ My friends would find it uncool when there is something that I don't dare to do/ My friends think it's OK when I don't dare or want to do something. YES/ yes/ yes or no/ no/ NO!
Increased tolerance toward delinquency	Rule breaking tolerance	How bad do you think it is when someone of your age does the following- Bicycling through red light/ skip homework/ skip school without excuse/ lie, disobey or talk back to teachers/ skateboarding where it is not allowed/ bully a classmate because of how he or she dresses/ steal a pencil from a classmate. Very bad/ bad/ a little bad/ not bad at all.
	Substance use tolerance	How bad do you think it is when someone of your age does the following- Smoke cigarettes/ get drunk on a Friday evening/ smoke soft drugs. Very bad/ bad/ a little bad/ not bad at all.
Exposure to delinquent peers	Offending tolerance	How bad do you think it is when someone of your age does the following- Paint graffiti on a house wall/ smash a street light/ steal a CD from a shop/ break into a building to steal/ use a weapon or force to get money or things from another young person. Very bad/ bad/ a little bad/ not bad at all.
	Delinquent peers	How often do your friends... Skip school without excuse/ get drunk/ use drugs/ steal something from others or from shops/ destroy things/ beat up or get into fights with others. (Almost) never/ sometimes/ often (each month)/ very often (each week).



Part II.

Measuring the Setting of
Unstructured Socializing





Chapter Three.

Space-Time Budgets

Hoeben, Evelien M., Wim Bernasco, Frank M. Weerman, Lieven J.R. Pauwels, and Sjoerd van Halem. 2014. The space-time budget method in criminological research.

Crime Science 3(12): 1-15.



Space-Time Budgets

*How we spend our days is, of course,
how we spend our lives – Annie Dillard*

This chapter reviews the space-time budget method developed by Wikström et al. (Wikström and Butterworth, 2006; Wikström et al., 2012a) and particularly discusses its relevance for criminological research. The space-time budget method is a data collection instrument aimed at recording, retrospectively, on an hour-by-hour basis, the whereabouts and activities of respondents during four days in the week before the interview. The method includes items about criminologically relevant events, such as offending and victimization. We demonstrate that the method can be very useful in criminology, because it enables the study of situational causes of crime and victimization, because it enables detailed measurement of theoretical concepts such as individual lifestyles and individual routine activities, and because it enables the study of adolescents' whereabouts, which extends the traditional focus on residential neighborhoods. The present chapter provides the historical background of the method, explains how the method can be applied, presents validation results based on data from 843 secondary school students in the Netherlands and describes the methods' strengths and weaknesses. Two case studies are summarized to illustrate the usefulness of the method in criminological research. The chapter concludes with some anticipated future developments and recommendations on further readings.

Time use measurement and space-time approaches in geography and social sciences

Time use instruments record systematically how individuals allocate their time to activities over a given time period. They enable researchers to collect

data on the duration and sequence of activities, for example per hour or per day. The first publications on time use appeared over a century ago and grew out of studies on family monetary budgets. These early studies addressed, for example, the spare time of American working men (Bevans, 1913) and family life in English households (Pember Reeves, 1913). Most pre-World War II time use studies concerned living conditions of working class households during the rise of the industrialization or were undertaken against the background of economic planning in the Soviet Union. In the 1950s and 1960s, time use research was often applied in the study of free time and forms of leisure, for example the amount of television consumption (see early overviews of Andorka, 1987; Chapin, 1974; Robinson and Converse, 1972; Szalai, 1966).

A milestone in the standardization of time use measurement was the Multinational Comparative Time-Budget Research Project in the 1960s (see Szalai, 1972). To enable cross-national comparison of time use, Szalai and colleagues developed methods for sampling, interviewing, coding and data processing that were implemented in all twelve participating countries. These methods and instruments shaped most of the subsequent time use studies (Harvey and Pentland, 1999: 6; Michelson, 2005: 12).

Time use studies have now appeared on a variety of topics and in a variety of fields. Recent overviews mention time use studies within economics, business administration, gerontology, urban planning, political science and occupational therapy, nursing and medicine, recreation and physical and health education, sociology, anthropology and psychology. Just to give a few examples: In economics, time use data is applied for investigating poverty (e.g., whether individuals have too many obligations to enjoy leisure) or the time spent on paid work relative to 'non-market productive' time such as time spent on domestic activity, education or child care. Health studies and studies in gerontology apply time use data to investigate active and sedentary behavior and time use by older people and people with disabilities. Sociologists apply time use data to study, for example, the gender division of domestic work or the quality of life associated with discretionary time. Studies on urban planning apply time use data to investigate the traffic flow to a city center that is associated with people commuting to work (overviews are given by Fisher and Gershuny, 2013b; Michelson, 2005; Pentland et al., 1999). Time use research has appeared in several countries, and some of the nationally representative studies are repeated every five to ten years (e.g. in

the Netherlands, Japan, Canada and Norway; Harvey and Pentland, 1999: 7). These national studies are, for example, applied to gain knowledge on daily routines of inhabitants, their involvement in sport activities or voluntary work, and the amount of time people spend on paid work. This massive body of time use studies is mostly organized within a few large projects. The most comprehensive of these is the Multinational Time Budget Study (Fisher and Gershuny, 2013a). Other extensive initiatives include the Eurostat Time Use project (Eurostat, 2009) and the American Time Use Study (ATUS, 2013). Time use researchers of various disciplines are organized in the International Association for Time Use Research (IATUR, 2011), which has its own journal (eIJTUR, 2004) and annual meeting.

Space-time budget instruments extend time use instruments by incorporating information on the spatial coordinates of locations where activities take place. Space-time budget studies originate from time use research: In the 1960s and early 1970s travel researchers started to address temporal constraints on spatial behavior and at the same time, time use researchers recognized the need to integrate spatial elements in their studies (see Anderson, 1971; Carlstein, Parkes, and Thrift, 1978). This new approach of integrating temporal and spatial elements, often referred to as the ‘activity-based approach’, is largely grounded on the work of Torsten Hägerstrand (1970, see Corbett, 2001). Pioneering studies that attached geo-coded locations to time diaries were, among others, the Washington studies described by Chapin (1974), the Halifax time-budget study (Elliott, Harvey, and Procos, 1976), and a study conducted in Hamburg (Germany; Dangschat et al., 1982). See Kitamura (1988), Kurani and Lee-Gosselin (1997), Bhat and Koppelman (1999) and Harvey (2003) for overviews of space-time budget research.

Methods for time use measurement

Several methods have been developed to measure (space-)time use. The most straightforward way is *stylized questioning*: Asking respondents how much time they spend in certain activities in, for example, ‘an average week’. Although this method is relatively inexpensive and replicable (it is found to accurately measure change and stability in time use within populations, Juster, Ono, and Stafford, 2003), there are several problems associated with stylized

questioning. First, since respondents are asked to aggregate the details of their time, their answers may be affected by memory problems (Juster, Ono, and Stafford, 2003). They may not recall all activities, or they may find it difficult to estimate episode lengths across the day. Some activities are easier to reconstruct than others (e.g., ‘How many hours did you spend at school?’ is easier to answer than ‘How many hours did you watch television?’). Social norms (e.g., about the 40-hour work week) may further alter respondents’ memory about their actual time allocation (Robinson, 1999). Second, respondents’ answers will vary with individual interpretation. For example, some respondents will incorporate time spent on commuting and lunch break in their notion of ‘work’, whereas other will not. Third, respondents are likely to experience difficulties with separating main activities from other activities if several activities take place simultaneously (Robinson, 1999). Fourth, the data provided by stylized questioning are limited in scope. They contain the total amount of hours per time period spent in each activity, but they do not provide, for example, information on the time of day and the order in which the activities were performed.

The *time diary* method deals with (most of) these problems. Lundberg, Keonavouski, and McInerny (1934) are often credited as methodological pioneers for this method. The method implies the recording of every (main) activity during a given time period. A time diary, also called ‘time budget’, can be completed through retrospective questioning (‘yesterday basis’), but also by asking respondents to keep a log of their activities (‘tomorrow basis’) during a given period (e.g., 24 hours or a week). A specific feature of the time diary method is that respondents can use their own terminology when describing their activities, which reduces possible bias due to interpretation differences between respondents. Furthermore, time diaries make it possible to analyze activities in their geographical and social context, because the method leaves room to include information on, for example, the location of the activity, who else were present or the respondents’ emotional state (Harvey and Pentland, 1999). Disadvantages of this method are that it requires more effort from interviewers and analysts to categorize the self-reported activities, that the interviews (therefore) usually take up more time compared to self-reported questionnaires, and that it may underestimate secondary activities and activities that take up little time or little attention, such as ‘trying to find things’ (Robinson, 1985). Ås (1978) formulates the

following choices that researchers should make if they want to apply time diaries in their data collection: a) Are fixed time intervals used, or should the respondents indicate the start and end times of an activity?; b) If fixed time intervals are used; what is the duration?; c) Do you ask about locality and social interaction in addition to the activity?; d) Do you record secondary activities alongside the primary ones?; e) For what lengths of time do you need to ask the respondents about their activities (e.g., a daily cycle, a week, if not a week: weekend days as well as week days)?

The space-time budget method developed by Wikström is, in fact, largely based on the time diary method. Wikström et al. (2012a: 69) argue in line with the work of Robinson (1985) that time diaries are superior to other methods for time use measurement in terms of reliability and validity. We will discuss the decisions regarding the development of the space-time budget method in the subsequent sections. For more information on time diaries in general (not the space-time budget method particularly), see Belli, Stafford, and Alwin (2009) for a recent and thorough discussion.

The *experience sample method* gives respondents signals at random moments throughout the day through their digital watch, electronic pager or, more recently, their mobile phone. At that particular moment, respondents are asked about their current activity. This method enables the recording of brief activities that are underreported in the time diary approach, because they would be difficult to recall at a later point in time. Also, this method enables the recording of more detailed information on descriptors that vary across the day, such as affective or physiological states (Juster, Ono, and Stafford, 2003). Disadvantages of the method are that the method is found to underreport activities that respondents are reluctant to interrupt such as sports activities (Csikszentmihalyi and Larson, 1987) and that the method records activities out of their (temporal) context: No information is collected on activities performed in the period before and after the signal (Harvey and Pentland, 1999).

Another method of collecting data on time use is to obtain and analyze *secondary data from the 'supply side'*. Facilities such as museums usually keep records of their visitors and this enables, for example, the study of museum visits in weekends (Harvey and Pentland, 1999). Similarly, with *on-site verifications*, researchers count the number of people at a particular site at a particular time, for example in parks or at school (Robinson, 1999). This

method is mostly location oriented and less useful for studying individual behavior across time.

Direct observation is a method in which researchers follow, observe and record the activities and social contacts of respondents. This method is very time consuming and nearly only feasible for short time spans in restricted areas. It may therefore not be useful if one is interested in (large) representative samples (Ås, 1978). Less time-consuming is an adjusted form of the method; *spot sampling*, or ‘random observation’, where observations are conducted at randomly chosen times across the day (Larson and Verma, 1999: 704).

Space-time (budget) research in criminology

Although the previous sections illustrate the time use instruments in *geography and social sciences* on which Wikström’s space-time budget instrument was inspired, related instruments and measures have been used in *criminological research* as well. Since the current chapter is specifically focused on the application of the space-time budget method for *criminological* research, we will first briefly discuss these projects before reviewing the instrument developed by P-O. Wikström.

In a survey amongst adolescents, Riley (1987) included a time budget of the Saturday before the interview to measure activity patterns and relate them to delinquency. The stylized questions included in, for example, the studies of Osgood et al. (1996) and Agnew and Petersen (1989), do not represent time budgets but are also meant to measure details about activity patterns and relate them to deviant or delinquent behavior. An altogether different approach, aimed to estimate activity based measures of victimization risk, was followed by Lemieux and Felson (2012). They combined national level data from the USA National Crime Victimization Survey (NCVS) and the American Time Use Survey (ATUS) to calculate activity based victimization risks of violent crime. The Los Angeles Family and Neighborhood Survey (L.A. FANS; Sastry et al., 2006) collected, among other things, geographical information on the key places in respondents’ daily activities and information on their substance use, crime and violence. The Space-Time Adolescent Risk Study (STARS) in Philadelphia is aimed to collect data on the nature and location of adolescents’ activities combined with their risk of being assaulted

(e.g., Basta, Richmond, and Wiebe, 2010). An early application of the geographic aspect of space-time use measurement is the study of Rengert and Wasilchick (2000), who asked burglars to reconstruct a 'journey to burglary' by describing places visited and activities performed on the day of a recent burglary. An interesting contemporary example is provided by Rossmo, Lu, and Fang (2012), who collected very detailed geographic data recorded by automated monitoring systems used in an electronic monitoring community corrections program. These data enabled the researcher to reconstruct the geographic details of journeys to crime committed by parolees who were in the program.

The space-time budget (STB) method as developed by Wikström is the first in criminology that aims to collect data on a large scale with time diaries enriched with geo-coded locations. This methodology offers new opportunities to study the influence of social environments on individual offending and victimization, because it measures more precisely the exposure to environments that is associated with individual routine activities together with the risk of getting involved in law-breaking behavior (Wikström, 2007). An additional innovative feature of this method for criminology is namely that it includes criminologically relevant items, among which offending and victimization.

The space-time budget (STB) method was piloted in the Peterborough Youth Study (PYS; Wikström and Butterworth, 2006) and refined in the Peterborough Adolescent and Young Adult Development Study (PADS+; Wikström et al., 2010; Wikström et al., 2012b). The Peterborough Youth Study (PYS) took place between the autumn of 2000 and early summer of 2001 among college students of 14 to 15 years old (year 10 in school). The first STB interviews covered seven days before the interview (all days of the week, including Sunday). As temporal unit of analysis, it was chosen to apply fixed time units of an hour. Wikström et al. (2012a: 73-75) argue that "the exact timing of activities" is of less interest in their study and that "an hour is specific enough to capture the diversity of places and activities in which young people spend their time, while maintaining the focus on where they spend *most* of their time and their *main* activities" Hours are considered to be units that are "easily quantified and interpreted". Moreover, the researchers felt that more temporal detail would affect the reliability of the data due to recall problems (Wikström and Butterworth, 2006: 208) and would extend

the duration of the (already lengthy) interviews (Wikström et al., 2012a: 75). The choice for the unit of analysis defined the focus on primary activities, secondary activities may be underrepresented. This problem is largely avoided for a few main items of interest that are also often secondary activities, by asking the respondents specifically about involvement in crime events or other incidents. Since this approach is time consuming, it can only be applied for a few activities. In addition to their hourly activities, respondents were also asked about the location of that activity and who else was there. Wikström et al. (2012a: 73) argue that “this combination of codes is central to the space-time budget methodology”, because only the combination of the components (location, people present, activity and time) captures “the detailed circumstances of settings”. As spatial unit of analysis, Wikström, Treiber, and Hardie (2012c: 117) argue that smaller is better, since “data can always be aggregated”. The smallest available unit for official data may differ per country. Wikström and colleagues selected output areas that incorporate approximately 125 households, because these were the smallest spatial units available for official data in the United Kingdom. Preliminary analyses of these first STB data mainly addressed where adolescents spent their time (at school, at home, on the street), how they allocated their time over, for example, school, leisure and transportation and with whom they spent their time (Wikström and Butterworth, 2006). The findings showed, among other things, that the individual routine activity patterns differed by individual risk-protective scores, area of residence and school structural risk scores.

The Peterborough Adolescent and Young Adult Development Study (PADS+) now consists of seven waves of data collection (collected between 2004 and 2012), with three more waves scheduled for the coming years. Respondents were 11 to 12 years old in the first wave. At the time of the fifth wave, no less than 693 of the 716 respondents who participated in the first wave still participated in the study (Wikström, Treiber, and Hardie, 2012c: 112). The STB method applied in PADS+ differs somewhat from the method applied in PYS. In PADS+, four days are questioned, whereas seven days were covered in PYS. The restriction to four days instead of seven was made to limit demands on the memory of respondents, since activities are recorded retrospectively (Wikström et al., 2012a: 71). Wikström et al. (2012a: 70) make a case for this decision by referring to findings of the American Time Use Survey that activities between Monday and Thursday are essentially similar.

They further argue that Friday and Saturday evenings differ substantially from other evenings. Sunday evenings are assumed to resemble school day evenings, because they are characterized by preparations for the school week. Sunday is therefore not incorporated in the STB interview. The code lists for activities, locations and present people were adjusted based on experiences from the PYS. Also, the STB interview and questionnaire are held preferably at the same day for one respondent, whereas in the PYS there was a gap of six months between these interviews. In 'Breaking Rules' (Wikström et al., 2012a), one of the main publications on the PADS+ data, the STB data of the first five waves are used to describe adolescents' spatial activity patterns and their involvement in family-oriented, school-oriented, work-oriented and peer-oriented activities. Central in the book are the interrelations of crime patterns, activity patterns ('exposure to criminogenic settings') and 'crime propensity' (morality and self-control) of the individual, based on situational action theory. In a nutshell, this theory proposes that an act of crime is an outcome of a perception-choice process that occurs when individuals are exposed to temptations and provocations in the environment. The theory aims to explain why crime occurs by investigating the characteristics of these individuals (particularly their crime propensity) and the features of the environments in which they take part (e.g., Wikström, 2014). The theory also aims to explain why certain kinds of people commit crimes and why certain kinds of areas come to have higher crime rates than others, by explicitly focusing on the interaction of situational, social and developmental mechanisms. Furthermore, the theory distinguishes between causes of crime and causes of the causes of crime and in doing so the theory distinguishes between crime and criminality.

The space-time budget (STB) method is adopted in three research projects that collaborate with the PADS+ project: SPAN in The Hague, the Netherlands, MINDS in Malmö, Sweden, and SPMAD in Ljubljana, Slovenia. The Adolescent Health and Development in Context study in Ohio incorporates a somewhat altered version of the PADS+ space-time budgets. These space-time budgets are, for example, organized around stable location periods and travel periods instead of around fixed one hour time units (Browning et al., 2014; Browning and Soller, 2014). Townshend and Roberts (2013: 499) state that their 'weekend activity diaries' are based on the space-time budgets of Wikström and colleagues, but nevertheless apply a method

that differs in several aspects.

Empirical criminological studies, published in English, that use data derived with the space-time budget method as developed by Wikström and colleagues are the studies of Wikström and Butterworth (2006), Wikström (2009), Wikström et al. (2010), Ceccato and Wikström (2012), Wikström et al. (2012a), Weerman et al. (2013), Bernasco et al. (2013a; 2013b), Wikström (2014), Hoeben and Weerman (2014; Chapter 5), Janssen, Deković, and Bruinsma (2014) and Averdijk and Bernasco (2014).

What does the method entail?

The space-time budget (STB) method as developed by Wikström and colleagues, applies a time diary approach to collect data on activities and whereabouts of adolescents. In one-to-one personal interviews, respondents are questioned retrospectively about four days. For every hour (fixed time unit), they are asked about their primary activity, the location where the activity took place (both functional, such as school, and geographical, such as where in The Hague), whom the respondent was with and whether the respondent experienced ‘extra incidents’, such as involvement in fights. Respondents answer in their own words, and these answers are coded by the interviewer during the interview. Figure 3.1 shows the STB form as used in the SPAN study, but translated to English. This form is completed by the interviewer using a laptop.

The first column of the STB form in Figure 3.1 (‘act’) refers to *activity*, for example ‘studying at school’ or ‘playing soccer’. Some activities can be coded quite fast, because they continue for multiple hours (e.g., sleeping). If more than one activity takes place in an hour, interviewers may ask the respondent which activity he or she considers the main activity (either because it took the most time or because it was most important to the respondent). If the respondent is involved in two activities at the same time during two or more hours, one activity can be coded for the first hour and the other activity for the second hour. This strategy can also be applied across multiple days: If a respondent starts every weekday with an hour of simultaneously having breakfast and watching television, the activity in this hour can be coded as ‘having breakfast’ for the first day and as ‘watching television’ for the second day.

The second column of the STB form in Figure 3.1 ('place') refers to the *function of the location* where the activity took place, for example 'home,' 'at a friend's house' or 'supermarket'.

The third column ('geo') refers to the *geographical location*. The geographical location is coded by using detailed maps that show small units in the research area. In the PADS+ study, the units are 'output areas,' which are the smallest available administrative units defined in the census of the United Kingdom. In the SPAN study, the units are cells of 200 by 200 meter (656 by 656 feet) in a grid overlaying the study area. Thus, they are determined independently of the administrative neighborhood boundaries defined by the municipality. See Figure 3.2 for examples of these units in the SPAN research area. To help respondents navigate through the detailed map, interviewers use special city maps that include alphabetical lists of street names and corresponding page numbers of the detailed map. The interviewers usually start with geographically coding the respondents' home address and work from there during the rest of the interview. For hours that are spent travelling (e.g., by bus, car or bike), the geo-code of the departure area is noted. For hours spent otherwise moving (for example, by walking around with a group of peers), the geo-code of the unit where they spent most of the time is noted.

The fourth, fifth and sixth column on the STB form in Figure 3.1 address *the people present in the setting*, specified in terms of their relation with the respondent. 'Family' members include parents, siblings or other family members such as uncles or aunts. 'Peers' include friends, classmates, teammates or a partner. Also specified is whether one peer is present or two or more peers, and whether they are male, female, or a mixed group. 'Others' include teachers, trainers, coworkers or parents of friends. In the latest waves of the PADS+ study, in which some of the respondents have become parents themselves, their own children are included as a separate category of people present.

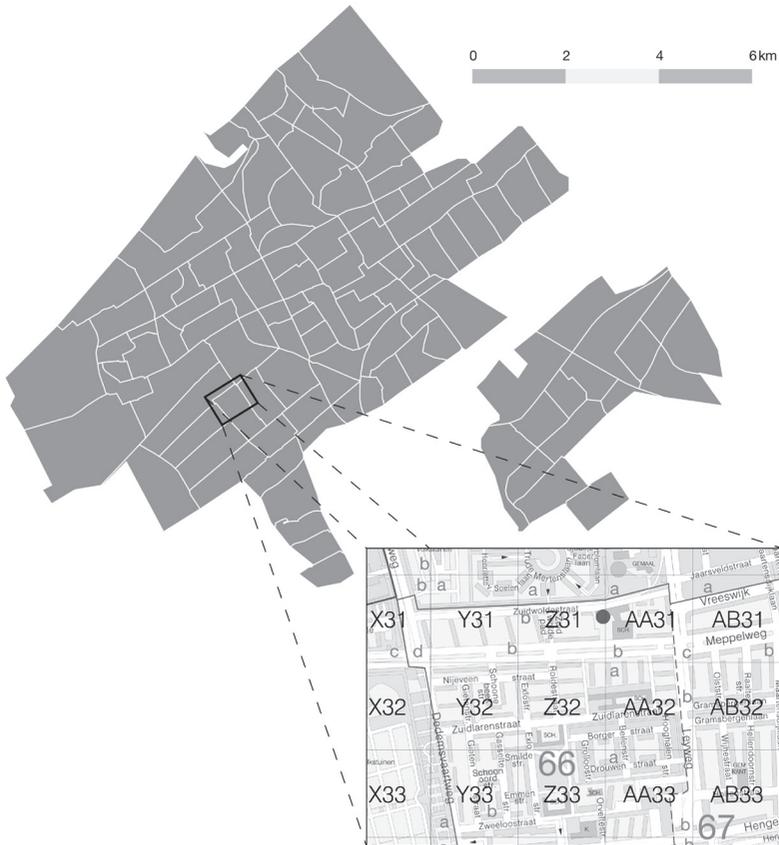


Figure 3.2. Maps for determining geographical location

NOTES: The Figure shows the SPAN research area (The Hague, the Netherlands) and within that research area the units of 200 by 200 meter (656 by 656 feet) that correspond to the ‘Geo’ column in the space-time budget form (Figure 3.1). For example, Z32 refers to a unit of 200 by 200 meter.

Finally, the ‘truancy’ and ‘extra incidents’ columns in the STB form in Figure 3.1 leave room to register *truancy*, *substance use* (alcohol and drugs), witnessing or involvement in *risky situations* (e.g., fights, provocations, police contact), *victimization* (of theft, vandalism or violence), involvement as an *offender* (in theft, vandalism or violence), or *weapon carrying*. Contrary to the activity, location and presence of other people, these incidents are not probed per hour, since they are unlikely to occur every hour. At the end of coding

each STB day, interviewers ask: ‘Have you been playing truant during this day?’ ‘Have you used alcohol or drugs during this day?’ ‘Were you involved in fights, or have you witnessed fights or violence (from a distance) during this day?’ ‘Was something you possess stolen or broken? Has somebody beaten you, attacked you or did somebody start a fight with you?’ ‘Did you steal something or damaged something that belonged to someone else or were you involved in a fight?’ ‘Did you carry a weapon at some point during this day?’ If the respondent answers affirmative to any of these questions, the interviewer asks further details to code the time and specifics of the incident. Extra incidents are also coded if their duration is less than an hour. Up to three different incidents of each type can be registered per hour. If more than three incidents occur (which is very rare), general codes can be used to ‘group’ incidents. For example, there is a code for ‘consumption of a combination of soft and hard drugs.’ The use of these general codes should be explained in additional notes below the STB form.

Although the interviews are structured by the STB form in Figure 3.1, interviewers ask open questions and respondents answer in their own words. These answers are then coded by the interviewers, using long lists of activity-codes, location-codes, people present-codes and incidents-codes (comprehensive code lists are printed in Appendix A2 in Wikström et al., 2012a and Appendix B in Wikström and Butterworth, 2006). When in doubt on the right code, interviewers may consult the respondent on which code would best represent the specifics of their activities.

To prevent coding mistakes or typing errors, all completed STB forms need to be cleaned according to a strict protocol. Cleaning involves not only checking for missing entries, but also extended consistency checks. For example, the activity ‘sleeping’ is not a logical combination with a place code for ‘swimming pool’. Also, if a respondent went to bed at his parents’ house, it would be illogical that he or she woke up the next day somewhere else (or the interviewer missed an interesting story). We recommend that all STB forms are cleaned and corrected by the interviewer who conducted the interview and again by one of the other interviewers.

By design, the four days covered in the STB always need to incorporate one Saturday, one Friday and two random weekdays. The two random weekdays that are questioned alongside Friday and Saturday should be the most recent weekday before the interview and the most recent weekday

before that. The ordering in which the four days are recorded during the interview is allowed to vary. To obtain a representative overview of daily activities, interviews address 'normal' school or workdays as much as possible: If respondents were on holiday or ill at home, for example, they are questioned about another 'regular' day, with a maximum of seven days before the interview. If that is not possible, the days are recorded but a note is made on the STB form that they are 'abnormal' (see Figure 3.1).

Efforts to deal with memory problems include: Allowing the respondents to check their schedule book or mobile phone, making reference to previous activities (e.g., 'What did you do after basketball training?'), making reference to external memorable events, such as television shows or the weather, and as a last resort, asking respondents what they would normally do 'at such a day' or 'at that time of day'. If respondents experience difficulties to remember their whereabouts or to find their geographical location on the map, interviewers can help them by using geographical 'landmarks', such as the location of local shops, parks or the respondents' school or home address (Wikström, Treiber, and Hardie, 2012c: 123).

To avoid social desirable answering, respondents are allowed to just shake their heads or nod and point at the right code. The STB interviews should be conducted in a quiet area away from peers or authority figures, where respondents feel free to talk. Additionally, interviewers should be explicitly instructed to refrain from judgmental responses and to convince the respondents about the confidentiality of their answers prior to the interview. We recommend selecting interviewers based on skills such as social awareness, patience and conscientiousness. Most of the interviewers in the SPAN project just graduated or were still in college. Conform findings in the literature that both too much and too little respondent-interviewer social distance will produce biasing effects (Dohrenwend, Colombotos, and Dohrenwend, 1968; for an overview see Nederhof, 1985) we believe this age gap minimizes the tendency of respondents to provide social desirable answers.

The STB interview requires 45 to 50 minutes to administer. In the SPAN data collection, we experienced that the respondents generally liked the attention that interviewers showed to their daily schedule and that they were generally willing to cooperate. These experiences are in line with those of PADS+ (Wikström et al., 2010: 66-67; Wikström et al., 2012a: 77). The interviewers did not report fatigue among the respondents.

Two case studies

To illustrate the relevance of space-time budget method (STB) for criminological research, we discuss two case studies. The first study by Weerman et al. (2013) provides a case in which STB data from the SPAN study were employed to specify the influence of adolescent activity patterns on individual differences in delinquent behavior. In particular, they aimed to get an increased insight in the conditions under which spending time with peers is conducive to delinquency. Traditional studies used survey methods (stylized questioning) that measured how often respondents reported they were together with friends in general (e.g., Warr, 1993) or how often they thought they spent time with peers in certain activities (Osgood et al., 1996). Such measures are based on rather imprecise recall, not capturing detail about the conditions under which time is spent with peers. In contrast, the STB data of the SPAN study enabled to establish in much more detail where and with whom time is spent with peers, and what respondents are doing when they are with peers. In particular, these data enabled Weerman et al. (2013) to systematically contrast spending time with peers a) in physical as opposed to 'online' interaction, b) in public space as opposed to private space, c) unsupervised as opposed to supervised by adults d) just socializing as opposed to activity-based e) in settings with access to alcohol or drugs as opposed to settings without access to substances, and f) with a group as opposed to a single peer.

Analyses among 843 respondents showed that the association between time with peers and delinquent behavior is substantially different between conditions. It appeared that delinquency is rather strongly positively related to time with peers when it is spent in public, without supervision, just socializing or with two or more peers. However, time with peers 'online' or by phone, and time spent with peers supervised by adults, in non-public places, doing activities and with only a single peer, had a weaker or even an absent relation with delinquency.

The second study by Bernasco et al. (2013b) used the same SPAN data to identify causes of crime that can be attributed to situations rather than to persons. To eliminate all stable between person factors as potential confounds, they analyzed the STB data as repeated observations of the same person in different situations, with within-individual fixed effects analyses.

The STB instrument provides 96 observations for each respondent, because it records attributes per hour over four days. The analyses only included the hours awake (hours asleep were excluded) from the 76 individuals who reported having committed an offense during the STB days; these 76 individuals reported 104 offenses. The aim of the analysis was to assess in which type of situations the adolescents offended and in which situations they did not. For each hour, information was available on a) whether the situation included interaction with peers, b) whether adults were absent, c) whether the action took place in public space d) whether the respondent was involved in unstructured activities e) whether alcohol was consumed f) whether cannabis was used, g) whether the respondent carried a weapon, and finally h) whether the respondent perpetrated an offense.

Results showed that offending was strongly and positively related to all hypothesized situational causes except cannabis use and weapon carrying. For example, the presence of peers and the involvement in unstructured activities both almost doubled the odds of offending (odds ratios 1.96 and 1.93 respectively), the use of alcohol more than doubled it (odds ratio 2.32), the absence of adult handlers more than tripled the odds, and presence in public space increased the odds even by almost a factor 10 (odds ratio 9.92).

Strengths of the method

The space-time budget (STB) method can be applied in a variety of ways, for example to address questions on leisure activities (e.g., Larson and Verma, 1999) or shopping behavior, but also for health related studies that investigate exposure to risk associated with daily routines (see overviews in Fisher and Gershuny, 2013b; Michelson, 2005). The current chapter is particularly concerned with the relevance of the method for *criminological* studies. In this section, six ways are discussed in which the method may contribute to criminological research.

First, the STB method enables a detailed operationalization of individuals' lifestyles (Hindelang, Gottfredson, and Garofalo, 1978), routine activities (Felson and Boba, 2010; Osgood et al., 1996) and exposure to behavior settings (Barker, 1968; Wikström et al., 2012a). Previous studies showed that individuals underreport leisure activities when questioned on activities over

longer periods of time (Niemi, 1993; Robinson and Godbey, 1999) and that stylized questioning is plagued by several other problems (Robinson, 1999), which may give a distorted account of individuals' general activity patterns. These problems are partially solved by the structured questioning per time unit or activity episode as implemented in the time diary approach, and by its feature of letting respondents report in their own words.

Second, the STB method collects information on criminological relevant items such as substance use, truancy, weapon carrying, offending, victimization and other incidents (e.g., fights). These 'rare' events occur in small timeslots and are, more than other activities, prone to social desirable answering. They may therefore be underreported in other time use instruments. The STB method attempts to deal with these problems by asking specifically about these items for every day that is covered. The questions refer to every type of incident, thereby attempting to avoid recall problems and interpretation problems.

Third, because the method collects information on activities and contextual specifics per small time unit (an hour), it enables the study of situational contexts for crime or victimization directly, as illustrated by the previously described case study (Bernasco et al., 2013b; see also Averdijk and Bernasco, 2014). This small time unit also enables the study of activity sequence (e.g., which activities precede criminal activity and which activities follow substance use?) and of temporal correlations (e.g., do crimes occur more often in the weekends than during the week, or more often in the evening than during the day?).

Fourth, the geographical information on the location of the respondents (the 'geo' column in Figure 3.1) enables the investigation of environmental influences of locations where adolescents spend their time over and above the investigation of environmental influences from their community or neighborhood of residence. Analyses of STB data showed that adolescents spent more than fifty percent of their time awake outside the direct surroundings of their home and that 90 percent of the reported crimes occurred while away from the direct home environment (Wikström et al., 2012a: 68). This demonstrates the relevance of studying environmental influences outside of the residential neighborhood.

Fifth, combining the geographical information on the location of respondents from the STB with geographical information from other

(secondary) sources (preferably on small units, Wikström, Treiber, and Hardie, 2012c), enables the study of a variety of ecological criminological theories at the individual level. Scholars can, for example, analyze whether the time that an individual spends in communities with low collective efficacy (Sampson, Raudenbush, and Earls, 1997) is related to increased involvement in delinquency. Examples of complementary data sources are community surveys, census data from local governments, police information on geo-coded offenses, and systematic social observations (SPAN data sources are described in Bruinsma et al., 2013 and Janssen, Deković, and Bruinsma, 2014).

More generally, although the method was specifically developed to inform and test situational action theory, its focus on situational causes makes it a potentially useful instrument for many other theoretical frameworks. The routine activity perspective (Cohen and Felson, 1979; Felson and Boba, 2010), the routine activity theory of individual deviancy (Osgood et al., 1996), situational crime prevention (Clarke, 1983; 1997) and crime pattern theory (Brantingham and Brantingham, 1981; 1993) all emphasize situational rather than personal causes of crime, and implicitly suggest that they should be measured and analyzed. The space-time budget method is also potentially useful for social disorganization theory (Sampson, 2012), as it allows researchers to replace proxy measures of exposure (e.g., neighborhood of residence) with detailed actual measures of exposure to various environments, including neighborhoods.

Weaknesses of the method

Of course, the method has its weaknesses as well. A first weakness of the method is that the data collection is sizeable and costly. The interviews are lengthy, even more if one wants to enrich the space-time budget (STB) data with background information of the respondents. Also, every completed STB form has to be cleaned and corrected extensively to avoid coding mistakes. Because the coding responsibility is on the interviewers, the method requires comprehensive training on dealing with the code lists for activities, locations and present people, but also on dealing with the spatial equipment needed to geo-code the locations of the respondents.

Second, studying lifestyle theories or other theories that concern information over a longer period of time with STB data, requires the assumption that the four days are representative for that longer period. There is potential seasonal influence (the influence of the time of year in which data is collected), but time use researchers disagree to which extent this influence occurs (Harvey, 1999; Hill, 1985). Also, holidays and Sundays were excluded in the implementation of the STB method presented here, but this limitation could easily be reduced by using another design for the sampling of days from the past week.

Third, a problem with the application of time use instruments in criminological research is that crime, victimization and the like are rare events: Not every person is involved in crime and for those who are, it is not a daily activity. This implies two issues that researchers need to take into account. The first issue is that the method may not be appropriate to study inter-personal variation in offending: “Zero time in a particular activity in a short diary means either that the respondent is always a non-participant (...), or is just a non-participant during the sampled period” (Gershuny, 2012: 251). The second issue is that the sample needs to be large, because the data will otherwise not capture any criminal events at all (Harvey, 1999). A solution for this can be to draw a sample among a group of known offenders.

Fourth, the method is prone to underreporting second or third activities (if activities occur simultaneously) and of activities that have a short duration. To avoid the underreporting of main topics such as substance use, victimization and offending, the STB method separately asks for these and other incidents. Unfortunately, because it is very time consuming, this approach can only be applied to some main items of interest.

Fifth, the chosen time unit of one hour is not specific enough to establish the duration of activities that have a shorter time slot. The STB method is therefore not appropriate for studying, for example, the duration of crimes or of transportation between school and home; it is only relevant for establishing the frequency and contexts of such activities.

Sixth, a disadvantage of the geographical information collected with the STB method is that researchers have to make decisions on the shape and size of the spatial units (200 by 200 meter in the SPAN study) prior to the data collection, which leads to the ‘modifiable areal unit problem’ (Openshaw, 1984). This problem entails that the choice of the units is based on arbitrary reasons, but nevertheless may affect the results of later spatial analyses. The

magnitudes of spatial correlations may increase if data are aggregated to larger areas. An additional disadvantage of the geographical STB information is that data collection on large research areas such as countries is not feasible with the method in its current form.

Finally, the STB method has thus far only been applied to adolescents and young adults. Application of the method to adult respondents requires adjustment of the code lists. For example, the codes for job activities should be extended, as well as the codes for people present so that they include spouses and offspring, and probably also different categories of 'peers'. Furthermore, daily activities of adults may cover a larger geographical area than daily activities of adolescents, for example due to the distance between home and work: in 2011, 34 percent of the residents of The Hague worked outside of the municipality (Worp and Beekman, 2013). This complicates the collection of geographical information.

Validation

The space-time budget (STB) method as developed by Wikström et al. (2012a) has been validated, but the extent of validation is limited. Wikström and Butterworth (2006: 210-211) compared the frequency of offending and victimization during the seven days covered in the STB interview of the PYS study with the frequency of those events in the previous year as reported in the questionnaires. They report significant zero-order correlations of .35 for offending and of .13 for victimization. Validation analyses of the PADS+ data showed an even stronger correlation (.57) between self-reported crime in the questionnaire and in the STB interviews. Additionally, Wikström et al. (2012a: 325-327) found that adolescents who reported crimes in the STB interviews were more likely to have a police record or reprimand, a warning or a conviction, compared to adolescents who did not report crime in the STB interviews (correlation coefficient is .20, $p < .01$). Wikström et al. (2010; 2012a) further note that the spatial distribution of the STB reported crimes is similar to the spatial distribution of police recorded crimes for young offenders in the research area and that the temporal distribution (occurrence at different moments of the day) of STB reported violence is similar to the temporal distribution of police recorded assaults.

Table 3.1. Comparing the SPAN space-time budget data and questionnaire data on daily activities, offending, and substance use ($N = 1456$ individuals, waves 1 and 2 combined)

Items	STB		Questionnaire		Correlations
	Mean	(SD)	Mean	(SD)	
Daily Activities					
How often do you eat evening meals with your parents? ^a	3.17	(1.95)	2.46	(.84)	.190**
How many times a week do you help your parents around the house (housekeeping, cooking, doing the dishes, buying groceries etc.) ^a	1.23	(1.89)	1.58	(1.01)	.198**
About how much time do you spend on homework each day? ^b	2.27	(3.09)	1.39	(.78)	.465**
How often do friends visit you at home? ^a	2.61	(7.39)	.99	(.81)	.278**
How often do you visit your friends at their house? ^a	3.61	(6.93)	1.09	(.74)	.314**
How often do you hang out with your friends in the street, on squares or parks? ^a	2.51	(3.94)	1.13	(1.04)	.399**
How often do you hang out with your friends in a youth center or a sports club? ^a	1.73	(2.92)	.70	(.83)	.388**
How often do you hang out with your friends in shopping malls or the city shopping center? ^a	.60	(1.49)	.87	(.84)	.226**
Offending^a					
How often in the past year have you damaged or destroyed something not belonging to you? ^c	.03	(.23)	.55	(.87)	.161**
How often in the past year have you stolen something (from a shop, a bike or scooter) ^c	.01	(.07)	.28	(.60)	.100**
How often in the past year have you beaten up somebody? ^c	.04	(.22)	.61	(1.15)	.193**
How often in the past year have you carried a knife or other weapon? ^c	.48	(4.30)	.51	(1.26)	.294**
Substance Use^a					
How often do you drink alcohol? ^d	1.33	(3.22)	1.08	(1.16)	.685**
How often do you smoke hash or weed? ^d	.31	(1.76)	.34	(.80)	.603**
How often do you use other drugs, for example XTC, cocaine, speed or something else? ^d	.23	(1.42)	.06	(.33)	.332**

NOTES: The Table shows the results from Spearman's correlations between STB interview items and questionnaire items on the SPAN sample in both waves (wave one and two combined $N = 1456$). The values of the STB items express hours per respondent over the four STB days (96 hours), whereas the values of the questionnaire items express respondents' estimates of how often they are usually involved in daily activities, how often they use substances and how often they committed an offense in the past school year. Answer categories differ per questionnaire item (see notes below). The SPAN data collection took place in The Hague (the Netherlands) and incorporated two waves of data collection. The first wave was in 2008-2009, the second in 2010-2011. Respondents were 11 to 17 years old and were approached through the secondary school they attended. The mean age of the sample was 14.1 in the first wave and 16.0 in the second; the combined sample consisted of approximately 53.9 percent boys and 46.1 percent girls. Adolescents with an ethnic minority background (45 percent) and adolescents who followed lower forms of secondary education were somewhat overrepresented in the sample compared to the Dutch adolescent population. Also, the respondents all had a highly urbanized background, because The Hague is the third largest city in the Netherlands.

ABBREVIATIONS: STB = space-time budget data; SD = standard deviation.

^a (Almost) every day (6-7 days a week); several times a week (3-5 days); few times a week (1-2 days); (almost) never.

^b Never; less than one hour a day; about 1-2 hours a day; more than 2 hours a day.

^c Zero times; 1 time; 2 times; 3-5 times; 6-10 times; more than 10 times.

^d Never; less than once a month; once or a couple of times per month; once or a couple of times per week; (almost) every day.

^e Analyses conducted on multiple imputed questionnaire items (imputation with expectation maximization method).

** $p < .01$ (two-tailed).

Using SPAN data to compare information from the questionnaire with that of the STB, Bernasco et al. (2013b) report correlations of .64 in the first wave of the data collection and .73 in the second wave of the data collection for alcohol use measures and correlations of .57 and .63 for cannabis use measures. Hoeben and Weerman (2014, Chapter 5) compared in a similar fashion the questionnaire and STB information on ‘time spent with peers on the streets and in parks’ (correlations were .44 and .43 for the two respective waves of data collection) and ‘time spent with peers at youth centers and societies’ (correlations were .38 and .44 for the two waves of data collection).

For this contribution, we extended previous validation analyses by comparing the results of the SPAN space-time budget (STB) interviews with results from the SPAN questionnaires on several other activities: Daily activities, substance use and offending. Together with the STB interview, respondents completed a questionnaire that incorporated self-report questions about substance use (5 items) and offending (20 items). It also included, among other things, many stylized questions about the daily activities of the respondents, for example: ‘How often do you eat evening meals with your parents? *(Almost) every day (6-7 days a week); several times a week (3-5 days); few times a week (1-2 days); (almost) never.*’ The validation analyses were conducted on a combined dataset of the 843 respondents from the first wave of the SPAN study and the 613 respondents from the second wave who completed both the questionnaire and the STB interview (for more information on the SPAN data collection and sample, see Chapter 1). Abnormal STB days, on which respondents were ill or had a day off school due to special circumstances, were excluded from the analyses (2.4 percent of the hours from the first wave and 3.6 percent of the hours from the second wave were excluded).

Results in Table 3.1 show that all Spearman's correlations were significant and ranged from .100 to .685, providing at least tentative support for the claim that the STB method measures the involvement in activities that it was intended to measure. The correlations for offending were relatively weaker than the correlations for daily activities, whereas the correlations for substance use were stronger. Interpretation of these findings is impaired by uncertainty about which instrument actually has the highest accuracy. It may even be the case that high correlations are the result of systematic errors in both instruments. However, based on earlier studies that argue the superiority of time diaries over survey estimates (e.g., Robinson, 1999; Schulz and Grunow, 2012), we expect that involvement in daily activities and substance use is more accurately estimated by the STB method than in the questionnaire. The low correlations between the STB and questionnaire measures of offending are not surprising when taking into account how infrequent offending occurs. Because the STB incorporates four days, only very persistent offenders have a substantive probability to have their offending recorded in the STB. The instrument cannot distinguish between non-offenders and low or medium frequent offenders (Wikström et al., 2012a: 324). The questionnaire may therefore be a better instrument to measure variations in offending over extended time periods. Gershuny (2012) suggests using a combination of both instruments to capture long-term as well as short-term estimation of individual time use. Nonetheless, one should keep in mind that the STB method is not primarily aimed at measuring the prevalence of offending. Its strength is rather to measure the conditions under which offenses occur.

When (not) to use the space-time budget method

In summary, the space-time budget (STB) method can be very useful for criminologists who seek to operationalize 'lifestyles' or similar theoretical constructs in a more detailed way; for scholars who want to study activity sequences, temporal correlations or (micro) contextual influences on offending, victimization or other risky situations, and for scholars who are interested in 'exposure' from locations where respondents spend their time (over and above the influence of their community or neighborhood of residence). STB data can be aggregated in different ways and therefore enable

analyses with time slots, spatial locations and individuals as main units of analysis.

It is not recommended to use the STB method when limited (financial) resources are available, when one is mainly interested in the prevalence of offending among a group of 'average' respondents, when the study concerns a spatial area larger than a city, when the population of interest consists of adults or children or when the study concerns the duration of activities that cover less than an hour (e.g., travel, offending). Adjusting the time unit of an hour to smaller time units is possible, but might require a different interviewing format: A smaller time unit may hamper retrospective questioning over four days due to memory problems.

Anticipated future developments

Future research projects will probably further refine and improve the space-time budget (STB) method to enable its application to research areas larger than a city and to enable its application to adults and children. Developments in that direction already take place: The PADS+ study currently consists of seven waves and the respondents are now between 22 and 23 years old. The method has constantly been adjusted to the respondents' new life stages.

We anticipate that the increasing role of information and communication technologies in daily activities will have substantial consequences for individuals' spatial and temporal behavior and therefore on their delinquent behavior. Hågerstrand (1970: 15) already noted that 'telecommunication' allows people to connect 'without (or nearly without) loss of time in transportation.' Yu and Shaw (2007) reinterpreted his thoughts taking into account the technological developments of the last decades (see also Janelle, 2012, and Figure 9 in Harvey, 2003). These developments will demand instruments that are able to map virtual behavior, or that are at least able to take these changes into account.

On the other hand, we expect that the same developments regarding information and communication technologies, will increasingly broaden the methodological possibilities for space-time use research. A prominent example is the application of smartphones. Although the application of smartphones for social science research is in its infancy (e.g., Miller, 2012;

Raento, Oulasvirta, and Eagle, 2009), it has great potential for time use research. A mobile app that questions respondents about their activities may reduce the costs of the data collection substantially, by decreasing the duration of the interview and by making home visits superfluous. It may also reduce the burden on the respondents and thereby increase response rates, because respondents carry smartphones with them constantly already and they could fill out questions on 'lost' moments during the day. Moreover, smartphones can record geographical information, which could easily be combined with a specific app asking for information on activities, functional locations and present others. First attempts have already been made to apply smartphones in time diary research (Sonck and Fernee, 2013), and the step to a criminological application is relatively small. For example, Browning et al. (2014) just started the data collection of a project on adolescent development and behavioral outcomes in which respondents carry smartphones that collect information on their geographical location. This information is used to guide subsequent space-time use interviews. Evidently, the use of smartphones for this kind of research raises new issues regarding privacy and regarding differences between experienced and inexperienced users of these devices. It would also require further development of analytical techniques and computational capacity to handle big data. Nevertheless, we expect that the use of smartphones will offer a substantial methodological improvement on current time use research.

Further reading

Pentland, Wendy E., Andrew S. Harvey, M. Powell Lawton, and Mary Ann McColl. 1999. Time Use Research in the Social Sciences. New York: Kluwer Academic Publishers.

Reference book on time use research that gives an elaborated historical overview of time use studies in the last century, discusses new analytical strategies and addresses a variety of different applications of time use research. Additionally, this book discusses the specifics and pitfalls of implementing a time use data collection.

The Centre for Time Use Research offers an extensive overview of publications on time use at www.timeuse.org.

Anderson, J. 1971. Space-time budgets and activity studies in urban geography and planning. Environment and Planning 3(4): 353-168.

Bhat, Chandra, and Frank S. Koppelman. 1999. A retrospective and prospective survey of time-use research. Transportation, 26(2): 119-139.

These two publications provide an overview of the theoretical and empirical developments in space-time use research around the time of their publication. The study of Anderson (1971) gives an overview of the early works into space-time use research. Bhat and Koppelman (1999: 118) describe, nearly three decades later, the developments that carried the field 'past the tip of the iceberg'.

Hägerstrand, Torsten. 1970. What about people in regional science? Papers of the Regional Science Association, 24: 7-21.

Classic work in which Hägerstrand's time-geography approach is presented. He introduces individual space-time prisms and describes the types of constraints that have to be taken into account in studying these prisms. This work has provided a theoretical foundation as well as a basis for later analytical approaches into studying individual space-time activity patterns.

Belli, Robert F., Frank P. Stafford, and Duane F. Alwin. 2009. Calendar and Time Diary: Methods in Life Course Research. Los Angeles: SAGE Publications.

Reference book on the time diary method: It points to the problems that are associated with the implementation of the method (shortcomings of the method as well as problems with the burden on respondents and corresponding response rates) and addresses several applications of time diary data in research.

Wikström, Per-Olof H., and David A. Butterworth. 2006. Adolescent Crime: Individual Differences and Lifestyles. Collumpton: Willan Publishing.

Wikström, Per-Olof H., Dietrich Oberwittler, Kyle Treiber, and Beth Hardie. 2012a. Breaking Rules: The Social and Situational Dynamics of Young People's Urban Crime. Oxford: Oxford University Press.

Wikström, Per-Olof H., Kyle Treiber, and Beth Hardie. 2012c. *Examining the role of the environment in crime causation: Small-area community surveys and space-time budgets*. In *The SAGE Handbook of Criminological Research Methods*, eds. David Gadd, Susanne Karstedt, and Steven F. Messner, Los Angeles: SAGE Publications.

Reference works on the space-time budget method that was developed by Wikström and colleagues for application in criminological research. Wikström and Butterworth (2006) describe the findings of the pilot study, the Peterborough Youth Study. 'Breaking Rules' (Wikström et al., 2012a) concerns the follow-up study (PADS+). The latter gives an historical background of the space-time budget method and an overview of what the method entails. It further describes interviewer trainings, materials used for geo-coding, and the background of the decisions made on time units, spatial units, the choice for incorporating four days of measurement and the choice for one-to-one interviews. Additionally, these books describe the first empirical results obtained with the STB data. The SAGE handbook chapter (Wikström, Treiber, and Hardie, 2012c) gives a concise and accessible overview of the technicalities of the STB method and describes the steps scholars should take when developing a space-time budget method.

Empirical studies that applied Wikströms' space-time budget methodology for criminological research are also recommended for further reading (Averdijk and Bernasco, 2014; Bernasco et al., 2013a; Bernasco et al., 2013b; Ceccato and Wikström, 2012; Hoeben and Weerman, 2014; Janssen, Deković, and Bruinsma, 2014; Weerman et al., 2013; Wikström, 2009; Wikström, 2014; Wikström and Butterworth, 2006; Wikström et al., 2010; Wikström et al., 2012a).



Chapter Four.

Systematic Social Observation

Hoeben, Evelien M., Wouter Steenbeek, and Lieven J.R. Pauwels. 2016. Measuring disorder: Observer bias in systematic social observations at streets and neighborhoods. *Conditionally accepted for publication in Journal of Quantitative Criminology.*



Systematic Social Observation

*Among the limitless attributes of a person's surroundings,
which ones are relevant to his behavior, and how does one identify
and measure them? – Roger Barker*

Physical and social disorder has been related to mental and physical health problems (see overview given by Schaefer-McDaniel et al., 2010), community disruption (Steenbeek and Hipp, 2011), fear of crime (Kelling and Coles, 1996; Perkins and Taylor, 1996), and crime itself (Skogan, 1990). The broken window theory, which focuses on the associations between disorder and crime, has been influential in criminology and sociology and has also inspired a variety of policy programs (Braga, Welsh, and Schnell, 2015). However, despite the societal and academic attention focused on disorder, a number of issues still hamper empirical studies of this phenomenon.

The current study takes up the call from Sampson and Raudenbush (1999: 32) for the development of a “science of ecological assessment”. One of the main tasks of the science of ecological assessment is dealing with the units of analysis by which phenomena and associations are measured and studied. This problem is inherent to ecological research because it lacks a natural unit such as a person. The current study adapts knowledge from psychometrics (e.g., concerning internal consistency or inter-rater reliability) to improve ecometric measures of disorder at the level of street segments and neighborhoods. Although many studies have implemented ecometrics, few have paid attention to observer bias in ecological constructs. The current study attempts to fill this gap by examining observer bias in systematic social observation of physical and social disorder.

Systematic social observation (SSO) of disorder refers to systematically tallying all signs of disorder, such as cigarette butts, empty bottles and litter in one location, for example in a street segment or face block. The most important advantage of SSO over other methods for measuring

disorder (census data, community surveys and key informant interviews) is that it relies on the independent observation of locations by researchers, and not on conversations with respondents. It therefore does not have to deal with non-response, socially desirable answers or memory bias due to retrospective questioning. However, this is only the case if disorder observations obtained with SSO are not biased by the observers or other varying conditions; a disadvantage of the SSO method is that it is a snapshot in time. Some conditions under which observations are conducted may vary and bias the observation, such as the time of day, the day of the week, and the season in which the observation occurs (Jones, Pebley, and Sastry, 2011; Raudenbush and Sampson, 1999). Observers may bias the measures, because of their varying perceptions of disorder, or because of fatigue or burnout cynicism (Mastrofski, Parks, and McCluskey, 2010; Spano, 2005). A major shortcoming in most previous SSO studies is the lack of attention to sources of observer bias. If characteristics of observers (such as their perceived vulnerability or urban background) affect their perceptions about disorder, not accounting for such characteristics would bias the obtained measures of disorder. Therefore we built on previous research and present a refined model to directly control for observer characteristics in ecological constructs. Data for the current study were collected in a conurbation in Europe: The areas surrounding The Hague, the Netherlands.

Theory

Disorder and crime

Broken windows theory describes a process of urban decay in which signals of social disorder evoke fear of crime and fear of personal victimization. This causes a breakdown of community control as inhabitants turn away from what happens on the street (Wilson and Kelling, 1982). The breakdown of community control provokes other forms of disorder as well as forms of crime, because such behavior is less likely to receive a response. Signs of disorder communicate to potential offenders that “no one cares”. In the end, these processes of decreased control and increased disorder and crime result in a lack of confidence in police intervention and a more severe breakdown

of community control (Skogan, 1990; Wilson and Kelling, 1982).

The empirical literature is still inconclusive about the direction of the relationship between disorder and crime. Although some studies suggest that disorder causes crime (e.g., Skogan, 1990), and that reducing disorder helps to reduce crime rates (e.g., Braga et al., 1999), others have argued that the relationship is reciprocal (Bogges and Maskaly, 2014); that disorder and crime are two ends of the same continuum caused by a third factor (Sampson and Raudenbush, 1999), or that they are actually the same thing altogether (Gau and Pratt, 2008). Even though the specifics of the disorder-crime relationship are still a subject to debate, the existence of a correlation between disorder and crime is well established (Skogan, 2015), which emphasizes the importance of accurately measuring disorder.

Measuring disorder through systematic social observation

In the 1980s and 1990s, Taylor, Perkins and colleagues proposed systematic social observation as a way to systematically observe physical and social disorder ('incivilities') at street block level (Perkins, Meeks, and Taylor, 1992; Perkins and Taylor, 1996; Taylor, Gottfredson, and Brower, 1984). Systematic social observation (SSO) refers to observation that is done systematically, in this case by filling in a checklist of disorder items. For example, 'Is litter present, yes or no?' Specific procedures dictate the unit of observation (e.g., streets, face blocks), the topic of observation (e.g., cigarette butts, dog feces), the duration of the observation (e.g., number of minutes) and the method of recording (e.g., on paper or by videotape; Reiss, 1971). A typical SSO disorder study is organized as follows: In each neighborhood, a few locations are indicated as points of observation. The observers tally signs of disorder at these points of observation, for example, counting the number of empty bottles or abandoned bicycles. Points of observation can be houses, face blocks or street segments. All points that have to be observed are allocated to a group of observers. To keep costs low, the number of observers is usually small, varying from a handful (e.g., Perkins and Taylor, 1996) to a dozen (e.g., Clifton, Smith, and Rodriguez, 2007). This means that each observer visits tens to hundreds of locations, depending on the size of the research area. The small number of observers also means that observers visit multiple neighborhoods.

SSO differs from other methods for measuring disorder in several regards, and may be preferable to these methods in addressing specific topics. Census data are often not available for smaller areas. Key informant interviews⁹ rely strongly on finding the appropriate respondents and, similarly to community surveys, run the risk of bias due to differing perceptions on the boundaries of the unit that is questioned (Coulton et al., 2001; see also the work on ‘egohoods’ of Hipp and Boessen, 2013) or differing perceptions on types of disorder (e.g., what is graffiti? Do pieces count as well as tags? What defines ‘a lot of’ cigarette butts?). SSO relies on the observation of locations instead of on the interviewing of respondents. Therefore, by using SSO, we eliminate any issues with non-response, sampling decisions (e.g., whether researchers should interview adults versus adolescents, or new inhabitants versus individuals who lived in the area for a number of years), and the risk of socially desirable answers. Furthermore, SSO enables the precise recording of events prior to, during, and after the phenomena of interest and other conditions under which these phenomena are observed (Mastrofski, Parks, and McCluskey, 2010; Reiss, 1971). Measuring phenomena through interviewing residents or key informants is by definition retrospective and therefore filtered by “judgment and memory” (Carter, Dougherty, and Grigorian, 1995: 221). Thus, SSO may be a useful method if one wants to collect information about disorder at smaller levels of analysis (such as street segments), or that is unbiased by mental maps of the neighborhood, differing perceptions about disorder, retrospective questioning, or social desirability.

A disadvantage of the SSO method is that it gives information at one point in time, whereas an interview with a neighborhood resident may give an idea of the level of disorder over time. Replicability of SSO measurement is assumed because of its explicit procedures, disregarding the fact that some conditions under which observations are conducted may vary over time and thus bias the observation. This makes SSO more vulnerable to bias compared with methods that cover a longer period. Examples of biasing conditions are the time of the day, day of the week and the season in which the observation

9 The key informant interview is a method for data collection that collects information by interviewing one or more persons that have a central role in the community, and who are therefore able to provide specific information on the neighborhood as a whole or aspects of the neighborhood that are of specific interest. Key informants are not approached because they represent residents, but because of their professionally acquired knowledge on the topic of interest (Pauwels and Hardyns, 2009; Tremblay, 1957).

takes place (Jones, Pebley, and Sastry, 2011; Raudenbush and Sampson, 1999). Observers may also bias the observations. This will be elaborated on in the following section.

Sources of observer bias in systematic social observation of disorder

‘Systematic’ observations would be a lot less systematic if observers varied in their recordings of the topic of interest. Observer bias has even been referred to as the most serious challenge of field research (Spano, 2005). Nevertheless, there has not been much attention paid to this problem in studies on SSO. This section summarizes three sources of observer bias: Sources of *intra*-observer bias (socialization and fatigue), sources of *inter*-observer bias (based on individual characteristics and prior experiences), and reactivity¹⁰.

First, sources of *intra*-observer bias—if observers change their observation over time—include observer socialization and fatigue. *Observer socialization*, also referred to as ‘going native’, occurs if observers change their attitude toward the topic of interest during the project (Spano, 2005). Over the course of a project, observers can become more sympathetic toward the topic under investigation. This may translate into increasing involvement with their research subjects, or even participation in activities under study (Adler and Adler, 1987). *Fatigue*, or ‘burnout cynicism’, occurs if observers become bored or tired, and therefore less accurate in their recordings. Fieldwork can be mentally and physically demanding, because observers have to maintain focus, “be polite at all costs”, “play the fool” in interaction with research subjects (Spano, 2005: 586), and, in the case of the current study, spend long periods of time walking outside on the streets and traveling from one research location to the other. Exhaustion may undermine observers’ accuracy or memory, but may also trigger ‘shirking’, which occurs when observers unintentionally or intentionally reduce their workload by avoiding the recording of events that require additional coding (Mastrofski, Parks, and McCluskey, 2010). Observer socialization and fatigue are both expected to result in less accurate and comprehensive data at later stages of the data

¹⁰ We concentrate on unintentional observer bias and do not take into account intentional bias caused by cheating.

collection. Therefore, we hypothesize that observers will report fewer signs of disorder as the number of observations increases over the course of the *project*, and over the course of the *day* (Hypothesis 1).

Second, sources of *inter-observer* bias—differences in observations between observers—can be found in observers' personal characteristics and prior experiences. Individual characteristics and prior experiences shape the feelings, images and memories that observers bring to the field. These unconscious perspectives and thoughts may shape observers' judgments and understanding, and thereby bias observations (Hunt, 1989). Empirical research on this form of observer bias in SSO is fairly limited. Mastroski, Snipes, and Supina (1996) investigated whether observers' personal views on community policing implementation biased their observation of police officers' community policing orientation and the officers' success in achieving compliance from citizens, but did not find evidence for such bias. On the other hand, Reiss (1971) found that observers' professional expertise (i.e., police training, social scientists and a background in law) affected their observation of police behavior. Additionally, in an experimental study, Yang and Pao (2015) investigated whether police officers perceived disorder (in photos) differently than students. This indeed appeared to be the case, more so for social disorder than physical disorder. Studies on individual perceptions of neighborhood disorder generally derive information from community surveys, to examine whether some respondents are more likely to report disorder in their own neighborhood than others. Findings of these studies indicate that several demographics are indeed predictive of reports of disorder: Females report more disorder than males (Hipp, 2010; Sampson and Raudenbush, 2004; Wallace, Louton, and Fornango, 2015; null-findings by Franzini et al., 2008; Latkin et al., 2009; reversed effect reported by Hinkle and Yang, 2014), younger individuals report more disorder than older individuals (Hinkle and Yang, 2014; Hipp, 2010; Latkin et al., 2009; Sampson and Raudenbush, 2004; Wallace, Louton, and Fornango, 2015; null-finding by Franzini et al., 2008), and individuals from ethnic minority backgrounds report less disorder (Franzini et al., 2008; Hipp, 2010; Sampson and Raudenbush, 2004; Wallace, Louton, and Fornango, 2015; null-finding by Hinkle and Yang, 2014). The studies also point at other characteristics that may be relevant in determining individuals' perceptions of disorder, such as having a history of depression (Latkin et al., 2009) and marital status

(Franzini et al., 2008; Latkin et al., 2009; Sampson and Raudenbush, 2004; Wallace, Louton, and Fornango, 2015). It is unclear to what extent these findings are generalizable to the situation of SSO, as residents may perceive disorder very differently compared with observers who are conducting systematic observations (Hinkle and Yang, 2014).

Building on the theoretical and empirical context outlined by these studies, we theorize that two features of observers may be relevant in explaining their perceptions of physical and social disorder: Their urban background, and their perceived vulnerability for victimization. Individuals may be cognitively adjusted to disorder in their own neighborhood and their experiences with disorder in prior neighborhoods (Taylor and Shumaker, 1990). This may affect their assessment of disorder in other neighborhoods (Hipp, 2010; Sampson and Raudenbush, 2004) and potentially make them more aware of their surroundings in areas where the level of disorder is very different from what they perceive as normal. Experimental research suggests that individuals' urban background (the urbanicity of their own neighborhood) is indeed a relevant factor in making accurate inferences about communities based on signs of physical disorder (O'Brien et al., 2014). As the data collection for the current study took place in a highly urbanized area, we hypothesize that observers from similarly urbanized neighborhoods will report less disorder than observers from rural backgrounds (Hypothesis 2).

Observers' perceived vulnerability to victimization may also affect their observations of disorder. The literature on fear of crime suggests that some individuals are more aware of their surroundings than others because of personal safety reasons (Hale, 1996; LaGrange and Ferraro, 1989). Individuals who perceive themselves to be more vulnerable will be more aware of their surroundings and potentially also of signs of physical and social disorder (Hipp, 2010), as disorder gives a signal of potential threats in that area (Innes, 2004). This idea is supported by empirical findings that females perceive more disorder than males (Hipp, 2010; Sampson and Raudenbush, 2004) and that residents who reported to 'feel unsafe' perceived more social disorder in their street segments than others (Hinkle and Yang, 2014). In the current study, we test the hypothesis that females, as well as observers who perceive themselves to be more vulnerable toward victimization are likely to report more disorder (Hypothesis 3).

A third source of bias is not linked to characteristics or experiences of observers (such as the previously discussed sources of intra-observer and inter-observer bias), but to the reaction of the *observed* to the presence of the observer. This source of bias is referred to as ‘reactivity’, or the ‘Hawthorne effect’ (Spano, 2003, 2005; Sykes, 1978). Reactivity occurs if subjects change their behavior in reaction to the presence of the observer. We do not expect this to bias the observation of physical disorder, as physical disorder only refers to objects, and not people. As for the observation of social disorder, we deem it possible, yet improbable, that beggars, prostitutes, or people under the influence of alcohol will leave the area if they see an observer taking notes. Furthermore, because the systematic social observation of disorder usually takes place within a few minutes and does not require interaction with subjects, we expect that reactivity is not a major source of observer bias for the observation of disorder.

Observer bias in ecological constructs

Disorder measures derived from systematic social observations, as well as from other sources such as community surveys, are generally used to construct aggregated measures. For example, at the level of street segments, neighborhoods, census tracts, or city districts. In assessing observer bias for these units of analysis, we are challenged with an additional issue: The allocation of observers to different areas. We previously noted that SSO disorder studies are often organized by letting a handful of observers observe tens to hundreds of locations. These observers conduct observations across several neighborhoods or census tracts. Figure 4.1 illustrates such an allocation of observers to different neighborhoods. In Figure 4.1, neighborhood 1 consists of three street segments, two of which are observed by observer 1 and one that is observed by observer 2. Neighborhood 2 consists of two street segments that are both observed by observer 2. Assessment of observer bias in aggregated constructs of SSO disorder measures requires taking into account this cross-classified data structure (Fielding and Goldstein, 2006).

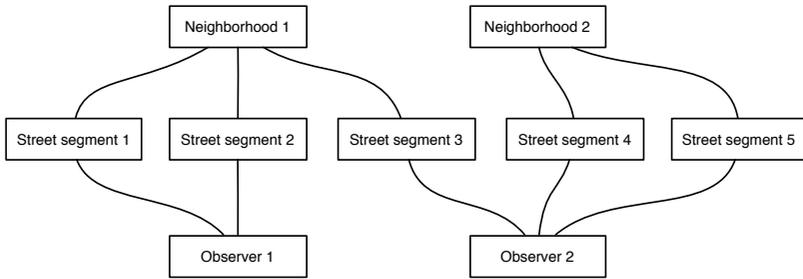


Figure 4.1. Street segments nested within neighborhoods and observers

Current study

The current study contributes to existing research in three ways. First, the study presents an innovative ecological model to directly control for observer bias in observations of physical and social disorder. The model builds on the ‘model for uncertainty in SSO’ (also called *ecometrics*) of Raudenbush and Sampson (1999), and refines it by taking into account the allocation of street segments to observers across neighborhoods. The model as proposed by Raudenbush and Sampson (1999) allows the studying of item inconsistency within a street segment, and street segment variation within neighborhoods. These goals were achieved by measuring a three-level hierarchical model with items at level 1, face blocks (in our case street segments) at level 2, and neighborhoods at level 3, with the control variable ‘time’ at the level of face blocks. Our refinement of the model of Raudenbush and Sampson (1999) is the addition of the ‘observers’ level, crossed with neighborhoods at level 3. This new crossed three-level model enables us to gauge the extent of observer bias (street segment variation within observers) and to explain this bias using several observer characteristics. Figure 4.1 is a schematic representation of the cross-classified data structure.

A second contribution to existing research is that the study thoroughly examines the extent to which systematic social observations of disorder are biased by observer characteristics (urban background, gender, perceived vulnerability to victimization), observational conditions (time, day, and weather), fatigue or socialization effects over time (number of observations

during the entire project and on a specific day), and by observers' feelings of safety at the observed locations.

Third, the study uses data collected in a European city, which extends the scope of earlier SSO studies on ecological disorder assessment that were mostly conducted in the United States¹¹. To our knowledge, there have been no studies that have applied SSO to the measurement of crime and disorder in a European city.

In summary, the current study investigates whether systematic social observation enables reliable and valid measurement of physical and social disorder at both the street segment level and the neighborhood level. With 'reliability', we refer to internal consistency of the measure and to ecological reliability, which is the extent to which the observed characteristics can be interpreted as characteristics of neighborhoods, as opposed to characteristics of the smaller units on which they are observed (in this case 'street segments'). 'Validity' refers to whether a measure captures the idea contained in the intended concept. In the current study, validity specifically refers to the absence of systematic bias by observer characteristics or observational conditions and is also studied as nomological validity, with crime as a variable for validation¹². To determine reliability and validity, we present a cross-classified model that takes into account observer bias.

11 A few exceptions are studies in Canada (Craig et al., 2002), Australia (Jago et al., 2005), the United Kingdom (Weich et al., 2001) and one study in the Netherlands (De Vries et al., 2007). See Schaefer-McDaniel et al. (2010) for an extensive overview of previous SSO studies. Of the studies that were not conducted in the United States, a majority concern health issues related to neighborhood characteristics.

12 Numerous different types of validation have been suggested. We maintain the distinction of Adcock and Collier (2001: 539, 542), who distinguish 1) content validation, which is understood as "focusing on the relationship between an indicator and the concept of interest", and is concerned with whether all relevant elements are covered; 2) convergent/discriminant validation, which exists if indicators of a similar concept are empirically associated with each other (they are convergent) and more weakly associated to indicators of a second, different concept (they discriminate among concepts) 3) nomological/construct validation can be used "in a domain of research in which a given causal hypothesis is reasonably well established". Evidence for validity is found if the given hypothesis is again confirmed with the 'new', to be validated, indicator of one of the variables in the hypothesis. In the current study, we test nomological/construct validation by studying the relationship between disorder and crime.

Data and methods

Data were collected as part of a larger NSCR research project: The Study of Peers, Activities and Neighborhoods (SPAN). The SPAN project used observation units (grid cells) of 200 by 200 meters (656 by 656 feet), which were determined independently of the neighborhood boundaries as defined by the local government. The research area concerns the municipality of The Hague, the third largest city in the Netherlands, but also includes parts of the surrounding municipalities of Westland, Leidschendam-Voorburg, Delft, Wassenaar, Pijnacker-Nootdorp and Rijswijk. The entire research area incorporated 4561 grid cells. The centroids of every third grid cell were observed, resulting in a total of 1422 centroids, spanning 253 neighborhoods (neighborhood boundaries as defined by Statistics Netherlands). At every given address (based on the centroid of a grid cell), observers made photographs with a camera equipped with a GPS device. For 268 points of observation, observers were asked to observe a location based on the coordinates of the nearest street point, as there was no address within 200 meters of the centroid. The exact location of all observations was determined afterwards, based on the recorded GPS coordinates. Observers were instructed to walk 50 meters to the left and 50 meters to the right from the given address (or coordinates) and thereby observed street segments of 100 meters (both sides of the street). Each observation was carried out by one observer. In total, thirteen observers participated in the data collection, all of which were undergraduate or graduate students in the social sciences. The students were aged between twenty to twenty four years, and twelve of them were of native Dutch descent. Six of the thirteen observers were female.

The data collection took place between March and June 2012. Observations were restricted to workdays (Monday to Friday, except on holidays or during primary and secondary school vacations) between 10.00a.m. and 4.00p.m. Observations were not executed on days when garbage was collected by the municipality. Observation of one street segment took on average eight minutes and nine seconds. The observation form included 61 items concerning land use, physical disorder, social disorder, physical condition of buildings, territoriality, traffic, formal and informal control, and guardianship. The instrument contained both dichotomous items (yes or no) and items with an ordinal scale (none, one, and more

than one). A first version of the instrument was tested in a pilot study in September and October 2011.

Prior to the data collection, all observers were trained to improve inter-rater reliability. The training took 1.5 days and also provided a short introduction to the theoretical background of the data collection. The observers had to practice with pictures taken during the pilot study and were confronted with common mistakes, also based on experiences from the pilot study. Then they were sent out to conduct field observations in groups of two or three observers. Their observations were analyzed by two researchers. Mistakes, problems and irregularities were discussed with the group, as suggested by Zenk et al. (2007). Observers that had scored items very differently were taken apart for additional instructions. Ten percent of the locations ($N = 147$) were coded double independently by two different observers to examine inter-rater reliability. Cohen's kappa was .731 for physical disorder and .957 for social disorder; percentages of agreement varied between 61.9 and 100.0 across the items. For more details about the data collection, see metadata at DANS (PID urn:nbn:nl:ui:13-wngr-5q).

Figure 4.1 gives a simplified representation of the cross-classified data structure. In the actual data, there were 253 neighborhoods, 1422 street segments, and thirteen observers. In each neighborhood, on average 5.62 street segments were observed. Each of the 13 observers observed on average 109 street segments. The median number of different observers in one neighborhood was three; 64 of the 253 neighborhoods were observed by three different observers. An observer observed on average 58 different neighborhoods (median is 37)¹³.

Measures

The dependent variables were the items of a physical disorder construct and a social disorder construct. The physical disorder construct consisted of 7 items, e.g., dog feces, abandoned bicycles and graffiti. The social disorder

¹³ More specifically: In 32 neighborhoods we observed only one street segment (= minimum), whereas in one neighborhood we observed 51 street segments (= maximum). One observer observed 28 street segments (= minimum), the maximum amount of street segments observed by one observer is 226. Thirty-eight neighborhoods were observed by only one observer, whereas one neighborhood was observed by seven different observers. The minimum amount of neighborhoods that were observed by one observer is 21, and the maximum was 120.

construct consisted of 8 items, e.g., teenagers loitering and loud music playing. The items of physical disorder were initially measured on an ordinal scale (none; 1; more than 1), but were dichotomized because most items behaved as dichotomous items and because it was more consistent with the analyses for social disorder. All indicators of disorder were recoded to score 0 for 'not observed' and score 1 for 'observed'. For a complete overview and frequency distribution of items per scale, see Table 4.1.

Independent variables were *observer characteristics* and *observational conditions* that potentially biased the disorder observations. Five observer characteristics were investigated. *Urban background* referred to the population density of the area where the observers grew up ('where did you live most of the years between birth and your 18th birthday? Please note down the address'), based on census data of Statistics Netherlands. Urbanicity of the area was expressed in five categories: 1 was 'very strongly urban' (≥ 2500 addresses per km²), 2 was 'strongly urban' (1500-2500 addresses per km²), 3 was 'mixed rural and urban' (1000-1500 addresses per km²), 4 was 'moderately rural' (500-1000 addresses per km²), 5 was 'rural' (< 500 addresses per km²). *Gender* was a dichotomous variable that expressed whether the observer was male (1) or female (0). *Perceived chance of victimization* consisted of three items that each concerned a different type of victimization: Victimization of threat, abuse and burglary (e.g., 'how do you estimate your risk of becoming a victim of threat in the coming year?'). Each item originally had seven answer categories, varying from 'very big chance' (1) to 'very small chance' (7). As none of the observers scored 1, 2 or 3, the scale consisted of four categories, coded such that a higher score indicated a bigger perceived chance of victimization. *Perceived response to threat* consisted of one item: 'In the event of an assault on the street by a young, unarmed man, which of the following categories applies?' 1) I'm sure I'd be able to escape or to defend myself, 2) I'd probably be able to escape or to defend myself, 3) it depends, 4) I'd probably give in and do what he says, 5) I'm sure I'd give in and do what he says. This construct was derived from Killias and Clerici (2000) and translated to Dutch. The observers only scored in the categories 1, 2 and 3. The scale therefore consisted of three categories, coded such that a higher score indicated higher perceived vulnerability. *Feelings of safety at observation locations* expressed to what extent observers reported feeling safe in a street segment, varying from 'unsafe, not at all at ease' (1) to 'safe,

completely at ease' (5). This was asked for every observed street segment, and we included observers' mean scores across all the sites they observed. Descriptive statistics are given in Table 4B.1 in the Appendix of this chapter.

Six observational conditions were examined: *Time of day* referred to the hour in which the main part of the observation took place (between 10.00a.m. and 4.00p.m.); *day of week* referred to the weekday on which the observation took place; *weather condition* expressed the weather on the moment of observation, categorized with five different conditions: 'Sun, clear blue sky'; 'sun with an incidental white cloud'; 'mainly cloudy, with sun shining through'; 'drizzle rain, sun shines through the clouds'; 'sky is completely clouded, clouds are grey, no sun shining through'. Observers were instructed not to perform observations in the case of snow, pouring rain or hail, or a thunderstorm. To investigate fatigue and burnout cynicism of observers, we examined at the street segment level what number observation this was for the observer, being how many observations the observer had already conducted, both in total and that day. We also examined observers' *feeling of safety at that observation location*, as a deviation of the observers' overall reported feeling of safety across all of their observations. A positive deviation indicated that the observer felt safer at that location than average, and a negative deviation indicated that they felt less safe than usual. The last three 'observational conditions' are of course observational conditions as well as observer characteristics. As they were investigated at the street segment level, we discuss them as part of the observational conditions. Descriptive statistics are given in Table 4B.1 in the Appendix of this chapter.

Areal crime rates were used to investigate nomological validity of the disorder constructs. The crime rates were operationalized with police registered offenses in public places, committed between 2007 and 2009. These were the most recent available data; police data are not usually geo-coded. The registered offenses had been reported by victims and bystanders or were noted by the police. All data were geo-coded with the exact location of where the crime had occurred. For the current study, we aggregated that information to count the number of crimes per grid cell (grid cells were 200 by 200 meters, and this information was matched to the disorder observations conducted at the grid cell centroids) and per neighborhood, with boundaries as defined by Statistics Netherlands. The distinction in 'private', 'semi-public' and 'public' places was made by the police. 'Public places' are, for

example, a market, parking lot or train station. We specifically studied crime in public places based on the assumption that behavior in public spaces is more strongly related to the presence of disorder than behavior elsewhere. Additional analyses with ‘general’ crime showed substantially similar results as the ones presented in this chapter.

Analytical strategy

Three models were estimated for both physical and social disorder: 1) an empty three-level model with items at level 1, street segments at level 2 and both neighborhoods and observers at level 3 (cross-classified model); 2) the cross-classified model extended with one control variable at the observer level; 3) the cross-classified model extended with one control variable at the observer level and variables on observational conditions at the street segment level. To every model, item dummies were entered as independent variables, centered on their grand mean (following Raudenbush and Sampson, 1999). Centering occurred separately for physical and social disorder. The hierarchical models as proposed by Raudenbush and Sampson were also estimated (1999). We refer to those models as ‘traditional econometrics method’ throughout this chapter. Results of the traditional econometrics models are given in Table 4C.1 in the Appendix of this chapter, and in Table 4E.1 in the supplementary material.

Random intercept models were estimated with Markov Chain Monte Carlo (MCMC) procedures in MLwiN 2.20 (Browne, 2012), using IGLS estimates as starting values. Logit functions were used because of the dichotomous nature of the physical and social disorder items; variance at level 1 was fixed (Snijders and Bosker, 2012, section 17.3). The posterior means of the Bayesian estimation are considered to be the best unbiased measures of disorder (Snijders and Bosker, 2012, section 4.8). These estimates are thus our adjusted measures of disorder, used to study disorder-crime correlations. The measures at *street segment level* are the sum of the posterior mean at observer level, the posterior mean at the neighborhood level and the posterior mean at street segment level. The measures at the *neighborhood level* represent the posterior mean at the neighborhood level.

Findings

Table 4.1 shows the frequency distribution of the individual disorder items. The frequencies and percentages express in how many street segments these items were observed at least once. Signals of social disorder were far less frequently observed than signals of physical disorder. The frequency of the items is in line with findings of Raudenbush and Sampson (1999): More serious signals of disorder (e.g., abandoned bicycles, people using drugs) are reported less often than less serious signals of disorder (e.g., cigarette butts, adults loitering).

Table 4.1. Occurrence of physical disorder and social disorder ($N = 1422$ street segments)

Scales and items	Frequency	Percentage
Physical disorder		
Litter or broken glass	967.0	68.0
Cigarette butts	849.0	59.7
Dog feces	350.0	24.6
Empty bottles or cans	348.0	24.5
Graffiti tags (small surface, tag)	211.0	14.8
Abandoned bicycles	44.0	3.1
Graffiti pieces (big surface, piece)	36.0	2.5
Social disorder		
Adults loitering	110.0	7.7
Loud music	39.0	2.7
Teenagers loitering	30.0	2.1
People fighting or arguing	9.0	.6
Smell of marihuana	3.0	.2
People drinking alcohol	2.0	.1
People using drugs	2.0	.1
Beggars	1.0	.1

NOTES: Frequencies and percentages express in how many street segments these items were observed at least once.

Variance components: Street segments, neighborhoods and observers

One way to establish the presence of inter-observer bias is to investigate the variation in observed disorder between and within observers. But of course, disorder varies also between and within neighborhoods. As a first step in building our model, we therefore investigated the variance components of

the disorder items. In other words, we investigated to what extent the total variance in disorder was attributed to a) variance between observers, b) variance between neighborhoods and c) variance between street segments.

Table 4.2. shows the variance components per disorder construct of an empty three-level model with items at level 1, street segments at level 2 and neighborhoods crossed with observers at level 3. Approximately 6.3 percent of the total variance in physical disorder reflects differences between neighborhoods (6.340, Table 4.2.) and 12.4 percent (12.412) reflects differences between street segments. For social disorder, 17.2 percent (17.228) of the total variance reflects differences between neighborhoods and 24.2 percent (24.243) reflects differences between street segments. One can compare these findings with those derived from a traditional econometrics model, which does not take into account the allocation of street segments to observers. Variance components in Table 4C.1 in the Appendix of this chapter indicate that in a traditional econometrics model, it appears that approximately 10.7 percent of the total variance in physical disorder reflects differences between neighborhoods, compared with 6.3 percent in the cross-classified model, and 27.7 percent reflects differences between street segments, compared with 12.4 percent in the cross-classified model. Differences for social disorder are less substantial. A traditional econometrics model (as presented in Table 4C.1 in the Appendix) indicates that about 17.7 percent of the variance in social disorder is at neighborhood level, compared with 17.2 percent in the cross-classified model, and that about 29.9 percent is at street segment level, compared with 24.2 percent in the cross-classified model.

The intra-class correlation coefficients (ICCs), presented in Table 4.2, express the extent to which street segments within one neighborhood that are *observed by different observers* are alike (physical disorder: 6.3 percent, social disorder: 17.2 percent). These ICCs can be compared to the ICC neighborhood*observers values, which express the likeness of street segments within one neighborhood *observed by the same observer*. These ICCs are 24.8 and 24.9 percent for physical and social disorder (.248 and .249), respectively. Thus, street segments within one neighborhood appear to be more similar when they are observed by the *same* observer (physical disorder: 24.8 percent; social disorder: 24.9 percent) compared to when they are observed by *different* observers (physical disorder: 6.3 percent; social disorder: 17.2 percent). This indicates the presence of observer bias.

Table 4.2. Variance components, internal consistency and lambdas for physical disorder and social disorder ($N = 1422$ street segments)

	Physical disorder		Social disorder	
	Mean	(SE)	Mean	(SE)
Intercept	-1.732	(.077)	-6.620	(.160)
Variance between street segments	.650	(.009)	1.569	(.230)
Variance between neighborhoods	.332	(.005)	1.115	(.106)
Variance between observers	.965	(.243)	.498	(.153)
Total variance	5.237	-	6.472	-
% of variance street segment	12.412	-	24.243	-
% of variance neighborhood	6.340	-	17.228	-
% of variance observer	18.427	-	7.695	-
ICC neighborhood ^a	.063	-	.172	-
ICC neighborhood*observers ^b	.248	-	.249	-
Lambda street segment	.806	-	.886	-
Lambda neighborhood	.389	-	.683	-
Cronbach's alpha	.570	-	.304	-
DIC	7456.170	-	1450.890	-

NOTES: Variance at level 1 (items) is fixed at $\pi^2/3$. Results obtained from empty cross-classified multilevel logistic regression models.

ABBREVIATIONS: SE = standard error; ICC = intra-class correlation; DIC = Deviance Information Criterion.

^aICC neighborhood: variance neighborhood/total variance.

^bICC neighborhood*observers: (variance observers + variance neighborhood)/ total variance.

Ecological reliability

We then assessed the ecological reliability of the disorder constructs at street segment level and neighborhood level, while taking into account the allocation of street segments to different observers. To do so, formulas were developed to calculate reliability measures, lambdas, that incorporate the cross-classified nesting of street segments in neighborhoods and observers. These formulas are presented in Appendix 4A at the end of this chapter. The ecological reliability measures (lambdas) for the disorder constructs are presented in Table 4.2. These lambdas are based on empty cross-classified models¹⁴. The values of lambda parameters vary, similar to the Cronbach's

14 These lambdas are not compared with lambdas from other models (e.g., models that include explanatory variables), because the fixed residual variance at level one complicates the comparison of sequential models (Snijders and Bosker, 2012, section 17.3.5).

alpha, between 0 and 1, where 0 is 'not reliable' and 1 is 'highly reliable.' Each street segment and neighborhood gets its own lambda; Table 4.2 presents the mean lambdas. The street segment lambda differs with the variance on street segment level and the number of items per scale: Equation 2 in Appendix 4A. On average, the street segment lambdas are acceptably high for both physical and social disorder (respectively .806 and .886). The neighborhood lambdas differ with the unexplained variance in a neighborhood, with the amount of street segments that were observed in the neighborhood and the number of observers that observed the street segments in that neighborhood: Equation 1 in Appendix 4A. The neighborhood lambdas for physical disorder vary between .137 and .676. For social disorder, they vary between .310 and .911. The average neighborhood lambda is acceptable for social disorder (.683), but rather low for physical disorder (.389). This indicates that the number of street segments or observers per neighborhood was low in the current study.

The key findings with regard to the proposed lambdas, which take into account the allocation of street segments to observers, are summarized in Figure 4.2. Figure 4.2 shows how the neighborhood reliability scale for physical disorder behaves with varying numbers of street segments and observers per neighborhood. The graph clearly illustrates how important it is to include a sufficient number of observers in the data collection. Although the addition of street segments per neighborhood results in some improvement of the ecological reliability, the inclusion of extra observers is far more relevant. To give an example, imagine a data collection where four observers observe ten street segments on average per neighborhood. The average neighborhood lambda for physical disorder, given the variance components found in the current study, would then be .484. To improve reliability, one could either *increase the number of street segments per neighborhood*, where an increase of twenty street segments, resulting in an average of 30 street segments per neighborhood, would result in a lambda of .544. Alternatively, one could *increase the number of observers per neighborhood*, where the inclusion of two extra observers per neighborhood—for a total of six—would result in a lambda of .549. To obtain neighborhood lambdas of .6 or higher, a study would need at least 14 different street segments per neighborhood, allocated to at least 7 different observers, or 20 different street segments per neighborhood allocated to at least 6 different observers, given the variance components found in the current study.

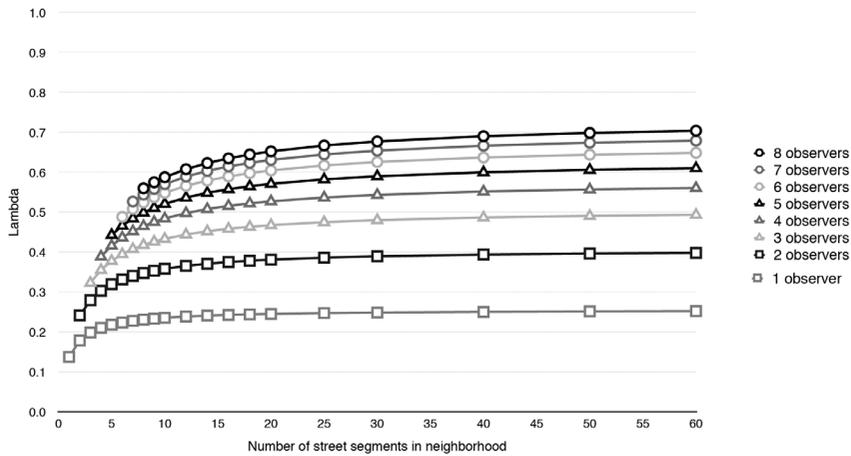


Figure 4.2. Neighborhood reliability (lambda) for physical disorder as a function of sampled street segments and number of observers where the number of items is constant

Observer characteristics

The findings of the variance components analyses that we discussed previously suggested that the disorder observations differed between observers. We now turn to attempting to explain these differences by examining the influence of five observer characteristics: Urban background, gender, perceived chance of victimization, perceived response to threat, and general feeling of safety at observation locations. As the number of observers was relatively low ($N = 13$), only one explanatory variable at a time was added to the observer level of the model. Results are presented in Table 4.3, and in Tables 4F.1 (physical disorder) and 4F.2 (social disorder) in the supplementary material. Results of additional Wald tests are presented in Table 4D.1 in the Appendix of this chapter.

Of the investigated observer characteristics, only one appeared to affect the disorder observations, namely the urbanicity of the area where the observers grew up; their urban or rural background (results are presented in Table 4.3). The other characteristics did not appear to be relevant (the results for these characteristics are presented in Tables 4F.1 and 4F.2 in the supplementary material). It is possible that due to the small number of observers, we have overlooked the effects of these characteristics. Nevertheless, based on these

findings, we have to reject Hypothesis 3 regarding the effect of perceived vulnerability on the observation of disorder.

Regarding urban background, the results presented in Table 4.3 indicate that observers who grew up in moderately rural areas observed less physical disorder than observers from very strongly urban backgrounds ($\beta_{\text{moderately urban}} = -1.456, p < .05$). Also, we found that observers from strongly urban backgrounds observed less social disorder than observers from very strongly urban backgrounds ($\beta_{\text{strongly urban}} = -1.237, p < .05$). These findings contradict our Hypothesis 2, that observers from very strongly urban areas would observe fewer signs of physical and social disorder.

Observational conditions

We further investigated whether the conditions under which the observations took place would affect the disorder observations. Six observational conditions were examined: The time of day, day of the week, weather, the number of observations the observer had conducted prior to the observation across the entire project and during that day (as an expression of socialization or fatigue experienced by the observer at the moment of observation) and how safe the observer felt at that location. Results are presented in Table 4.3¹⁵ and Table 4G.1 in the supplementary material. The latter presents models that do not include observers' urban backgrounds. Results of additional Wald tests are presented in Table 4D.1 in the Appendix of this chapter.

¹⁵ The results regarding observers' urban backgrounds should only be interpreted with findings from models that do not include the observational conditions. The coefficients for the variables at observer level, here urban background, are biased by the addition of the variables at street segment level (e.g., time, day, weather). This is due to our dichotomous dependent variables; the level one variance is fixed at $\pi^2/3$, therefore macro-level parameters change after adding micro-level variables (Snijders and Bosker, 2012, section 17.3.5).

Table 4.3. Bias by observer characteristics and observational conditions (N = 1422 street segments)

Observer level	Physical disorder				Social disorder							
	β	(SE)	OR	β	(SE)	OR	β	(SE)	OR			
<i>Urban background</i>												
Very strongly urban (ref)												
Strongly urban	-.501	(.426)	.606	-.570	(.415)	.556	-1.237*	(.332)	.290*	-.948	(.360)	.388
Mixed rural and urban	.658	(.413)	1.931	.851	(.403)	2.342	-.057	(.268)	.945	.440	(.305)	1.553
Moderately rural	-1.456*	(.373)	.233*	-1.370*	(.336)	.254*	-1.019	(.288)	.361	-.595	(.329)	.552
Rural	-.893	(.434)	.409	-.932	(.384)	.394	-1.014	(.324)	.363	-.760	(.387)	.468
<i>Street segment level</i>												
<i>Time of day</i>												
10.00-11.00				-.024	(.029)	.976				-.454	(.217)	.635
11.00-12.00				-.134	(.022)	.875				-.368	(.166)	.692
12.00-13.00 (ref)												
13.00-14.00				-.077	(.022)	.926				.663	(.138)	1.941
14.00-15.00				.188	(.027)	1.207				1.150*	(.163)	3.158*
15.00-16.00				.400	(.042)	1.492				.970*	(.222)	2.638*
<i>Day of week</i>												
Monday				-.077	(.026)	.926				-.353	(.162)	.688
Tuesday				.361*	(.022)	1.435*				.014	(.144)	1.014
Wednesday (ref)												
Thursday				.274	(.023)	1.315				.386	(.127)	1.471
Friday				.004	(.025)	1.004				.218	(.144)	1.244
<i>Weather</i>												
Sunny				-.083	(.021)	.920				.747*	(.118)	2.111*
Sunny with clouds				-.168	(.019)	.845				-.263	(.136)	.769
Cloudy with sun (ref)												

With regard to physical disorder (Table 4.3), we found that weather conditions did not affect systematic observations. Time of day appeared to be relevant, in that more disorder was observed between 3.00 and 4.00p.m. than earlier in the day (more than between 11.00a.m. and noon: $\chi^2 = 5.592$; and more than between 1.00 and 2.00p.m.: $\chi^2 = 6.223$, Table 4D.1 in the Appendix of this chapter). Day of the week appeared to be relevant, in that there was more physical disorder observed in the middle of the week than on Mondays or Fridays. More physical disorder was observed on Tuesdays than on Mondays ($\chi^2 = 7.211$, Table 4D.1 in the Appendix), more disorder was observed on Thursdays than on Mondays ($\chi^2 = 4.452$, Table 4D.1 in the Appendix), more disorder was observed on Tuesdays than on Fridays ($\chi^2 = 4.776$, Table 4D.1 in the Appendix), and more disorder was observed on Tuesdays than on Wednesdays ($\beta_{\text{Tuesday}} = .361, p < .05$, Table 4.3). Furthermore, we found that observers reported less physical disorder as their number of conducted observations increased (Table 4.3). Although these effects were modest, they were visible both for the number of observations across the entire project ($\beta_{\text{Nr of observation total}} = -.003, p < .05$), and for the number of observations that had been conducted that day ($\beta_{\text{Nr of observation that day}} = -.035, p < .05$). These findings support Hypothesis 1 and imply that fatigue or observer socialization may indeed be relevant factors in systematic social observations of physical disorder. A larger effect was found for the effect of observers' feeling of safety at the observation location; the safer observers felt at a location, the less physical disorder they reported ($\beta_{\text{Feeling at location}} = -.276, p < .05$). Note, however, that observers may feel safer in locations with fewer signs of physical disorder. We replicated all models without that variable, but its inclusion did not seem to affect the coefficients of the other predictors. Results of these additional analyses are presented in Table 4H.1 in the supplementary material.

With regard to social disorder (Table 4.3), we found that the time of day and weather conditions affected the observations, but not day of the week. As we would expect, social disorder was more often observed in the afternoon than in the morning (significantly more often after 2.00p.m. than around noon: $\beta_{2-3pm} = 1.150, p < .05$; $\beta_{3-4pm} = .970, p < .05$, significantly less often before noon than after 1.00p.m., as illustrated by the findings of the Wald tests in Table 4D.1 in the Appendix), and more often when it was sunny compared with when it was sunny with clouds ($\chi^2 = 7.166$, Table 4D.1 in the Appendix), cloudy ($\beta_{\text{sunny}} = .747, p < .05$, Table 4.3) or grey ($\chi^2 = 9.911$, Table 4D.1 in

the Appendix). We expect that these conditions are more predictive of the occurrence of social disorder than that they explain bias in observations: People are more likely to be outside after work or school, in the afternoon, and when the weather is nice. Furthermore, we found that observers reported less social disorder as their number of conducted observations increased across the project (Table 4.3: $\beta_{Nr\ of\ observation\ total} = -.006, p < .05$), which supports the notions of observer socialization or fatigue. We also found that observers' feeling of safety was negatively associated with the observed social disorder; the safer the observer felt at a location, the less social disorder was reported (Table 4.3: $\beta_{Feeling\ at\ location} = -.589, p < .05$). But, as we stated previously, the presence of disorder may affect observers' feeling of safety. See also the models without this variable in Table 4H.1 in the supplementary material, which show similar findings.

Comparing measures of disorder

In the current study, we proposed a new cross-classified model to account for observer bias in disorder constructs at the street segment and neighborhood levels. In this section, we will illustrate how these new disorder constructs differ from constructs that were created by the traditional econometrics method (Raudenbush and Sampson, 1999), and the often applied method of simply taking means. Our new measures, to which we will refer as 'cross-classified measures', were created by taking the posterior means of the models presented in Table 4.3 (including observers' urban background and the observational conditions). The measures obtained through traditional econometrics, to which we will refer as 'econometrics measures', were created by taking the posterior means of the models presented in Table 4E.1 in the supplementary material (including observational conditions). The measures obtained by simply taking mean scores, to which we will refer as 'simple mean measures', were created by taking the means of all items to construct street segment measures, and by taking the means of these street segment measures per neighborhood to construct neighborhood measures. We compared the different disorder measures in three ways.

First, we compared the *rank order of neighborhoods* based on the different disorder measures. We present one example in this chapter (in Figure 4.3), where we compared the cross-classified measures with the

ecometrics measures for neighborhood constructs of physical disorder. The left side of Figure 4.3 shows the scatterplot of all neighborhoods, ranked from the lowest to the highest score on the ecometrics measure (x-axis) and the cross-classified measure (y-axis). The right side of Figure 4.3 shows a more precise comparison of the rank order differences. If observer bias did not affect a neighborhood’s ranking of physical disorder, all points would lie on the diagonal of the scatterplot, and thus most ranking differences would be close to zero. However, the scatterplot and histogram show that taking observer bias into account changes the neighborhood’s score dramatically. When accounting for observer bias, about half of all neighborhoods receive a higher ranking. These neighborhoods actually have more physical disorder than a standard ecometrics approach would have led us to believe. On the other hand, about half of all neighborhoods are also perceived to experience more physical disorder than they actually do.

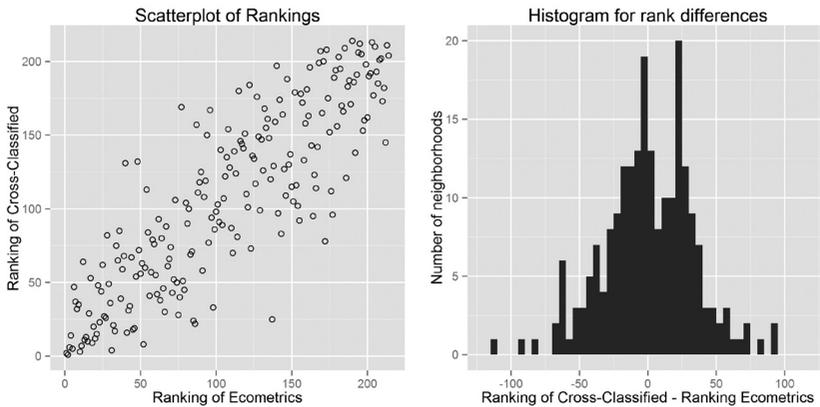


Figure 4.3. Comparing rank order of neighborhoods based on measures for physical disorder as derived from a traditional ecometric model with those derived from the proposed cross-classified model

Second, we inspected the *correlations between the different disorder measures*. As shown in Table 4.4, the measures correlated relatively highly at neighborhood level. For the neighborhood constructs of physical disorder, we found correlations of .795 and .857 between the cross-classified measure and the simple mean and ecometrics measures, respectively. For the neighborhood constructs

of social disorder, we found correlations of .721 and .895 between the cross-classified measure and the respective simple mean and econometrics measures. Correlations were lower at the street segment level. The cross-classified measure for physical disorder at street segment level showed a correlation of .819 with the simple mean measure, and of .296 with the econometrics measure. For social disorder at street segment level, we found correlations of .581 and .542 between the cross-classified measure and the simple mean measure and econometrics measure, respectively. Disregarding observer bias thus affects disorder measures more strongly at street segment level than at neighborhood level. Nevertheless, at both levels, we find correlations that differ from 1.000, suggesting that it matters for disorder estimates whether or not one takes into account the allocation of street segments to observers.

Third and finally, we examined how correlations with *crime rates* differed across the three disorder measures. The correlations are presented in Table 4.4. At the street segment level, we found that disorder-crime correlations, as based on the cross-classified measures for disorder, were overall slightly higher than those based on the simple mean and econometrics measures. For example, the physical disorder-crime correlation at street segment level based on the cross-classified model was .287, whereas that correlation based on the econometrics model was .240. On the other hand, at the neighborhood level, we found that disorder-crime correlations as based on the cross-classified measures for disorder were generally lower than those based on the simple mean and econometrics measures. For example, the physical disorder-crime correlation at neighborhood level based on the cross-classified model was .299, whereas that correlation based on the econometrics model was .403. These patterns were visible for physical disorder as well as for social disorder. These correlations therefore indicate that inadequate consideration of observer bias leads to slightly underestimating the disorder-crime association at street segment level, and to overestimating that association at neighborhood level. The differences between the disorder-crime associations across levels of aggregation may therefore be less substantial than appeared to be the case in previous studies. Overall, we found that the disorder-crime correlations were slightly stronger at the neighborhood level than at the street segment level. For the cross-classified measures for physical disorder, these correlations were respectively .299 and .287 for neighborhood and street segment level, and for social disorder the correlations were respectively .340 and .224.

Table 4.4. Spearman's rho correlations between different measures of disorder and crime at street segment level and neighborhood level ($N_{\max} = 1422$ street segments, 253 neighborhoods)

	Simple mean		Ecometrics		Cross-classified	
	Physical disorder	Social disorder	Physical disorder	Social disorder	Physical disorder	Social disorder
Street segment						
Physical disorder (sm)	1.000**	.146**	.286**		.819**	
Social disorder (sm)	.146**	1.000**		.299**		.581**
Physical disorder (eco)	.286**		1.000**	.165**	.296**	
Social disorder (eco)		.299**	.165**	1.000**		.542**
Physical disorder (cc)	.819**		.296**		1.000**	.120**
Social disorder (cc)		.581**		.542**	.120**	1.000**
Crime	.290**	.222**	.240**	.268**	.287**	.224**
Neighborhood						
Physical disorder (sm)	1.000**	.235**	.930**		.795**	
Social disorder (sm)	.235**	1.000**		.811**		.721**
Physical. disorder (eco)	.930**		1.000**	.286**	.857**	
Social disorder (eco)		.811**	.286**	1.000**		.895**
Physical disorder (cc)	.795**		.857**		1.000**	.224**
Social disorder (cc)		.721**		.895**	.224**	1.000**
Crime	.382**	.506**	.403**	.388**	.299**	.340**

NOTES: The *simple mean measures* for disorder are the average scores of items at street segment level and averages of street segments at the neighborhood level. The *ecometrics measures* for disorder are the posterior means from the hierarchical multilevel models that control for observational conditions (as presented in Table 4E.1 in the supplementary material). The *cross-classified measures* for disorder are the posterior means from the cross-classified models that control for observers' urban background and observational conditions (as presented in Table 4.3). *Crime* is measured as the registered number of offenses in public places that have been committed between 2007 and 2009.

ABBREVIATIONS: sm = simple mean; eco = traditional ecometrics; cc = cross-classified.

* $p < .05$; ** $p < .01$ (two-tailed).

Discussion and conclusion

The correct measurement of disorder is an important endeavor in criminology. Disorder may cause fear of crime (Kelling and Coles, 1996; Perkins and Taylor, 1996) and has been related to crime as cause and as consequence (Bogges and Maskaly, 2014; Skogan, 1990). However, empirical studies regarding disorder are plagued by several issues, including aggregation bias and disagreement about the best method of measurement. The aim of the current study was to examine the extent to which SSO is a reliable and valid measurement method for disorder on different units of analysis. In accounting for observer bias, the study elaborated on the ecometrics model of Raudenbush and Sampson

(1999), and proposed a cross-classified model that accounts for the allocation of street segments to observers. The study thereby builds on a long tradition of discovering and solving methodological and statistical problems within ecological crime research (for overviews see Sampson and Lauritsen, 1994; Weisburd, Bernasco, and Bruinsma, 2009b) and connects to state-of-the-art methods by applying cross-classified modeling and focusing on smaller units of analysis (street segments) alongside the more traditionally used unit of the neighborhood (Weisburd, Groff, and Yang, 2012).

Methodological implications

An important implication of the current study is its contribution to the 'social science of ecological assessment', by gauging the effect of observer bias in systematic social observations. With the introduction of a method to reliably aggregate variables to a higher level, Raudenbush and Sampson (1999) made a vital contribution to ecological crime research. Our study aims to refine their method by extending the traditional econometrics model with a level for observers, crossed with neighborhoods at the highest level of the model. The proposed model thereby extends the existing measures in taking into account the allocation of street segments to observers. Our findings of variance components analyses indicate that neighborhoods may be more alike than we would think based on traditional methods: Part of the variance in disorder is actually explained by differences between observers. Furthermore, application of the proposed cross-classified model showed to be definitive for the correlations between disorder and police recorded crime. Traditional methods of aggregation, such as the simple means method or traditional econometrics, appeared to underestimate the disorder-crime association at street segment level and overestimate the association at the neighborhood level.

These findings bring about practical implications for future data collections. To keep down costs, most studies prefer to let observers observe additional street segments, rather than training more observers. Our findings indicate, however, that the reliability of the collected data strongly improves with the use of more observers; future SSO studies can acquire neighborhood reliability scores for physical disorder of 0.6 and higher if they select 14 street segments per neighborhood and allocate these to 7 different observers per

neighborhood, or if they select 20 street segments per neighborhood and allocate these to 6 different observers per neighborhood. Our findings thus imply that more observers are not strictly necessary, providing that thought is given to the allocation of these observers to observation locations.

Reliability issues that arise from inadequate allocation of locations to observers may also be relevant to other data collection methods, although perhaps to a lesser extent. Fatigue and socialization are likely to plague any data collection method that makes use of face-to-face interview or observer techniques, and other issues may be relevant depending on the method and topic of interest. For example, when collecting data based on community surveys that are conducted in face-to-face interviews or based on key informants' interviews, it may be relevant whether interviewers vary in their emotional approach and interactions with subjects. These and other differences between interviewers potentially translate into less ecologically reliable measures if no thought is given to the allocation of interviewers over areas.

Similarly, our findings may have implications for studies into phenomena other than physical and social disorder. Observer bias is a problem that extends to almost any phenomenon that is studied through observation. Previous studies in criminology have applied (Systematic) Social Observation to examine shoplifting (Buckle and Farrington, 1984), police behavior (Mastrofski, Snipes, and Supina, 1996), and aggression in barrooms (Graham et al., 2006) among other examples. Our findings suggested that, for the observation of physical and social disorder, the urban background of observers was a factor of influence. We further found indications of intra-observer bias, such as fatigue. We expect that observer socialization, fatigue, and observers' prior experiences and unconscious perspectives may also shape observations of other topics. To avoid observer bias as much as possible, we suggest that future SSO studies, regardless of their topic, select a minimum number of observers, pay attention to allocation of observers over locations, subjects or events, offer extensive training prior to observations and organize feedback meetings during the period of data collection. For some topics, it may be necessary or fruitful to select or reject observers based on their pre-existing attitudes or expertise; previous studies have shown that police officers and college students differed significantly in their observations of police behavior (Reiss, 1971) and social disorder (Yang and Pao, 2015).

Fatigue and observer socialization may be avoided or reduced by ensuring short observation sessions, restricting the maximum number of observations per observer and by organizing discussions among the observers about changed perceptions and feelings.

Finally, the current study contributes to the growing body of literature about aggregation bias and the prediction of crime. It is now widely recognized that correlations depend on the level of (geographical) aggregation (Openshaw, 1984; Robinson, 1950). However, despite this knowledge, it is still unclear what the appropriate level of analysis should be for relations between crime and important predictors of crime, if an appropriate level of analysis can even be said to exist (Hipp, 2007; Weisburd, Bernasco, and Bruinsma, 2009a). In the current study, we found that if we applied the proposed cross-classified model to aggregate disorder—thus accounting for the allocation of street segments to observers—differences in disorder-crime correlations across levels of aggregation (street segment level and neighborhood level) were less substantial, compared with our results if we applied more traditional methods to aggregate disorder. Although this finding needs further investigation, it suggests that correction for systematic sources of bias such as observational conditions and observer characteristics in SSO may help to reduce the problem of aggregation.

Limitations and future research

One limitation of the current study is the small number of observers; thirteen observers conducted all observations in the greater The Hague area. This small number decreases the statistical power of the estimation at the observer level and may therefore only acknowledge extremely large effects of observer characteristics. The current study should therefore be viewed as a first step in explaining observer bias in systematic social observations of disorder. Nonetheless, the study is an exemplar of how SSO studies of disorder are generally organized: A handful of observers, often students, are asked to observe hundreds of locations (Schaefer-McDaniel et al., 2010). Our findings entail a cautionary note for such studies regarding the allocation of observers over locations. Further research is necessary to investigate a wider range of observer characteristics among a larger group of observers. Findings of previous studies on perceptions of disorder, based

on data from community surveys, suggest that it might be interesting to investigate observers' age, ethnic background and marital status (Franzini et al., 2008; Hinkle and Yang, 2014; Hipp, 2010; Latkin et al., 2009; Sampson and Raudenbush, 2004; Wallace, Louton, and Fornango, 2015). These characteristics were not incorporated in the current study, because there was insufficient variation among the observers on these features. It would also be interesting to further gauge whether observer socialization effects are dependent on observer characteristics. It is possible that observers from rural backgrounds show stronger effects over time as they grow accustomed to urban settings, compared with their colleagues from urban backgrounds who were already familiar with the urban setting.

A second limitation was the scarcity of observations of social disorder, which restricted the variance in these observations and made the analyses more prone to inaccuracy. Systematic social observation might be less suitable for measuring social disorder, due to its instantaneous character. Whereas physical disorder remains mostly unchanged during the course of the day, the observation of social disorder depends largely on the time, the day (weekday or weekend) and the duration of the observation. We decided to restrict the observations to workdays between 10.00a.m. and 4.00p.m., because small signs of physical disorder would be better visible in daylight, and because we did not want rush hours to affect the coding of traffic. This decision has undoubtedly affected the chance to observe social disorder. Our findings regarding the effects of 'time of day' and 'day of week' on social disorder observations should thus be interpreted in light of this restriction. Future study of disorder may require separate data collections for physical and social disorder, where physical disorder is observed in daylight and social disorder in the evenings.

Concluding remarks

Despite these limitations, the study makes some important contributions to the literature on systematic social observations, to studies on disorder and crime and, more generally, to the 'social science of ecological assessment'. As a final remark, we want to emphasize the need for further attention to the measurement of disorder in micro settings such as street segments. Street segments may be more appropriate units to understand

environmental influences on individual behavior, because they are small enough to affect individual behavior: “Individuals’ actions and development are only influenced by the environments they can access with their senses” (Oberwittler and Wikström, 2009: 57), and those environments are generally smaller than the neighborhood or city where people reside. Street segments may serve as behavior settings (Barker, 1968; Taylor, 1987), because people who live or otherwise spend time within street segments become aware of each other’s routines and standing patterns of behavior (Taylor, 1987). Measurement of phenomena at smaller units also enables the aggregation to a wider variety of higher units (Brantingham et al., 2009; Oberwittler and Wikström, 2009), which is necessary to truly grasp the crime-disorder relationship (Hipp, 2007). Further research is necessary to determine the minimal amount of systematic social observations, key informant interviews and resident surveys needed to construct reliable measures at these smaller units. The need for assessment at micro settings in the crime-disorder debate makes measurement of disorder, more than ever, a daunting task.

Appendices Chapter Four

- Appendix 4A. Formulas
- Appendix 4B. Descriptive statistics
- Appendix 4C. Variance components traditional econometrics
- Appendix 4D. Wald tests

Supplementary material

(enclosed in a separate document available from the author):

- Appendix 4E. Traditional econometrics
- Appendix 4F. Observer characteristics
- Appendix 4G. Observational conditions
- Appendix 4H. Models without variable ‘feel’

Appendix 4A

The below formulas express construct reliability of measures at neighborhood level in Equation 1 and street segment level in Equation 2:

$$\lambda_k = \frac{\omega}{\omega + \frac{\nu}{O_k} + \frac{\tau}{J_k} + \frac{\sigma}{nJ_k}} \quad [1]$$

$$\lambda_{jk} = \frac{\omega + \nu + \tau}{\omega + \nu + \tau + \frac{\sigma}{n}} \quad [2]$$

With:

λ_k = reliability of neighborhood construct

λ_{jk} = reliability of street segment construct

ω = variance at the neighborhood level

ν = variance at observer level

τ = variance at street segment level

σ = variance at item level (fixed at $\pi^2/3$)

O_k = number of observers per neighborhood

J_k = number of street segments per neighborhood

n = number of items per street segment

Appendix 4B

Table 4B.1. Descriptive statistics of observer characteristics and observational conditions

	N	Mean	(SD)	Min	Max
Observational conditions					
Time of day					
10.00-11.00	1422	.149	(.356)	.000	1.000
11.00-12.00	1422	.210	(.408)	.000	1.000
12.00-13.00	1422	.196	(.397)	.000	1.000
13.00-14.00	1422	.190	(.392)	.000	1.000
14.00-15.00	1422	.158	(.364)	.000	1.000
15.00-16.00	1422	.098	(.297)	.000	1.000
Day of week					
Monday	1422	.213	(.410)	.000	1.000
Tuesday	1422	.166	(.372)	.000	1.000
Wednesday	1422	.279	(.448)	.000	1.000
Thursday	1422	.170	(.376)	.000	1.000
Friday	1422	.173	(.378)	.000	1.000
Weather conditions					
Sunny	1422	.277	(.448)	.000	1.000
Sunny with clouds	1422	.271	(.445)	.000	1.000
Cloudy with sun	1422	.215	(.4110)	.000	1.000
Drizzle rain	1422	.013	(.112)	.000	1.000
Grey and cloudy	1422	.224	(.417)	.000	1.000
Number of observation of observer total	1422	78.459	(59.458)	1.000	226.000
Number of observation that day	1422	7.930	(5.819)	1.000	35.000
Feeling of safety at location ^a	1422	.000	(.498)	-2.980	1.370
Observer characteristics					
Gender (male = 1)	13	.539	(.519)	.000	1.000
Urban background	11	3.091	(1.446)	1.000	5.000
Perceived chance of victimization	12	5.778	(.656)	4.670	7.000
Perceived response to threat	12	2.167	(.718)	1.000	3.000
General feeling of safety	13	4.293	(.476)	3.630	4.980

ABBREVIATIONS: SD = standard deviation; Min = minimum; Max = maximum.

^a Expressed as deviation of observers' general feeling of safety across all observed locations.

Appendix 4C

Table 4C.1. Variance components, internal consistency and lambdas for physical and social disorder ($N = 1422$ street segments)

	Physical disorder		Social disorder	
	Mean	(SE)	Mean	(SE)
Intercept	-1.613	(.007)	-6.519	(.117)
Variance between street segments	1.481	(.021)	1.874	(.288)
Variance between neighborhoods	.573	(.012)	1.114	(.110)
Total variance	5.344	-	6.278	-
% of variance street	27.714	-	29.851	-
% of variance neighborhood	10.723	-	17.745	-
ICC neighborhood ^a	.279	-	.373	-
Lambda street segment	.814	-	.879	-
Lambda neighborhood	.623	-	.733	-
Cronbach's alpha	.570	-	.304	-
DIC	7701.71	-	1461.54	-

NOTES: Variance at level 1 (items) is fixed at $\pi^2/3$. Results obtained from empty hierarchical three-level logistic models.

ABBREVIATIONS: SE = standard error; ICC = intra-class correlation; DIC = Deviance Information Criterion.

^aICC neighborhood: variance neighborhood/total variance.

Appendix 4D

Table 4D.1. Results of Wald tests (χ^2) comparing categories of observer characteristics and observational conditions

	Physical disorder	Social disorder
Urban background		
Strongly urban-mixed rural and urban	5.053*	6.469*
Strongly urban-moderately rural	1.852	.359
Strongly urban-rural	.320	.097
Mixed rural and urban-moderately rural	16.054**	3.980*
Mixed rural and urban-rural	8.916**	4.630*
Moderately rural-rural	.589	.080
Time of day		
10.00-11.00	.480	.035
10.00-13.00	.077	5.297*
10.00-14.00	1.003	9.064**
10.00-15.00	2.774	5.661*
11.00-13.00	.126	6.275*
11.00-14.00	3.094	11.137**
11.00-15.00	5.592*	6.484*
13.00-14.00	2.868	1.898
13.00-15.00	6.223*	.528
14.00-15.00	1.349	.208
Day of week		
Monday-Tuesday	7.211**	.714
Monday-Thursday	4.452*	3.153
Monday-Friday	.261	1.924
Tuesday-Thursday	.300	.863
Tuesday-Friday	4.776*	.248
Thursday-Friday	2.583	.186
Weather conditions		
Sunny-sunny with clouds	.335	7.166**
Sunny-drizzle rain	.987	2.019
Sunny-grey	.795	9.911**
Sunny with clouds-drizzle rain	.621	.536
Sunny with clouds-grey	.092	.067
Drizzle rain-grey	.465	.438

NOTES: Comparing coefficients of Models as presented in Table 4.3.

**p < .01; *p < .05 (two-tailed).



Part III.

Beyond Unstructured Socializing:
Specifying Criminogenic Behavior Settings





Chapter Five.

Responsibilities of Places

Hoeben, Evelien M., and Frank M. Weerman. 2014. Situational conditions and adolescent offending: Does the impact of unstructured socializing depend on its location?
European Journal of Criminology 11(4): 481-499.



Responsibilities of Places

Chance is sometimes a wonderful accomplice in crime – Émile Gaboriau

Empirical studies have confirmed that individuals who spend more time in ‘unstructured socializing’ have higher delinquency rates (e.g., Anderson and Hughes, 2009; Haynie and Osgood, 2005; Osgood and Anderson, 2004; Osgood et al., 1996). However, previous research has paid little attention to the *location* where unstructured socializing occurs. We do not know whether, for example, unstructured socializing on the street has the same impact on offending as unstructured socializing in other locations. This limits our understanding about when and why spending time with peers has an impact on adolescent delinquency.

The current study specifically investigates the role of the location in the association between unstructured socializing and adolescent delinquency. ‘Location’ does not refer to a geographical space. In the current study, ‘location’ refers to a distinction of places based on their function. The effect of unstructured socializing on delinquency is investigated for three categories of location: Private, semi-public and public. These locations are further classified into public entertainment settings, public transportation, other semi-public settings, streets and squares, shopping centers and open spaces. The study builds on the unstructured socializing approach of Osgood et al. (1996) and on the classification of responsibilities of places of Felson (1995). To control for selection effects that occur if crime prone individuals prefer to spend time in settings that do not require discipline or supervision, we use a random intercept panel model.

Data for the current study were collected with a *space-time budget interview*. This instrument was developed to assess hourly activities and whereabouts of adolescents (Wikström and Butterworth, 2006; Wikström et al., 2012a) and it enables us to determine the exposure to unstructured socializing in different locations. With two-wave data from space-time

budget interviews among 615 adolescents in The Hague (the Netherlands), we will investigate: 1) Whether involvement in unstructured socializing is positively associated with delinquency and 2) whether the location where unstructured socializing takes place specifies this association.

Unstructured socializing

Osgood et al. (1996) coined the term ‘unstructured socializing’ in a paper in which they applied a routine activity approach to explaining individual behavior. Both the routine activity theory (Cohen and Felson, 1979) and the lifestyle theory (Hindelang, Gottfredson, and Garofalo, 1978) focus on how routine behavior exposes individuals to certain situations, which shapes the risk of becoming involved in crime (as victim or offender). The lifestyle theory puts more emphasis on personal antecedents that affect people’s choices to engage in activities, for example, their age, gender and other demographics; (economic) constraints; role expectations; adaptations to constraints and role expectations; and social associations. The routine activity theory, on the other hand, has a macro level perspective and emphasizes the role of everyday life and the convergence of people and situations (Maxfield, 1987). Osgood et al. (1996) apply the routine activity approach to individual behavior by interpreting activities in everyday life as a source of exposure to crime conducive situations. They assume that individuals who spend more time in crime conducive activities have higher deviance rates. Adolescent activities that present opportunities for delinquency are, according to Osgood et al. (1996), activities that include: 1) The presence of peers, 2) lack of structured activity and 3) the absence of authority figures. The *presence of peers* stimulates delinquency, because it makes delinquency easier and more rewarding. Osgood et al. (1996) state that peers serve as resources in delinquency: They can function as ‘back-ups’ or ‘look-outs’ when adolescents get into fights or commit theft. Peers may also serve as an audience, and therefore make delinquency rewarding in terms of status and reputation. The *lack of structured activity* stimulates delinquency, because it leaves time for deviant activity. According to Osgood and colleagues (1996: 641), “greater structure means that more time will be spent in designated ways”, and that this time will not be available for delinquency. The *absence of*

authority figures stimulates delinquency, because it limits social control and reduces the chance of ‘getting caught’. Osgood et al. (1996) use ‘unstructured socializing’ to refer to activities that incorporate these conditions.

The role of location: Responsibility of places

To theorize the possible role of location in the association between unstructured socializing and adolescent delinquency, we build on Felson’s (1995) classification of four kinds of responsibilities of places (which is, in turn, based on the distinction by Clarke, 1992, between formal, employee and natural surveillances). Felson (1995) distinguishes personal responsibility, assigned responsibility, diffuse job responsibility and general responsibility. *Personal responsibility* is the responsibility for places taken by those who own them or who are intimately related to the owners. Their incentive for reacting to crime is protecting their own property. *Assigned responsibility* for places is taken by employees who are assigned to take responsibility, for example, bouncers and receptionists. Their incentive to respond to crime is that they might be disciplined or even dismissed if something happens in the place under their watch. In the case of *diffuse job responsibility* (or ‘non-assigned job responsibility’), the responsibility for a place is taken by employees who are not explicitly assigned to do so. The incentive to take non-assigned job responsibility is protecting a location with which one has a personal connection. *General responsibility* for a place is taken by incidental passers-by or bystanders whose presence discourages crime or who respond to illegal behavior.¹⁶ There is no obvious incentive to respond to crime.

The four categories of responsibility correspond to four categories of urban space (Newman, 1972), that is: Private, semi-private, semi-public and public space, respectively. Felson (1995: 61) states that “it stands to reason that private spaces are primarily looked over by those with personal responsibility”. He further notes that ‘purely’ public spaces are monitored solely by persons with general responsibility.¹⁷ Felson (1995) finds semi-

¹⁶ The distinction between guardians, handlers and place managers is considered to be beyond the scope of this study.

¹⁷ The police, of course, also monitor public spaces. We leave the police out of our classification since they have responsibility for public spaces as well as for the other spaces.

private and semi-public more difficult to classify, since they may be within distant vision of owners, but may also be monitored both by assigned and non-assigned employees *and* by people who have no particular relation to the place but happen to be there. We therefore treat unstructured socializing in semi-private and semi-public spaces as one category.

Felson (1995) states that one's tendency to intervene in a situation varies with the type of responsibility and that the order in which one may expect directness of the response is: Personal responsibility (highest chance of direct intervention), assigned and non-assigned job responsibility, and general responsibility (lowest chance of direct intervention). Since these types of responsibility correspond to categories of urban space, the directness of response to crime is inherent in the function of a location. For example, crimes that take place in private spaces are more likely to evoke a direct response than crimes that take place in public spaces. This differentiation in responsibility and directness of response explains differential discouragement of delinquency in functional spaces. It can also be expected to influence the association between unstructured socializing and adolescent delinquency. We expect unstructured socializing to be most strongly related to delinquency when it occurs in public spaces and least strongly when it occurs in private spaces.

Specification of locations within private, semi-public and public spaces

The presented classification of spaces (private, semi-public and public) can be classified further into public entertainment settings, public transportation, other semi-public settings, streets and squares, shopping centers and open spaces. Previous studies suggest that unstructured socializing is particularly related to delinquency when it occurs in those locations, and these studies provide additional theoretical arguments for the crime conduciveness of those locations (Miller, 2013; Wikström and Butterworth, 2006; Wikström et al., 2010; Wikström et al., 2012a). *Public entertainment* settings incorporate spaces where substances (tobacco, alcohol or drugs) are available and that are usually more crowded than other locations. Those characteristics will evoke temptation and provocation, respectively (Wikström et al., 2010).

Locations with a public entertainment function include pubs, fast food restaurants and clubs. *Public transportation* incorporates transportation by bus, train and underground. These locations may offer temptation in the form of elements that can be vandalized or graffitied. Public transportation may also provoke function specific offences (as argued by Miller, 2013). *Other semi-public spaces* are, for example, schools, youth societies and sports clubs. *Streets* may offer temptation in the form of elements that can be demolished or graffitied. *Shopping centers* refers to both shopping malls and city shopping centers.¹⁸ Shopping centers contain a lot of ‘hot products’: Products that are concealable, removable, available, valuable, enjoyable and disposable (Clarke, 2002), which may tempt adolescents to steal. *Open spaces* are spaces that are further away from ‘watching eyes’ than the other public spaces, because they are characterized by a lack of buildings. Open spaces are, for example, public playing fields, parks and car parks. We expect unstructured socializing in public entertainment settings, public transportation or open spaces to be more strongly related to delinquency than unstructured socializing in other semi-public spaces, streets or shopping centers.

Previous studies

The association between involvement in unstructured socializing and delinquency is empirically confirmed in several studies. Osgood et al. (1996) were the first¹⁹ to demonstrate the association between delinquency and unstructured socializing. Employing a fixed effects analysis, their results suggested that the effect of unstructured socializing even holds with strong controls for between-person differences. Other studies that reported an association between unstructured socializing and delinquency are those of Anderson and Hughes (2009), Bernburg and Thorlindsson (2001), Haynie

¹⁸ In contrast to other countries, large shopping malls are rare in the Netherlands. It is far more likely for adolescents to spend time in a city shopping center than in a shopping mall. Because both locations contain the same temptation (the presence of expensive consumer goods), we refer to them as ‘shopping centers’.

¹⁹ Earlier studies had already confirmed associations between delinquency on the one hand and one or more of the components of unstructured socializing (time spent with peers, time spent unsupervised or time spent in unstructured leisure activities) on the other hand (e.g., Agnew and Petersen, 1989; Riley, 1987).

and Osgood (2005), Maimon and Browning (2010), Osgood and Anderson (2004) and Vazsonyi et al. (2002).²⁰

Interestingly, most of those studies did not explicitly operationalize unstructured socializing. The unstructured socializing approach explicitly defines three conditions of a situation in which time spent with peers is related to delinquency (presence of peers, absence of authority figures and lack of structured activity). Nevertheless, six of the seven studies did not measure these three conditions but assumed they are present in certain activities. For example, Osgood et al. (1996) included four unstructured activities in their analyses that are assumed to occur in the presence of peers and the absence of adults: Riding around in a car for fun, getting together with friends informally, going to parties, and spending evenings out for fun and recreation. Only some studies, for example that of Osgood and Anderson (2004), measured all three conditions with a single item: ‘In an average week, how many hours do you spend hanging around with your current friends, not doing anything in particular, where no adults are present?’

The *locations* where unstructured socializing takes place have hardly been studied. A few studies investigated *activity patterns* (not unstructured socializing) and found effects of the location where adolescents spent time on delinquency (Mahoney and Stattin, 2000; Messner and Blau, 1987; Miller, 2013; Svensson and Oberwittler, 2010; Thorlindsson and Bernburg, 2006). Other studies distinguished a few conditions of unstructured socializing (either with peers, without authority figures or in unstructured activity) and took into account the crime conducive nature of spending time in *public spaces* (e.g., Bernasco et al., 2013b; Steketee, 2012; Weerman et al., 2013). The studies by Wikström et al. considered particular crime conducive locations. Analyzing space-time budget data, Wikström and Butterworth (2006) found that most offending by adolescents occurs when they spend time with other peers and when they spend time in public spaces, primarily in streets, parks or recreational areas. Wikström et al. (2010) found a significant relationship between the exposure to time spent unsupervised with peers in public entertainment settings and self-reported crimes. Wikström et al. (2012a)

20 A number of studies consider a similar association, namely the effect of a risky lifestyle on delinquency. In these studies, participation in unstructured activities is viewed as an integral part of a risky lifestyle, as are consuming alcohol and involvement with delinquent peers (e.g., Svensson and Pauwels, 2010; Wikström and Svensson, 2008).

distinguished involvement in unstructured socializing in recreational settings (city centers and local centers) from involvement in unstructured socializing in outdoor public places (streets, parks and ‘moving around’).²¹ They found that the crime rate per thousand hours is higher during unstructured socializing on the street than during unstructured socializing in parks or ‘moving around’, for both the city center and local centers.

Current study

First and particularly, the current study contributes to the literature by examining in detail in which locations involvement in unstructured socializing is, and is not, related to delinquency. Different locations are distinguished explicitly. Second, the current study employs space-time budget data to get an adequate operationalization of unstructured socializing: A situation in which peers are present, authority figures are absent and there is a lack of structured activity. These space-time budget data are also used to precisely operationalize the locations where unstructured socializing occurs. Finally, the current study uses longitudinal data and two-level random intercept models to control for time-stable individual characteristics that might generate spurious relations between involvement in unstructured socializing in different locations and delinquency.

Based on the theoretical considerations addressed earlier in this chapter, the following hypotheses were formulated:

H1: Involvement in unstructured socializing is positively associated with delinquency.

H2: The location where unstructured socializing takes place specifies the relationship between unstructured socializing and delinquency, in the sense that:

²¹ Both studies (Wikström et al., 2010; Wikström et al., 2012a) also study the effect of exposure to areas with low collective efficacy. The division of areas into low, medium or high collective efficacy is considered to be beyond the scope of this study (but see Chapter 6).

H2A: Unstructured socializing in *private spaces* is less strongly related to delinquency than unstructured socializing in *semi-public or public spaces*.

H2B: Unstructured socializing in *public spaces* is more strongly related to delinquency than unstructured socializing in *semi-public or private spaces*.

H2C: Within the semi-public spaces, unstructured socializing in *public entertainment settings* and *public transportation* is more strongly related to delinquency than unstructured socializing in *other semi-public spaces*.

H2D: Within the public spaces, unstructured socializing in *open spaces* is more strongly related to delinquency than unstructured socializing in *streets or shopping centers*.

Data and methods

Data are used from the Study of Peers, Activities and Neighborhoods (SPAN) project. The SPAN project is designed to investigate associations between delinquency, individual characteristics, contextual influence and spatial activity patterns. In total, 40 secondary schools in the city of The Hague and its suburbs were approached and 10 schools agreed to participate in the study. Since the study is also aimed at exploring age differences in activity patterns and delinquency, it was conducted among 1st graders (aged approximately 12 and 13 years) and 4th graders (aged approximately 15 and 16 years). Of the 942 1st and 4th graders approached, 843 adolescents in the age range 11-17 years participated fully in the study in 2008-2009.

All 843 respondents were approached to participate in the study a second time in 2010-2011 (two years later) and 615 of them participated again. Therefore, the response rate for the second wave is 73 percent.²² The

22 The reasons for attrition varied for the 227 dropouts: 65 percent refused because they did not have time and/or were not willing to participate; for 11 percent contact approaches were given up after numerous attempts, 5 percent could not be reached at all because we could not find their contact information; in 9 percent of the cases, the parents of the respondent refused participation; and 10 percent exited for other reasons. One respondent did participate, but was later excluded from the analyses because half of the interview (the space-time budget part) went missing owing to technical difficulties.

dropouts were generally older than the participants (respectively, 14.9 and 13.9 years in the first wave, $T = 8.0$, $p < .01$, $r = .27$), they did *not* score higher on self-reported delinquency during the first wave than the participants (Mann-Whitney test: $Z = -1.550$, $p = .121$), but they *were* more involved in unstructured socializing during the first wave than the participants (respectively, median scores of 5.2 and 3.1, $Z = -2.477$, $p < .05$, $r = -.10$). This is owing to differences in unstructured socializing in public transportation; no differences were found for unstructured socializing in the other locations.

Only the respondents who participated in both waves were included in the analyses of the current study ($N = 615$). The two-wave sample consists of 52.6 percent boys and 47.4 percent girls. Ages range from 11 to 17 years in the first wave and from 13 to 20 years in the second wave, with a mean age of 14.3 years in the first and 16.5 years in the second wave. Of the respondents, 57.3 percent belong to the youngest cohort (the initial 1st graders) and 42.7 percent belong to the oldest cohort (the initial 4th graders). The data for both waves were collected over several months and, therefore, the time period between the waves is not exactly the same for every respondent. For almost all respondents (99.4 percent), the time lag between the two waves is between 1.6 and 2.6 years. Although the majority of the sample is of native Dutch descent, a relatively large portion of the sample comes from ethnic minorities (45 percent). Relatively many adolescents come from lower forms of secondary education; 17.9 percent of the respondents were recruited in schools offering 'practice education', the lowest level of secondary education, and 47.7 percent of the respondents were following preparatory education during the first wave of the study, which is the most common form of secondary education in the Netherlands. The remaining respondents were recruited at medium level schools (10.5 percent) or at the highest level of secondary education (23.8 percent). Because the sample was drawn from a non-random selection of schools in The Hague, it is not a representative sample of Dutch youth, but it is highly varied in terms of ethnicity, with a focus on lower educated youths from a highly urbanized region of the Netherlands.

Measures

Two research instruments from the SPAN study were used in the current study: A *questionnaire* and a *space-time budget interview*. Both instruments

are similar to the ones used in the Peterborough Adolescent and Young Adult Development Study conducted by Wikström et al. (Wikström and Butterworth, 2006; Wikström et al., 2010; Wikström et al., 2012a). These instruments were translated into Dutch and adapted slightly for the SPAN study.

The *questionnaire* was used to create an index of self-reported delinquency. Four respondents completed the questionnaire simultaneously. This took one school period of 45-50 minutes and was supervised by a research assistant.

The dependent variable of self-reported *total delinquency frequency* comprises 20 items from the questionnaire. The items indicate how often the respondent committed various types of offences in the preceding school year. Example items are 'stole something from a shop' and 'kicked or hit somebody who was injured as a result'. The alpha of the scale is .90 in the first wave and .85 in the second wave. The answering codes that were used for each item were 'never' (0), 'once' (1), 'twice' (2), 'three to five times' (3), 'six to ten times' (4) and 'more than ten times' (5).

The *space-time budget interview* asked the respondents about their hourly activities and whereabouts in the four days preceding the interview, including Friday, Saturday and the two most recent week days. For every hour, the respondents were asked about the nature of their main activity, the geographical location and the functional location (e.g., home, school, street) of this activity and who the respondent was with during the activity, specified as different members of 'family', 'peers' and 'other people'. The space-time budget interviews were conducted individually, in a face-to-face interview with each respondent. Although the space-time budget method is relatively new, time use research is a well-developed area in the social sciences (Harvey and Pentland, 1999; Wikström et al., 2012a).

To explore the validity of the measures on activities, we analyzed the correspondence between the hourly activities reported in the space-time budget interviews and the activity patterns reported in the questionnaires about the time spent on the street, in parks or in playing fields and the time spent with friends at youth centers and (sport) societies. Two checks for inconsistency between the questionnaire and the space-time budget interviews were conducted. We first studied the number of respondents who reported being involved '(almost) daily' in certain activities but did not report any hours involved in corresponding activities during the four space-time budget days. Of the respondents involved '(almost) daily' in

time spent with peers *on the streets and in parks*, 88 percent reported at least one hour involved in corresponding activities in the space-time budget interview in wave 1 and 87 percent reported at least one hour in wave 2. Of the respondents involved ‘(almost) daily’ in time spent with peers *at youth centers and societies*, 75 percent reported at least one hour of corresponding activities in the space-time budget interview of wave 1 and 87 percent reported at least one hour in wave 2. As a second check for inconsistency, we conducted Pearson correlations between the questionnaire and the space-time budget measures. Correlations between the measures expressing ‘time with peers on the streets and in parks’ were .435 in wave 1 and .428 in wave 2. Correlations between the measures expressing ‘time with peers at youth centers and societies’ were .377 for wave 1 and .439 for wave 2. Although the validity of space-time budget methods needs to be further explored, we felt that the correspondence between the questionnaire and space-time budget measures is sufficient, especially when taking into account the fact that the space-time budget interview records only four days and uses different units from those of the questionnaire.

The collected data were used to create variables regarding the amount of hours that the respondents had spent in *unstructured socializing* and regarding the *locations* in which they had spent these hours. Since we make the assumption that the activities during the space-time budget interviews represent respondents’ normal routines, non-typical days were excluded from the analysis. Days were classified as ‘non-typical’ when a respondent was ill that day or had a day off school.²³

Involvement in unstructured socializing is the total number of hours per individual (for all four days covered by the space-time budget interviews) spent in ‘unsupervised unstructured peer-oriented activity’. Detailed information about every hour in the space-time budget interview enabled us to accurately scrutinize whether each condition of ‘unstructured socializing’ was present. The variable ‘involvement in unstructured socializing’ incorporates only the hours in which one or more peers were present and in which no adult family member or other significant adult was present. Further, we included

²³ The exclusion of non-typical days is not expected to bias the results, because they are rare. During the first wave, 2.5 percent of the space-time budget days were non-typical. During the second wave, 3.6 percent of the space-time budget days were non-typical. To control for the exclusion of the non-typical days, we divided the sum score of the individuals by the number of hours that were included and then multiplied the score by 100.

only the hours in which a respondent was involved in unstructured activity, defined as ‘activities in which there are no rules or only (unwritten) rules that can be easily broken by every individual who is involved in the activity’ (for example, ‘hanging around’ or ‘walking around without a destination’). A list of all activities that are defined as ‘unstructured’ is included in Appendix A at the end of this book. We used a broad definition of ‘unstructured activity’ to avoid excluding activities that might be both structured and unstructured. For example, in a situation where a group of adolescents goes from one friend to another, ‘transport’ can function as an unstructured activity. As a robustness check, all analyses were also conducted with an unstructured socializing variable that was operationalized with a more narrow definition of ‘unstructured activity’ (only the activities of ‘hanging around’, ‘walking or biking around without a goal’, ‘socializing’, ‘talking’, ‘going out’, ‘socializing and having a drink’ and combinations of socializing). The analyses with this alternative unstructured socializing variable showed substantially similar results.

Several variables specify the locations in which unstructured socializing took place. A list of locations per category is presented in Appendix 5A at the end of this chapter. Unstructured socializing *in private spaces* is the total number of hours spent in unstructured socializing in locations that are primarily observed by those with personal responsibility, such as owners, family and friends (e.g., the respondent’s house or houses of friends). Unstructured socializing *in semi-public spaces* is the total number of hours spent in unstructured socializing in locations that are not private or public spaces. Semi-public spaces are divided into *public entertainment*, *public transportation* and *other semi-public settings* (such as school and clubs). Unstructured socializing *in public spaces* is the total number of hours spent in unstructured socializing in locations that are monitored solely by people with general responsibility. Public spaces are divided into *streets and squares*, *shopping centers* and *open spaces*.

Analytical strategy

To investigate the association between unstructured socializing, locations and adolescent delinquency, we used multilevel analyses to estimate *within-person* as well as *between-person* differences. The *within-person* analyses are used to

control for selection effects effects that occur when crime prone individuals prefer settings that do not require discipline or supervision to other settings. Within-person analyses investigate whether an increase in involvement in unstructured socializing (in different locations) over time for one person is associated with an increase in delinquency for the same person, regardless of his or her initial participation in unstructured socializing or delinquency and regardless of other relevant differences in (stable) person characteristics. In addition, the *between-person* analyses investigate whether person A, who is more involved in unstructured socializing (in different locations) than person B, is also more involved in delinquency than person B.

Since our data includes two observations per respondent (two observations within person over time), we estimated a random *intercept* model instead of a random *slope* model.²⁴ We added two parameters to the random intercept model for each independent variable: A between-person parameter and a within-person parameter. The between-person parameter is computed by averaging the scores on the independent variables across both observations for each respondent. The within-person parameter is computed by subtracting the between-person score from the score on each observation.

The random intercept models were executed by employing negative binomial regression, since the dependent variable ‘delinquency’ is highly positively skewed and violates basic assumptions of OLS regression.²⁵ No transformations were made to the dependent or independent variables. Multicollinearity diagnostic tests were performed on cross-sectional versions of each model by estimating variation inflation factors (VIF). None of the VIF values was higher than 1.16, indicating that no model is characterized by multicollinearity. Wald tests were applied to examine differences between the parameters in the models. ‘Age’ was included in the model as a control,

24 With only two observations per respondent, it is not possible to separately identify random slope variance from residual variance, as conducted in a random slope model. It is, however, possible to conduct random intercept models. Even though two-wave panel analyses are somewhat restricted compared with three-wave (or more) panel analyses, they still enable the researcher to separate the between-person effects from the within-person effects because they enable the study of *change* within a person. Cross-sectional analyses are useful for studying the between-person effects but not for studying within-person effects.

25 We did not use Tobit regression, even though Osgood, Finken, and McMorris (2002) argue in favor of Tobit since they consider ‘delinquency’ to be a variable censored at zero. The reason for choosing negative binomial over Tobit regression was that multilevel regression is not possible with Tobit regression, whereas it is possible with negative binomial regression. As a robustness check, we conducted cross-sectional analyses with both Tobit and negative binomial models. The results were very similar.

because it is known to be related to both delinquency (e.g., Hirschi and Gottfredson, 1983) and involvement in unstructured socializing (e.g., Osgood et al., 1996).²⁶

Findings

Table 5.1 offers descriptive information about delinquency, involvement in unstructured socializing and the locations where unstructured socializing takes place. The findings show that a majority of the respondents were involved in at least one offence during the preceding school year (approximately 70 percent) and at least one hour of unstructured socializing during the four space-time budget days (approximately 80 percent). The mean number of hours spent on unstructured socializing per individual during the four days of the space-time budget interview (96 hours in total) is approximately 5.3 for the first wave and approximately 6.0 for the second wave. Unstructured socializing occurs most often in public spaces (2.8 hours in wave 1 and 2.1 hours in wave 2) and least often in private spaces (.7 hours in wave 1 and 1.6 hours in wave 2). From the three categories of semi-public spaces, unstructured socializing occurs for most of the hours in public transportation in wave 1 (0.8 hours) and in public entertainment in wave 2 (1.3 hours). Among the three categories of public spaces, unstructured socializing occurs for most hours on the street (1.77 and 1.26 hours in waves 1 and 2, respectively).

26 The well-known age-crime curve predicts a positive effect of age on delinquency before the age of approximately 16 and a negative effect of age on delinquency afterwards (Hirschi and Gottfredson, 1983). To control for this curvilinear relationship, we added three variables to the model: Age, expressing the effect of age on delinquency over time; an age dummy, expressing whether a respondent was 14 years or younger at the first observation (0: ≥ 14 ; 1: ≤ 14); and an interaction term of 'age' and 'age dummy', expressing whether the age effect on delinquency differs for the two age cohorts (the youngest cohort was 14 or younger during the first observation and the oldest cohort was older than 14 during the first observation). Findings indicate a negative age effect on delinquency for the oldest cohort and no age effect on delinquency for the youngest cohort. Given the ample time lag between the two waves, we consider our data insufficient for studying the complete age-crime curve and we therefore consider further questions regarding the role of age beyond the scope of our research.

Table 5.1. Descriptive statistics of delinquency, unstructured socializing and the locations where unstructured socializing occurs

	Percentage of individuals involved in delinquency and unstructured socializing (N = 615)		Wave 1		Wave 2		Mean score on delinquency Mean number of hours involved in unstructured socializing per individual (N = 96 per individual)		Wave 1		Wave 2		Wilcoxon signed rank test Z
	Wave 1	Wave 2	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	
Delinquency	71.5	64.9	5.958	(9.452)	4.810	(7.929)							-3.254**
Unstructured socializing	78.5	78.0	5.300	(6.036)	6.061	(6.533)							2.583*
Private space	19.2	35.4	.712	(1.997)	1.587	(3.221)							7.015**
Semi-public space	49.6	52.0	1.751	(2.579)	2.318	(3.514)							2.958**
Public entertainment	16.4	28.8	.557	(1.609)	1.309	(2.899)							6.228**
Public transportation	29.3	28.0	.781	(1.531)	.711	(1.437)							-.964
Other semi-public	19.5	13.5	.413	(1.161)	.298	(1.093)							-2.186*
Public space	61.3	57.9	2.820	(4.220)	2.134	(3.259)							-3.799**
Streets	44.6	40.3	1.768	(3.372)	1.255	(2.506)							-3.744**
Shopping center	16.4	22.0	.395	(1.135)	.595	(1.478)							2.981**
Open spaces	18.9	11.5	.656	(1.906)	.284	(1.133)							-4.276**

ABBREVIATION: SD = standard deviation.

*p < .05; **p < .01 (two-tailed).

Involvement in delinquency decreased from wave 1 to wave 2, whereas involvement in unstructured socializing increased. The increase in involvement in unstructured socializing is location specific: Unstructured socializing in private spaces, public entertainment and shopping centers increases, whereas unstructured socializing in other locations decreases or remains the same. These findings indicate that there are age specific preferences for the locations where adolescents meet their peers.

Unstructured socializing, location and delinquency

Table 5.2 shows the results of three random intercept models. To simplify interpretation of the findings, we report the incidence rate ratios (IRRs) instead of the regular coefficients²⁷. Model 1 in Table 5.2 shows the relationship between involvement in unstructured socializing and delinquency. Model 2 and 3 specify this relationship for the locations where unstructured socializing takes place. In Model 2, the involvement in unstructured socializing is specified for the three main categories: Private, semi-public and public spaces. Model 3 further categorizes the semi-public spaces into public entertainment, public transportation and other semi-public spaces, and the public spaces into streets, shopping centers and open spaces.

Model 1 incorporates the effect of involvement in unstructured socializing, which appears to be significant for both the within-person and the between-person variable. The within-person effect can be interpreted as follows: An increase of *one hour* in involvement in unstructured socializing between the two waves is associated with an increase of approximately 2.7 percent in the delinquency variable *for the same person* (IRR = 1.027, $p < .01$). The between-person effect can be interpreted as follows: The score on delinquency is approximately 10 percent higher for person A, who is on average *one hour* more involved in unstructured socializing compared with person B (IRR = 1.100, $p < .01$). It is important to note that these percentages express changes in delinquency for each *extra hour* of unstructured socializing, which implies that the total effects may be stronger than they seem. To illustrate this: An increase of *two* hours in unstructured socializing

²⁷ IRRs report the exponentiated coefficients (e^b) instead of the regular coefficient b . In negative binomial models, exponentiated coefficients have the same interpretation as IRRs. The regular coefficient is calculated with $\ln(\text{IRR})$.

is associated with an increase of (2×2.7) 5.4 percent in delinquency *within* a person and with an increase of (2×10) 20 percent in delinquency *between* persons. The *between-person* effect is clearly bigger than the *within-person* effect. This finding implies that underlying factors (individual characteristics that differ between persons) explain the bigger part of the relationship between unstructured socializing and delinquency, but that the relation still remains when controlled for these factors.

Table 5.2. Delinquency regressed on overall unstructured socializing and on unstructured socializing specified for location ($N_{\max} = 615$)

	Model 1		Model 2		Model 3	
	IRR	(SE)	IRR	(SE)	IRR	(SE)
Within-person effects						
Unstructured socializing	1.027**	(.006)				
Private space			.988	(.013)	.986	(.013)
Semi-public space			1.030*	(.012)		
Public entertainment					1.036*	(.015)
Public transportation					1.038	(.025)
Other semi-public					.998	(.032)
Public space			1.045**	(.009)		
Streets					1.051**	(.012)
Shopping center					1.000	(.031)
Open spaces					1.050*	(.020)
Between-person effects						
Unstructured socializing	1.100**	(.008)				
Private space			1.137**	(.020)	1.138**	(.021)
Semi-public space			1.077**	(.017)		
Public entertainment					1.051*	(.023)
Public transportation					1.144**	(.038)
Other semi-public					1.110*	(.048)
Public space			1.096**	(.014)		
Streets					1.096**	(.017)
Shopping center					.998	(.040)
Open spaces					1.169**	(.037)
Age	.809**	(.028)	.835**	(.031)	.843**	(.032)
Age dummy (youngest cohort = 1)	.031**	(.023)	.043**	(.033)	.037**	(.029)
Age* Age dummy	1.257**	(.060)	1.237**	(.061)	1.247**	(.061)
Constant	16.395**	(10.104)	9.661**	(6.318)	8.441**	(5.521)

NOTES: Results from random intercept two-level negative binomial models.

ABBREVIATIONS: SE = standard error; IRR = incidence rate ratio.

* $p < .05$; ** $p < .01$ (two-tailed).

The results of Model 2 indicate that the *within-person effects* of unstructured socializing on delinquency do not apply for all locations. More specifically: Changes in involvement in unstructured socializing between the two waves are associated with changes in delinquency only when unstructured socializing takes place in public spaces and, to a lesser extent, in semi-public spaces. Unstructured socializing in public spaces accounts for a 4.5 percent increase in the delinquency variable ($IRR = 1.045, p < .01$) and unstructured socializing in semi-public spaces accounts for a 3.0 percent increase in the delinquency variable ($IRR = 1.030, p < .05$). As in the previous model, it is important to note that these effects express changes in delinquency for each extra *hour* unstructured socializing. Results of Wald tests indicate that the association between delinquency and unstructured socializing in private spaces is significantly weaker than the association between delinquency and unstructured socializing in semi-public spaces ($\chi^2 = 5.06, p < .05$) and public spaces ($\chi^2 = 10.88, p < .01$). The associations between delinquency and unstructured socializing in public and semi-public spaces do not differ significantly ($\chi^2 = .92, p > .05$).

The results of Model 2 indicate that the *between-person effects* of unstructured socializing on delinquency apply for all locations. Findings from Wald tests indicate that the association of delinquency with unstructured socializing in private spaces is stronger than the association of delinquency with unstructured socializing in semi-public spaces ($\chi^2 = 4.20, p < .05$). The other *between-person* associations in Model 2 do not differ significantly from each other (private-public: $\chi^2 = 2.29, p > .05$; semi-public-public: $\chi^2 = .66, p > .05$). These findings imply that individuals who are more involved in unstructured socializing are more likely to participate in delinquency than individuals who are less involved in unstructured socializing, regardless of the location where the unstructured socializing takes place. Nevertheless, once the relationship is controlled for individual characteristics that might influence both involvement in unstructured socializing and delinquency, only the effect of unstructured socializing in public and semi-public spaces remains.

Model 3 represents a more detailed analysis of unstructured socializing in six categories of semi-public and public spaces. The results of this model indicate that an increase of one hour in involvement in unstructured socializing between the two waves is associated with an increase in the delinquency variable only when these hours of unstructured socializing

take place in public entertainment, on the street or in open spaces. It then accounts *per extra hour* of unstructured socializing for increases of 3.6 percent, 5.1 percent and 5.0 percent, respectively, in the delinquency variable (public entertainment: IRR = 1.036, $p < .05$; streets: IRR = 1.051, $p < .01$; open spaces: IRR = 1.050, $p < .05$). However, findings from Wald tests indicate no significant differences in the associations between delinquency and unstructured socializing in the six categories (χ^2 's vary from .00 to 2.49, no significance level is smaller than .115). The *between-person* effects on delinquency apply for unstructured socializing in all six categories of semi-public and public spaces except for shopping centers. Findings from the Wald tests indicate that the association between delinquency and unstructured socializing is significantly weaker in public entertainment settings compared with public transportation ($\chi^2 = 4.35$, $p < .05$) and open spaces ($\chi^2 = 7.28$, $p < .01$). The association between delinquency and unstructured socializing in shopping centers is significantly weaker compared with open spaces ($\chi^2 = 9.71$, $p < .01$), public transportation ($\chi^2 = 5.70$, $p < .05$) and streets ($\chi^2 = 4.65$, $p < .05$). The other between-person associations in Model 3 do not differ significantly from each other (χ^2 's vary from .07 to 3.29, no significance level is smaller than .070).

Discussion and conclusion

The main aim of the current study was to identify in what locations unstructured socializing is, and is not, related to individual involvement in delinquency. We built on a body of research suggesting that involvement in unstructured socializing is strongly related to adolescent delinquency (Anderson and Hughes, 2009; Haynie and Osgood, 2005; Osgood and Anderson, 2004; Osgood et al., 1996; Vazsonyi et al., 2002). We further hypothesized that the crime conduciveness of a location resides in the extent of responsibility for that location, based on Felson's (1995) distinction between personal responsibility, assigned responsibility, diffuse job responsibility and general responsibility for private, semi-private, semi-public and public spaces, respectively. We used detailed data, derived from space-time budget interviews among 615 respondents in The Hague, the Netherlands, about the hourly activities and whereabouts of adolescents.

Overall, three important findings emerged. First, a majority of the respondents in this study are involved in unstructured socializing. Nearly 80 percent of the respondents participated for at least one hour in these activities during the four days covered by the space-time budget interview. Second, involvement in unstructured socializing is positively associated with delinquency. The association remains when controlled for stable individual characteristics. This is in line with our first hypothesis based on previous studies, in particular on the work from Osgood et al. (1996). Third, the location where adolescents spent their time in unstructured socializing specifies the relationship between unstructured socializing and delinquency. Unstructured socializing in semi-public and public spaces is related more strongly to delinquency than unstructured socializing in private spaces. This is in line with our Hypothesis 2A, which was based on Felson's approach to responsibilities of spaces (Felson, 1995). In contrast to our Hypothesis 2B, unstructured socializing in public spaces is not related more strongly to delinquency than unstructured socializing in semi-public spaces. Hypotheses 2C and 2D state, respectively, that unstructured socializing in public entertainment settings and public transportation is more strongly related to delinquency than unstructured socializing in other semi-public spaces and that unstructured socializing in open spaces is more strongly related to delinquency than unstructured socializing in streets or shopping centers. Once controlled for stable individual differences, unstructured socializing is significantly related to delinquency only when it occurs in public entertainment settings, on the streets and in open spaces. This is in line with Hypothesis 2C and partly in line with Hypothesis 2D (unstructured socializing in open spaces and on the streets seems similarly strongly related to delinquency). However, the findings of the Wald tests did not show significant differences between the categories. This is not in line with Hypotheses 2C and 2D.

The current study has a few limitations that should be mentioned. The first and most basic limitation is that the space-time budget interviews, from which our independent variables are derived, cover only four days in the week preceding the interview. The assumption that those days are representative of the entire year leaves room for measurement error. Most evident is the possibility of seasonal influences. It is likely that respondents' activity patterns vary with the weather, especially when these activities occur outside. The

first wave of the data collection took place between October until March and covered autumn, winter and spring. The second wave took place between November and June and therefore covered winter, spring and the start of summer. Although the four days limit the representation of daily activities, the space-time budget method seems to have less risk of retrospective bias than asking respondents 'how many hours in the past week were spent in certain activities', as previous studies did (Anderson and Hughes, 2009; Haynie and Osgood, 2005; Maimon and Browning, 2010; Osgood and Anderson, 2004; Osgood et al., 1996). In addition, we use the space-time budget method mainly to test etiological theories and not to describe (inter) national activity patterns among adolescents. A possible second limitation of the study is that some of the respondents from the first wave did not participate in the second wave (27 percent). The dropouts were generally older than the participants and differed from them with regard to unstructured socializing, but no selection bias was found for self-reported delinquency. We have no reasons to believe that this somewhat selective dropout biased our results, other than providing a relatively conservative test of the effect of unstructured socializing on delinquency. A third limitation is that, although we based our classification of locations on Felson's approach, we did not directly analyze the assumed mechanisms underlying the location-delinquency association. We therefore do not know to what extent this offers a valid explanation for the relationship. Other explanations are possible: Miller (2013) argues that the level of criminality of activity settings is determined by the presence of targets and facilitators. Situational action theory argues that the causal mechanisms of a setting relevant to engagement in crime are temptations, provocations and deterrence (Wikström, 2004; 2005).

Despite these limitations, our findings strongly suggest that the association between exposure to unstructured socializing and involvement in delinquency depends on the location in which unstructured socializing occurs. The current study, therefore, indicates that the unstructured socializing perspective of Osgood et al. (1996) may be extended with a fourth condition: Whether an activity occurs in a semi-public or public space and, more specifically, whether it occurs in public entertainment settings, on the street or in open spaces. More research is necessary to support this extension.

Our findings may lead to other research questions as well. First, it would be interesting to study the role of social disorganization and disorder

within neighborhoods, because the current study indicates strong effects of unstructured socializing on the street and in open spaces. This area is not undeveloped. For example, Maimon and Browning (2010) have already made an effort to integrate social disorganization theory with the unstructured socializing perspective. Second, future studies could clarify which characteristics affect adolescents' exposure to unstructured socializing (in different functional locations) and to what extent peer pressures play a role in this regard. Our findings indicate that adolescents who are more often involved in unstructured socializing are more likely to be involved in delinquency and that between-person differences explain the bigger part of this relation. These findings imply the presence of selection effects. A third issue that needs to be addressed in the future is that of the interaction effects between individual characteristics and exposure to unstructured socializing in different functional spaces. Situational action theory (Wikström, 2004; 2005) posits that some individuals are more vulnerable than others to exposure to certain settings because of morality and self-control. The effect of unstructured socializing in, for example, open spaces, may therefore be more problematic for adolescents with low self-control than for adolescents with high self-control. Fourth, future studies could further elaborate the set of relevant conditions under which time spent with peers is related to adolescent delinquency. Fifth, future studies could clarify the mechanisms through which peers and these locations interact in their influence on adolescents' delinquency.

Studies on unstructured socializing contribute to our knowledge about adolescents' exposure to criminogenic settings and they improve our understanding about peer processes in their relationship to adolescent delinquency. The idea that solely 'time spent with peers' may lead to adolescent delinquency is clearly out of date. The effect of time spent with peers is dependent on the conditions under which it occurs, as confirmed in several prior studies (for example, Weerman et al., 2013). The current study adds another situational condition to the list of criminogenic conditions defined by unstructured socializing, namely, the location where these activities take place.

Appendix 5A

Table 5A.1. Classification of locations

Functional location	Code labels in space-time budget interviews
Private	Home, alternative home (e.g., other parent's home), others' home, other (garden of a house), moving around: by car, workplace: babysit (other person's house).
Semi-public	Entertainment and recreation facilities
	Entertainment (general code), games arcades (e.g. laser games, go-kart), theatre, cinema, pub/bar, disco/club, restaurant/café, theme park/fairground, youth club/community center, library, festival grounds/party hall, indoor swimming pool, museum, billiard or snooker club, snack bar, coffee shop (café where one can buy soft drugs), takeaway (e.g. McDonalds/Burger King/ KFC), videotheque, indoor ski track, ice rink, outdoor swimming pool, swimming pool, bowling alley, skate park.
	Public transportation
	Moving around: by bus, moving around: by train, moving around: by underground, railway station, airport.
	Semi-public other
	School (general code), classroom, other place in school buildings (e.g., corridors, dinner hall), outdoors school grounds (e.g., school field, including during sports lesson), homework institute, other school or outdoor school grounds of other school, canteen of a society, sport (general code), football ground, rugby ground, cricket ground, athletics ground, snooker club, golf course, sports center: volleyball/handball/ basketball, hockey pitch, tennis courts, gymnastic club, fitness center (fitness and aerobic), other sports or leisure club, riding school, church/mosque/religious center, school of music, dancing school, hospital, doctor, dentist, hairdresser, beauty salon, hotel, caravan site/holiday apartment, other (e.g., parent's office), psychologist/therapist/psychiatrist, moving around: by airplane, petrol station/garage, supermarket/store, workplace (general code), workplace: building site, workplace: nursing home, workplace: children's playgroup/nursery, workplace: children's playgroup/nursery, workplace: office, workplace: hairdresser/beauty salon, workplace: shop, workplace: pub, workplace: restaurant/café, workplace: garage, workplace: factory, workplace: agriculture/greenhouses, workplace: snack bar, workplace: petrol station, workplace: takeaway, other workplaces.
Public	Streets and squares
	Streets, squares and places (general code), streets/street corner, square, moving around (general code), moving around: by foot, moving around: by bike, moving around: by moped/ motorcycle/scooter, boulevard, bus station/stop.
	Shopping center
	Shops/shopping arcades/shopping centers (general code), The Hague shopping center (city center), shopping center elsewhere, market, megastores The Hague.
	Open spaces
	Car park, industrial estate, cross field (bike/moped), street football ground, street basketball ground, playing field, lawn, playground, parks, beach, lake, forests, sea, dunes.



Chapter Six.

Disadvantage in the Area

Hoeben, Evelien M. 2016. Beyond the borders of the residential neighborhood:
Unstructured socializing, neighborhood disadvantage, and adolescent delinquency.
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Disadvantage in the Area

Actions are always actions in landscapes – Jakob Meløe

An extensive body of research considers neighborhood or community influences on adolescents' involvement in delinquency (see overviews by Foster and Brooks-Gunn, 2013; Sampson, Morenoff, and Gannon-Rowley, 2002; empirical evidence for the relationship is reported by, for example, Haynie, Silver, and Teasdale, 2006; Oberwittler, 2004; Simons et al., 2005). Most of these studies focused on the *residential* neighborhood, even though daily activity patterns of adolescents cover a geographical area far beyond the borders of their residential neighborhoods (Basta, Richmond, and Wiebe, 2010; Bichler, Christie-Merrall, and Sechrest, 2011; Wiehe et al., 2008b; Wikström et al., 2012a). Therefore, not surprisingly, increasing attention has been paid to the need to incorporate individuals' activity patterns, or *activity spaces* in research on environmental influences (Browning and Soller, 2014; Graif, Gladfelter, and Matthews, 2014; Kwan, 2012; Matthews and Yang, 2013; Wikström et al., 2012a). One activity pattern that has consistently shown to be related to adolescent delinquency is involvement in unstructured socializing: A situation where peers are present, authority figures are absent and in which there is a lack of structured activity (Osgood et al., 1996). It is, therefore, particularly interesting to study the influences of neighborhoods where adolescents spend their time in unstructured socializing (Simons et al., 2014; Wikström et al., 2012a).

The aim of the current study is to disentangle the interrelations between characteristics of the *residential neighborhood*, characteristics of the *neighborhoods where adolescents spent time in unstructured socializing*, and adolescent delinquency. To pursue this aim, the study addresses three research questions. First, the study examines where adolescents spend their time in unstructured socializing: How far away from their homes the socializing occurs and in what types of neighborhoods, i.e., how disorderly

and disorganized those neighborhoods are, as an exploration into adolescents' exposure to influences from neighborhoods other than their residential neighborhood. Second, the study examines whether characteristics of the neighborhoods where adolescents spend time in unstructured socializing affect the relationship between unstructured socializing and delinquency. Third, the study examines whether characteristics of the residential neighborhood affect adolescents' involvement in delinquency directly and indirectly through exposure to settings of unstructured socializing in disorganized and disordered neighborhoods. Theoretically, the study builds on Barkers' (1963; 1968) concept of behavior settings by integrating the routine activity theory of general deviance (Osgood et al., 1996) with social disorganization theory (Sampson, Raudenbush, and Earls, 1997; Shaw and McKay, 1942) and broken window theory (Kelling and Coles, 1996; Wilson and Kelling, 1982).

The study employs innovative methods for data collection and combines space-time budget data about the locations where adolescents spend their time in unstructured socializing with information on neighborhood characteristics derived from systematic social observations, community surveys, and census data. All data sources were collected in the Study of Peers, Activities and Neighborhoods (SPAN). The study applied data on 387 adolescents (aged 11 to 20 years) who resided, at the time of the interview, in the city of The Hague (the Netherlands).

Where do adolescents spend their time?

From the scarce studies that have been conducted on this topic, we know that adolescents spend a great deal of their time outside of their residential neighborhoods or direct home environments. For example, Basta, Richmond, and Wiehe (2010) found in a study among 55 adolescent males that on average 6.3 hours per day were spent outside of the residential census tract. Wiehe and colleagues (Wiehe et al., 2008a; Wiehe et al., 2008b) noted that their respondents (15 adolescent females) spent on average 25 percent of their time more than one kilometer from home excluding time at school (a one kilometer radius around the home was considered to be a threshold for the residential area). Bichler, Christie-Merrall, and Sechrest (2011) investigated

the activity patterns of approximately 2600 delinquent youths and found that they typically travelled about 1.5 miles (2.4 km) to their primary hangout locations and even further away to other locations, such as their schools or the mall. Wikström and colleagues (Wikström et al., 2010; Wikström et al., 2012a) reported that their respondents (approximately 700 adolescents) spent more than 50 percent of their time awake outside of the direct home environment and that 90 percent of all reported crimes occurred while the respondents were away from the direct home environment.

These studies illustrate that adolescents' daily behaviors take them to neighborhoods other than their residential neighborhoods and thus expose them to environmental influences that may be different than those provided by their residential neighborhoods. This implies that if we want to understand the impact of neighborhood characteristics on adolescent delinquency, we need to expand our view beyond the residential neighborhood and incorporate all neighborhoods that adolescents are exposed to over the course of the day (see also the arguments made by Kwan, 2012, and Matthews and Yang, 2013). A focus on routine activities (Cohen and Felson, 1979; Felson and Boba, 2010) is necessary in this regard since routine activities determine the locations where individuals spend their time and thus the neighborhoods they are exposed to (Brantingham and Brantingham, 1993). A specific routine activity that has been related to individual adolescent delinquency is involvement in unstructured socializing (Osgood et al., 1996).

Unstructured socializing refers to activities characterized by three features: 1) The activities are unstructured; 2) the activities occur together with peers; and 3) there are no authority figures present. Osgood et al. (1996) coined the term unstructured socializing to specify activities that expose individuals to increased risks for engaging in deviant behavior. They argued that a lack of structure in (leisure) activities leaves time, and thus opportunity, available for deviance. The presence of peers potentially brings about social rewards for deviance because peers can serve as an appreciative audience and thus provide "rewards of enhanced status and reputation" (Osgood et al., 1996: 639, see also Briar and Piliavin, 1965, and Warr, 2002). Absence of authority figures implies a lack of social control and thus a decreased risk of negative consequences of deviant behavior (a reduced risk for 'getting caught' or being frowned upon). Findings of the study of Osgood et al. (1996) indicated that within-individual changes in participation in such activities

(e.g., informally getting together with friends, spending evenings out for fun) were associated with involvement in a variety of deviant behaviors: Criminal behavior, alcohol use, drug use, and dangerous driving. Since Osgood et al.'s publication in 1996, several other empirical studies have found support for the relationship between unstructured socializing and adolescent delinquency (e.g., Bernasco et al., 2013b; Haynie and Osgood, 2005; Maimon and Browning, 2010; Osgood and Anderson, 2004; Vazsonyi et al., 2002).

Integrating routine activities, social disorganization, and broken windows

A focus on the neighborhoods where individuals spend their time in unstructured socializing, rather than on residential neighborhoods, requires an extended theoretical framework. We can no longer lean on long-term explanations about socialization or segregation (see Gephart, 1997 for an overview of potential explanations) because the influences of neighborhoods where time is spent will mainly operate situational and short-term. The current study proposes an integration of the unstructured socializing approach with social disorganization theory and broken windows theory, within a broader theoretical framework offered by Barkers' (1963; 1968) behavior setting theory.

Behavior setting theory emphasizes that behavior can only be understood in the context in which it occurs (Barker, 1987). Behavior settings are slices in time and space (e.g., English class on Tuesday morning), consisting of both physical elements (e.g., the classroom, the chairs, the blackboard) and social elements (e.g., the teacher and students). The physical elements facilitate and shape the behavior that occurs in the setting (e.g., students' chairs face the blackboard). The defining features of a behavior setting are the *standing patterns of behavior*. These patterns dictate the behavior of individuals within the setting. In the classroom, for example, standing patterns of behavior are teaching and listening (Barker, 1963; Barker, 1968; Barker et al., 1978) . The remainder of this section will discuss how standing patterns of behavior in disordered and disorganized neighborhoods may affect the behavior of adolescents spending time in unstructured socializing in those neighborhoods.

Social disorganization

Social disorganization is the “decay of existing social rules of behavior and institutions” (Thomas and Znaniecki, 1918-1920: 165), or in a more recent definition, “the inability of a community structure to realize the common values of its residents and maintain effective social controls” (Sampson and Groves, 1989: 777). Proposed indicators of social disorganization are low socioeconomic status, high ethnic heterogeneity, high residential mobility (Shaw and McKay, 1942), family disruption (Sampson, 1987), population density, structural density (Sampson and Groves, 1989), and collective efficacy (Sampson, Raudenbush, and Earls, 1997). All these indicators have been theorized to affect informal social control and supervision: The more disorganization in the neighborhood, the less supervision and control is exerted over residents and visitors in those neighborhoods. Following behavior setting theory, social disorganization in a neighborhood can be perceived as a ‘standing behavior pattern’ in which residents will not interfere if someone violates rules. This standing behavior pattern is relevant to adolescents engaged in unstructured socializing, because more disorganization also means less supervision and control over groups of loitering teenagers (e.g., Sampson and Groves, 1989): Adolescents are less likely to be caught in these neighborhoods, or to be sent away because they cause nuisances. Adolescents who spend time in unstructured socializing in organized neighborhoods may, therefore, feel that *other behavior of them is expected* than adolescents who hang out in disorganized neighborhoods (see also arguments made by Wikström and Loeber, 2000, Wikström et al., 2010, and Simons et al., 2014). The presence of standing behavior patterns in which residents will not interfere in rule violation, and thus a lack of deterrence, makes it more likely that unstructured socializing in disorganized neighborhoods will result in delinquency, hence the following hypothesis:

H1: Unstructured socializing is more strongly positively related to adolescent delinquency if it occurs in neighborhoods characterized by high levels of disorganization than if it occurs in neighborhoods characterized by low levels of disorganization.

Physical disorder

According to broken windows theory, signs of disorder communicate to both residents and visitors of a location that “no one cares” (Wilson and Kelling, 1982: 4): That rule breaking behaviors are not adequately tackled in that area and that offenders will probably not have to face negative consequences for their acts²⁸. Thus, signs of disorder, such as graffiti, broken bottles, or larger pieces of garbage that are spread out on the street, provide the descriptive norm that littering and other inappropriate behavior is common in that area. These signs can be perceived as *cues* of standing behavior patterns. Such cues have been theorized to weaken the concern for appropriateness of people visiting that area and to induce more inappropriate behavior (Keizer, Lindenberg, and Steg, 2008). This may also apply to adolescents who are spending time in unstructured socializing in those areas, leading to the following hypothesis:

H2: Unstructured socializing is more strongly positively related to adolescent delinquency if it occurs in neighborhoods characterized by high levels of physical disorder than if it occurs in neighborhoods characterized by low levels of physical disorder.

Constraints residential neighborhoods put on routine activity patterns

In disentangling the effects of neighborhoods where adolescents reside from the effects of neighborhoods where adolescents spend their time, it is important to also consider the extent to which residential neighborhoods shape adolescents' activity patterns. It has been theorized that the features in the residential neighborhood shape (spatial) activity patterns and thus affect individuals' exposure to environmental influences both inside and outside of the residential neighborhood (e.g., Browning and Soller, 2014; Wikström and Sampson, 2003).

²⁸ Broken window theory is more extensive and explains how, through a breakdown of informal social controls, small signs of disorder may accumulate over time by attracting or encouraging rule breaking behavior and thus emphasizes the relevance of maintaining public order (Kelling and Wilson, 2006; Skogan, 1990; Skogan, 2015; Wilson and Kelling, 1982).

In the allocation of time over activities, individuals are constrained by spatial distance. They can allocate more time to an activity by reducing traveling time to the location where the activity takes place (Hägerstrand, 1970). Individuals will, therefore, attempt to fulfill their needs close to home. It has been theorized that, if neighborhoods do not provide opportunities for structured leisure activities, individuals may be more likely to spend time in unstructured ways, which may explain their involvement in delinquency (e.g., Peterson, Krivo, and Harris, 2000; Sampson, Morenoff, and Gannon-Rowley, 2002). Similarly, adolescents from disadvantaged neighborhoods will be more likely to spend their time, in unstructured socializing or other activities, in disadvantaged areas because those areas will be closer to home. In line with this idea, Krivo et al. (2013) found that disadvantage in the residential area was predictive of disadvantage in the areas where residents perform their daily activities (see also Simons et al., 2014). Wikström et al. (2012a) found that adolescents spent most of their 'unstructured peer-oriented time' in areas with levels of collective efficacy similar to that in the home area, although the distribution was skewed: Adolescents from 'good' neighborhoods also spent more time in unstructured peer-oriented activities in areas with low collective efficacy.

In summary, because residential neighborhoods provide constraints on how and where adolescents spend their time, it is hypothesized that characteristics of the residential neighborhood will affect adolescents' exposure to unstructured socializing at disorganized and disordered locations and thus their exposure to certain behavior settings (Wikström and Loeber, 2000). This exposure may indirectly affect their involvement in delinquency (Wikström et al. 2012a).

H3: Disorganization and disorder in the residential neighborhood influences adolescents' involvement in unstructured socializing in disorganized and disordered neighborhoods, which in turn will affect their involvement in delinquency.

Current study

The current study is aimed at disentangling the interrelations between characteristics of the neighborhoods where adolescents reside, characteristics of the neighborhoods where they spend time in unstructured socializing, and their involvement in delinquency. Not many studies have been able to investigate influences of neighborhoods other than the residential neighborhood on individual behavior, which has been acknowledged as an important gap in the literature (Browning and Soller, 2014; Graif, Gladfelter, and Matthews, 2014; Kwan, 2012; Matthews and Yang, 2013). Further, and relatedly, the current study is one of the first to integrate the unstructured socializing perspective with social disorganization theory by addressing the areas where unstructured socializing *takes place*; previous studies have generally focused on characteristics of residential neighborhoods. For example, Maimon and Browning (2010) found that the positive unstructured socializing-delinquency relationship was strengthened by low levels of collective efficacy in the residential neighborhood, and Bernburg and Thorlindsson (2007) found that the relationship was strengthened by high levels of residential mobility and family disruption in the residential neighborhood. The only study that examined the extent to which disadvantage in the neighborhoods where adolescents spend their time in unstructured socializing affected their risk on delinquency was the study of Wikström et al. (2010): They reported positive correlations between respondents' self-reported crimes and the extent to which they were unsupervised with peers in areas of poor collective efficacy.

Data and methods

Data for this study were collected in the city of The Hague, the Netherlands, as part of the NSCR SPAN project. The respondents in the study are adolescents (aged 11 to 20 years) who resided in the municipality of The Hague at the time of the data collection. They were approached through their secondary school: All first graders (aged 12 to 13 years) and fourth graders (aged 15 to 16 years) of ten secondary schools were asked to join the study. For more information on the sampling process, see Chapter 1, Bernasco et al. (2013b)

or Weerman et al. (2013).

The total SPAN sample incorporated 843 adolescents in the first wave (2008-2009) and 615 adolescents in the second wave (2010-2011), of whom 642 and 458 adolescents, respectively, were part of the target population for the current study: They resided in the municipality of The Hague. This target population was chosen out of practical considerations because most neighborhood information was only available for the municipality of The Hague. Information on the central SPAN respondents was gathered with two measurement instruments: A space-time budget interview (similar to a time diary including information about respondents' whereabouts) and a questionnaire. Both instruments were similar to the ones used in the PADS+ study (Wikström and Butterworth, 2006; Wikström et al., 2010; Wikström et al., 2012a). Some respondents of the target population had to be excluded because information was missing on key variables. A conservative approach was applied, in which respondents were excluded when information was missing for one or more hours in the space-time budget interview, on activity, presence of peers or adults, or the location where the activity took place (functional and geographical). Respondents were also excluded if they participated in one wave of the data collection. The remaining sample consisted of 387 respondents who were slightly younger and lived in neighborhoods with a higher home address density than the full SPAN sample. They did not differ in reported delinquency, unstructured socializing, parental monitoring, delinquent peers, or self-control.

The final sample, 387 respondents, was on average 14.4 years old in the first wave and 16.5 years old in the second. The sample was roughly evenly split on gender (44 percent female) and somewhat overrepresented for respondents from ethnic minority backgrounds (50.9 percent from an ethnic minority group). Most respondents had a highly urbanized background: 88.4 percent lived in 'very strongly urban' neighborhoods (≥ 2500 addresses per km^2), 8.8 percent in 'strongly urban' neighborhoods (1500-2500 addresses per km^2), following the classification of Statistics Netherlands. The residential neighborhoods of respondents (boundaries as defined by Statistics Netherlands in 2008) were determined after the data collection, based on their house addresses or the geo-coded location that belonged to the place code 'home' in the space-time budget interviews. The 387 respondents resided in 83 neighborhoods at the time of the first

interview and in 84 neighborhoods at the time of the second; 41 respondents had moved between the interviews. A neighborhood accommodated on average 4.6 respondents, with a standard deviation of 3.6. The respondents spent 2138 hours in unstructured socializing in 118 different neighborhoods at the time of the first interview, and 1759 hours in unstructured socializing in 135 different neighborhoods at the time of the second interview.

Individual level measures

The dependent variable *individual delinquency* was an index of the respondents' self-reported delinquency frequencies in the preceding school year across twenty types of delinquency (e.g., defacing objects with paint, stealing from a store, injuring someone; a full list of items is presented in Appendix 6A). This measure was derived from a questionnaire that respondents completed themselves under supervision of a research assistant. Answer categories ranged from never (0) to more than ten times (5). The measure was constructed by summing the items while retaining the values of the original categories and treated as a count variable with a negative binomial distribution. Descriptive statistics of all the individual level variables are displayed in Table 6.1.

Individual involvement in unstructured socializing was operationalized with information from the space-time budget interviews. These interviews, similar to time diaries, collected information on the exact activities and whereabouts of respondents over four days (Friday, Saturday, and two weekdays). For every hour, respondents were asked about their main activity, who else was present and where the activity took place (both functional location and geographical location). To determine the geographical location, a detailed map was constructed. A grid with grid cells of 200 by 200 meters (656 by 656 feet; 0.04 km²) overlaid this map, determined independently from the official neighborhood boundaries. For more information on the space-time budget method, see Wikström, Treiber, and Hardie (2012c) or Chapter 3 (appeared as Hoeben et al., 2014). In Chapter 3 is described how the method was applied in the SPAN project specifically.

The measure for involvement in unstructured socializing expressed, per individual, the number of hours during the four space-time budget days that were spent in unstructured activity (e.g., hanging around; a full list of

activities is presented in Appendix A at the end of this book) in which one or more peers were present and adults were absent²⁹. Under the assumption that neighborhood characteristics will mainly affect unstructured socializing in the semi-public or public domain, hours were excluded if they took place in the respondents' homes or their friends' homes.

Additional measures were constructed that expressed a) the number of hours spent in unstructured socializing at locations more than one kilometer (0.62 miles) away from home and b) the number of hours spent in unstructured socializing (more than one kilometer away from home) in neighborhoods with varying levels of disorganization and disorder. The distance of one kilometer away from home was used a proxy for *being outside of the residential neighborhood*, following Wiehe et al. (2008b). One kilometer equals a walking distance of about ten minutes. The distance was calculated as the Euclidian distance in meters between the centroid of the home grid cell and the centroid of the location grid cell; see Figure 6.1. The location of the home was based on the main home in case respondents mentioned more than one (e.g., when parents were divorced). The whereabouts location was not always specified at the grid cell level, but was sometimes specified on a larger unit, such as—from micro to macro—the neighborhood, district, town within the municipality³⁰, or the municipality. Hours were included only if the location could be specified for at least the district level. In such cases, the centroid of the larger unit was used as proxy for the location of the respondent.

²⁹ The space-time budget data only includes information about the people who were known to the respondents. This specification allows for the possibility that respondents and their peers were 'unsupervised' in a public location crowded with adults.

³⁰ In some cases, municipalities in the Netherlands consist of two or more towns or small cities.

Table 6.1. Descriptive statistics for individual level variables ($N_{\max} = 387$ persons, 774 observations)

	Mean	(SD)	Min	Max	Alpha	ICC individual ^a	ICC neighborhood ^b
Delinquency	5.591	(8.959)	.000	100.000	.871	.383	.070
Unstructured socializing:	5.035	(4.672)	.000	33.000	-	.270	.096
More than 1km away from home	2.989	(3.349)	.000	22.000	-	.241	.044
In neighborhood with:							
High SES	.582	(1.260)	.000	7.000	-	.241	-
Med. SES	1.467	(2.318)	.000	22.000	-	.204	-
Low SES	.833	(1.817)	.000	13.000	-	.030	-
High mobility	1.146	(2.332)	.000	20.000	-	.070	-
Med. mobility	1.543	(1.908)	.000	14.000	-	.122	-
Low mobility	.202	(1.062)	.000	18.000	-	.000	-
High heterogeneity	.348	(1.149)	.000	13.000	-	.010	-
Med. heterogeneity	2.297	(2.823)	.000	22.000	-	.263	-
Low heterogeneity	.188	(1.015)	.000	19.000	-	.019	-
High family disruption	.302	(1.065)	.000	10.000	-	.152	-
Med. family disruption	1.567	(2.474)	.000	15.000	-	.163	-
Low family disruption	1.027	(1.869)	.000	22.000	-	.231	-
High population density	1.203	(2.204)	.000	15.000	-	.025	-
Med. population density	1.315	(2.005)	.000	22.000	-	.222	-
Low population density	.471	(1.160)	.000	8.000	-	.175	-
High structural density	.739	(1.340)	.000	7.000	-	.122	-
Med. structural density	1.986	(2.911)	.000	22.000	-	.207	-
Low structural density	.190	(.960)	.000	10.000	-	.000	-
High collective efficacy	.999	(1.796)	.000	18.000	-	.240	.089
Med. collective efficacy	1.057	(1.943)	.000	20.000	-	.105	.035
Low collective efficacy	.839	(1.846)	.000	13.000	-	.048	.017
High physical disorder	1.347	(2.127)	.000	13.000	-	.145	-
Med. physical disorder	1.254	(2.012)	.000	20.000	-	.185	-
Low physical disorder	.346	(1.216)	.000	19.000	-	.009	-
Gender (female = 1)	.440	(.497)	.000	1.000	-	-	-
Age in years	15.455	(1.971)	11.920	20.250	-	-	-
Ethnicity (ethnic minority = 1)	.509	(.500)	.000	1.000	-	-	.390
Parental monitoring	16.569	(4.511)	5.000	30.000	.802	.423	.047
Delinquent peers	8.960	(3.095)	6.000	24.000	.753	.372	.045
Self-control	29.810	(6.014)	10.000	48.000	.725	.540	.125

NOTES: Unstructured socializing in neighborhoods with 'high' socioeconomic status refers to unstructured socializing in the 25 percent neighborhoods that score highest on socioeconomic status; unstructured socializing in neighborhoods with 'low' socioeconomic status refers to the 25 percent of those neighborhoods that scored lowest on socioeconomic status. The other neighborhood characteristics should be interpreted in a similar manner. The ICCs are calculated as suggested by Hilbe (2011: 492) and Hosmer and Lemeshow (2000: 320).

ABBREVIATIONS: SD = standard deviation; Min = minimum; Max = maximum; ICC = intra-class correlation; km = kilometer; SES = socioeconomic status; Med = medium.

^aThe ICCs 'individual' express the percentage of the total variance that is at the individual level. For example, the ICC Individual of delinquency expresses that approximately 38 percent of the variance in delinquency is explained by differences between individuals. The other 62 percent is explained by changes over time within individuals.

^bThe ICCs 'neighborhood' express the percentage of the total variance that is at the neighborhood level (for T1). For example, the ICC Neighborhood of delinquency expresses that approximately 7 percent of the variance in individual involvement in delinquency is explained by differences between neighborhoods of residence. The other 93 percent is explained by differences between adolescents.

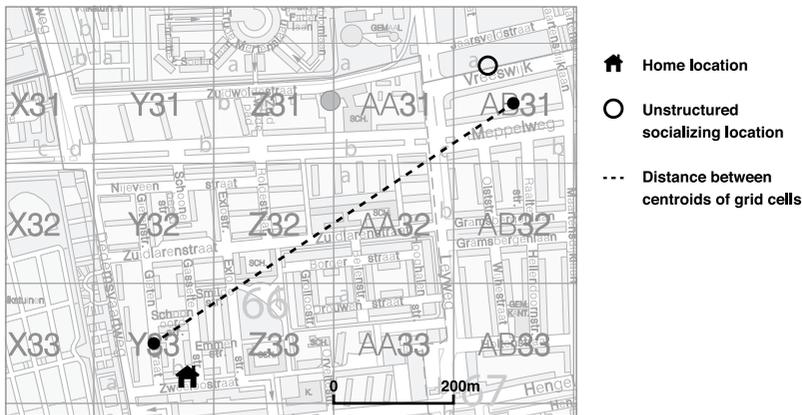


Figure 6.1. Distance estimation between home and whereabouts. The Euclidian distance was estimated as the distance in meters between the centroids of the home grid cell (here Y33) and the centroid of the grid cell where unstructured socializing took place (here AB31)

Several controls were included. Dummy variables indicated respondents' *gender* (1 = female) and *ethnicity* (1 = ethnic minority³¹). *Age* was expressed in years. *Parental monitoring* (Kerr and Stattin, 2003) was the mean of five items (e.g., 'I can just go out at night without having to tell my parents'), rated on a scale of YES! (1) to NO! (5). *Delinquent peers* was the mean of six items asking about the behavior of respondents' friends (e.g., 'How often do your friends destroy things?'), rated from (almost) never (1) to very often (each week; 4). *Self-control* (Grasmick et al., 1993) was the mean of ten items (e.g., 'I often do things without thinking of the consequences'), rated on a scale of YES! (1) to NO! (5). Alphas and other descriptive statistics of these variables are provided in Table 6.1.

31 The classification for ethnicity (a control variable) follows the definition of Statistics Netherlands that a person is from native Dutch descent if both parents are born in the Netherlands.

Neighborhood level measures

Eight measures were constructed that expressed characteristics of the residential neighborhoods, as well as of neighborhoods where the respondents spent their time. These measures were derived from different data sources: A measure for *collective efficacy* was derived from community surveys; measures for *socioeconomic status*, *neighborhood mobility*, *ethnic heterogeneity*, *family disruption*, *population density*, and *structural density* (high-rise buildings) were derived from census data; and a measure for *physical disorder* was derived from systematic social observations. Items and answer categories are reported in Appendix 6A. The construction of the variables from the community survey and the census data was described by Bruinsma et al. (2013), the construction of the variable from the systematic social observations was described in Chapter 4. Descriptive statistics of the neighborhood variables are displayed in Table 6.2.

The *community surveys* were conducted in 2009 as part of the SPAN project. Questionnaires were similar to those from the PADS+ study (Wikström and Butterworth, 2006; Wikström et al., 2010; Wikström et al., 2012a). Over 11,505 residents in The Hague and surrounding neighborhoods were sent a questionnaire, and 3,575 of them returned a completed form (31.1 percent). Respondents were asked to report about the area within five minutes' walking distance from their homes as a definition of their neighborhood. Ecologically reliable measures were constructed for 86 neighborhoods, with an average of 36 respondents per neighborhood. *Census data* (for the year 2008) were publicly available from Statistics Netherlands (BuurtKaart: Centraal Bureau voor de Statistiek, 2008) and BuurtMonitor (www.denhaag.buurtmonitor.nl). *Systematic social observations* were collected in 2012 as part of the SPAN project. In The Hague and surrounding areas, observers coded street segments of 100 meters on, for example, signs of physical disorder. GPS coordinates (derived from cameras equipped with a GPS device) were used to determine the exact location of the observations. Observations were restricted to workdays and were not executed on days that garbage was collected by the municipality. The observations were aggregated to measures for 253 neighborhoods, applying a method similar to the ecometrics approach of Raudenbush and Sampson (1999; see Chapter 4).

Table 6.2. Descriptive statistics for neighborhood level variables ($N = 86$ residential neighborhoods)

	Mean	(SD)	Min	Max	Alpha	Lambda ^a
Socioeconomic status	-.516	(3.419)	-8.010	5.310	.903	
Neighborhood mobility	.332	(.121)	.150	.730		
Ethnic heterogeneity	.627	(.159)	.210	.880		
Family disruption	8.110	(3.489)	1.790	16.680		
Population density	9.896	(5.321)	.570	24.925		
Structural density	38.324	(28.907)	.100	103.320		
Collective efficacy	-.200	(2.032)	-3.700	3.630		
Informal control	3.354	(.278)	2.830	3.940	.794	.789
Social trust	3.404	(.347)	2.780	4.060	.791	.904
Physical disorder	.178	(.314)	-.810	.750	.565	.237

NOTES: Alphas and lambdas are only provided where applicable.

ABBREVIATIONS: SD = standard deviation; Min = minimum; Max = maximum.

^aThe lambdas express the ecological reliability of the constructs (0-1, 1 being very reliable) and vary with the variance at neighborhood level (in empty models), as well as with the number of respondents per neighborhood for the constructs based on community surveys (informal control and social trust); and with the number of observed street segments and number of observers for the SSO construct (physical disorder).

Analytical strategy

The current study addresses three research questions. First, with descriptive analyses, it was investigated where the respondents spent their time in unstructured socializing: How far away from their homes and in what types of neighborhoods (given the level of disorder and disorganization). This served as a first exploration into the respondents' exposure to environmental influences from neighborhoods other than their own.

Second, it was investigated whether characteristics of the neighborhoods where adolescents spent their time in unstructured socializing affected the relationship between unstructured socializing and delinquency. This investigation was pursued by creating measures that expressed respondents' total number of hours spent in unstructured socializing in the 25 percent of neighborhoods with the highest score, the 25 percent of neighborhoods with the lowest score, and the other neighborhoods with average scores for each neighborhood characteristic (e.g., socioeconomic status, collective

efficacy).³² Measures were constructed that expressed respondents' total number of hours spent in unstructured socializing *one kilometer or more away from the home* in particular neighborhoods. Negative binomial fixed effects panel models (time nested in persons) were estimated to examine the influence of these measures on delinquency. Predictors were person-mean centered prior to analysis, and both person-means and deviations from person-means were entered into the models (as suggested by Allison, 2009). These models enabled the investigation of within-individual changes over time, which are unaffected by stable individual characteristics.

Third, it was examined whether residential neighborhood characteristics affected adolescents' involvement in delinquency directly and indirectly through their involvement in unstructured socializing in disadvantaged neighborhoods. This examination was addressed with cross-sectional random intercept-path models (persons nested in residential neighborhoods). The multilevel path models (2-1-1) were estimated in Mplus version 7.2 as unconfated multilevel models (Preacher, Zyphur, and Zhang, 2010).³³ Both the neighborhood level predictors and the individual level predictors were grand mean-centered (Enders and Tofighi, 2007), except the mediating variables (e.g., unstructured socializing); for those variables, both group mean-centered measures and group means were entered into the models to enable separation of the Between and Within components of the path from unstructured socializing to delinquency (Preacher, Zyphur, and Zhang, 2010). The indirect effects were estimated by multiplying the coefficients of two paths: One path from the neighborhood characteristics to unstructured socializing (group mean) and one path from unstructured socializing (group mean) to delinquency. Standard errors of the indirect effects were calculated with the multivariate delta method (Bollen, 1987). Negative binomial models were estimated with robust maximum likelihood estimation. Missing values were dealt with prior to model estimation by applying multiple imputation

32 The boundary of 25 percent was chosen arbitrarily. Additional analyses with a division based on 10 percent highest and lowest scores on the neighborhood characteristics showed substantially similar results (full tables are presented in Appendix 6F in the supplementary material). Nevertheless, the 25 percent division is advised for future studies because the number of neighborhoods per category, and thus the number of hours spend in neighborhoods from those categories, can become quite small with a division based on 10 percent boundaries.

33 Unconfated multilevel models are recommended over multilevel SEM models if one has few Level 1 units and low intra-class correlations (Preacher, Zyphur, and Zhang, 2010).

(expectation maximization method) for questionnaire constructs and with listwise deletion for the space-time budget measures.

Findings

Where do adolescents spend their time in unstructured socializing?

Descriptive statistics in Table 6.3 show that, relative to general time spent awake, time spent in unstructured socializing more often took place away from the direct home environment. Of all the space-time budget hours that respondents were *awake*, 45.8 percent was spent inside and 53.4 percent was spent outside of the direct home environment (home grid cell; the 200 by 200 meter grid cell where the respondent resided at the time of the interview)³⁴. While only 15.1 percent of *unstructured socializing* time was spent inside the direct home environment and 84.9 percent of the unstructured socializing time was spent somewhere else. This result was also found when looking at the residential neighborhood based on the boundaries as determined by Statistics Netherlands (CBS neighborhood; Table 6.3).

A similar pattern was visible for the distances between the respondents' homes and the locations where they spent their time (Table 6.3): 29.2 percent of the unstructured socializing hours was spent between one and three kilometers (0.6 to 1.9 miles) away from home, and another 28.4 percent (15.9 + 12.5) of the time was spent even further away. In comparison, of all the hours the respondents were awake, they spent 38.7 percent (18.7 + 11.4 + 8.6) at locations more than one kilometer away from home, including the hours spent at school. Thus, compared to other activities, unstructured socializing seems to occur farther away from the home and more often away from the residential neighborhood.

³⁴ Percentages do not add up to 100 because of missing information on activities or geographical location.

Table 6.3. Descriptive statistics of where time is spent awake in general and in unstructured socializing ($N = 387$ individuals)

		Awake		Unstructured socializing	
		No. of hours	% of hours awake	No. of hours	% of hours unstructured socializing
Total	Total hours in condition	47143	100.0	3897	100.0
	% of all hours	63.4 ^a		5.2 ^a	
	% of all hours awake	100		8.3	
Home grid cell ^b	Time inside	21589	45.8	590	15.1
	Time outside	25172	53.4	3307	84.9
CBS neighborhood ^c	Time inside	23256	49.3	991	25.4
	Time outside	23505	49.9	2906	74.6
Distance from home ^d	0-400m	23132	49.1	912	23.4
	400m-1km	3210	6.8	458	11.8
	1-3km	8824	18.7	1138	29.2
	3-5km	5364	11.4	620	15.9
	>5km	4062	8.6	487	12.5
	Missing information	2551	5.4	282	7.2

ABBREVIATIONS: No. = number; m = meter; km = kilometer; CBS = Statistics Netherlands.

^a Total number of hours for which information was available across the two waves: 74,304.

^b The 200 by 200 meter grid cell where the respondent resided at the time of the interview.

^c Residential neighborhood, neighborhood boundaries as defined by Statistics Netherlands.

^d Euclidian distance between the centroids of the home grid cell and the location grid cell.

If adolescents spend much time in unstructured socializing away from the home environment, where exactly do they hang out? Descriptive statistics and results of Wilcoxon signed rank tests presented in Table 6.4 indicate that unstructured socializing away from home (using a distance of one kilometer as a proxy for ‘away from home’) more often takes place in disorganized and disordered neighborhoods than in other neighborhoods. For example, respondents spend more time in unstructured socializing in neighborhoods with low socioeconomic status (on average 0.833 space-time budget hours) than in neighborhoods with high socioeconomic status (on average 0.582 hours). The difference was significant ($Z = -2.219$, $p < .05$). This pattern was visible for all investigated neighborhood characteristics, except for family disruption and collective efficacy: Respondents spent more time in unstructured socializing in neighborhoods with low levels of family disruption and high levels of collective efficacy.

Table 6.4. Involvement in unstructured socializing in neighborhoods with high and low levels of disorganization and disorder when > 1km away from home ($N = 387$ individuals)

	In neighborhoods with high:	In neighborhoods with low:	Wilcoxon signed rank test
Unstructured socializing away from home (> 1km) in neighborhoods characterized by:			
Socioeconomic status	.582	.833	-2.219*
Neighborhood mobility	1.146	.202	-10.571**
Ethnic heterogeneity	.348	.188	-3.767**
Family disruption	.302	1.027	-8.858**
Population density	1.203	.471	-7.606**
Structural density	.739	.190	-9.515**
Collective efficacy	.999	.839	-2.336*
Physical disorder	1.347	.346	-11.481**

NOTES: Unstructured socializing in neighborhoods with 'high' collective efficacy refers to unstructured socializing in the 25 percent neighborhoods that score highest on collective efficacy; unstructured socializing in neighborhoods with 'low' collective efficacy refers to the 25 percent of those neighborhoods that scored lowest on collective efficacy. The other neighborhood characteristics should be interpreted in a similar manner.

ABBREVIATION: km = kilometer.

+ $p < .10$; * $p < .05$; ** $p < .01$ (two-tailed).

Neighborhoods where time is spent in unstructured socializing

To investigate whether the unstructured socializing location (the level of disorder or disorganization in the neighborhoods where adolescents spend time in unstructured socializing) affects the relationship between unstructured socializing and delinquency, a series of fixed effects negative binomial panel models was estimated. Results of these models are presented in Table 6.5 and in the supplementary material (Appendices 6C, 6D, and 6E).

Table 6.5. Delinquency regressed on involvement in unstructured socializing (> 1km away from home) in different types of neighborhoods

	Model 1		Model 2		Model 3		Model 4	
	B	(SE)	B	(SE)	B	(SE)	B	(SE)
Unstr. soc. > 1km away	-.005	(.018)						
In neighborhoods with:								
High collective efficacy			-.027	(.025)				
Med. collective efficacy			-.004	(.023)				
Low collective efficacy			.065**	(.025)				
High informal control					-.024	(.025)		
Med. informal control					.005	(.024)		
Low informal control					.049*	(.024)		
High social trust							-.007	(.021)
Med. social trust							.008	(.024)
Low social trust							.085*	(.043)
Wald test low-mid			4.11*		1.50		2.20	
Wald test low-high			6.53*		4.03*		3.63+	
Wald test mid-high			.49		.77		.25	
Controls								
Age	-.111**	(.026)	-.113**	(.022)	-.110**	(.022)	-.103**	(.022)
Parental monitoring	-.050**	(.012)	-.060**	(.010)	-.062**	(.010)	-.059**	(.010)
Delinquent peers	.127**	(.016)	.113**	(.012)	.112**	(.012)	.112**	(.012)
Self-control	-.068**	(.008)	-.062**	(.007)	-.061**	(.007)	-.061**	(.007)
Intercept	3.401**	(.544)	3.570**	(.452)	3.515**	(.453)	3.375**	(.448)
N persons	344		383		383		383	
N observations	563		688		688		688	
Log likelihood	-1340.044		-1678.121		-1680.176		-1679.236	
AIC	2698.089		3382.243		3386.353		3384.472	
BIC	2737.088		3441.182		3445.292		3443.412	

NOTES: Results from negative binomial fixed effects panel models. Unstructured socializing in neighborhoods with 'high' collective efficacy refers to unstructured socializing in the 25 percent neighborhoods that score highest on collective efficacy; unstructured socializing in neighborhoods with 'low' collective efficacy refers to the 25 percent of those neighborhoods that scored lowest on collective efficacy. The other neighborhood characteristics should be interpreted in a similar manner.

ABBREVIATIONS: SE = standard error; km = kilometer; Unstr. soc. = unstructured socializing; Med/mid = medium; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion.

+ $p < .10$; * $p < .05$; ** $p < .01$ (two-tailed).

Model 1 in Table 6.5 represents the general relationship between unstructured socializing and delinquency. Contrary to the expectations and to findings from previous studies (e.g., Haynie and Osgood, 2005; Maimon and Browning, 2010; Osgood et al., 1996), it was not found that, for the subsample used in the current study, involvement in unstructured socializing away from home was related to delinquency. Neither was general unstructured socializing (Model 1 in Table 6D.1 in the supplementary material).

To determine whether disorganization and disorder in the neighborhoods where adolescents spend time in unstructured socializing would affect the unstructured socializing-delinquency relationship, separate models were estimated for the indicators of *disorganization* (socioeconomic status, neighborhood mobility, ethnic heterogeneity, family disruption, population density, structural density, and collective efficacy) and *physical disorder*. The results of these analyses, presented in Table 6.5 and in Tables 6C.1 and 6C.2 in the supplementary material, indicate that the unstructured socializing-delinquency relationship is especially affected by collective efficacy in the neighborhood (Table 6.5, Model 2). An increase of about one hour in unstructured socializing in neighborhoods with low levels of collective efficacy was associated with an increase in delinquency of 6.8 percent ($B = .065, p < .01, IRR = 1.068$), whereas unstructured socializing in neighborhoods with high levels of collective efficacy was not associated with delinquency ($B = -.027, p > .10, IRR = .973$; difference according to the Wald test: $\chi^2 = 6.53, p < .05$). Additional analyses (results presented in Models 3 and 4 in Table 6.5) showed that, of the two components within the collective efficacy construct, it was specifically the level of *social trust* in the neighborhood that raised the risk of delinquency, more so than *informal control*. Findings of supplementary analyses that included all hours of unstructured socializing (also within the direct home environment) were substantially similar to the findings previously described. (These findings are provided in Appendix 6D in the supplementary material.) These effects are considered to be a blend of environmental influences from the residential neighborhood and the other neighborhoods where time is spent in unstructured socializing.

The results support Hypothesis 1: Unstructured socializing is more strongly related to delinquency if it occurs in neighborhoods characterized by high levels of disorganization, particularly low collective efficacy. Contrary to Hypothesis 2, the level of physical disorder did not appear to affect the

unstructured socializing-delinquency relationship (Model 7, Table 6C.2 in the supplementary material).

The residential neighborhood

To examine whether residential neighborhood characteristics affect adolescents' delinquency by shaping their involvement in unstructured socializing in low collective efficacy neighborhoods, a series of cross-sectional random intercept-path models were estimated. Results are presented in Table 6.6, Table 6.7, and in the supplementary material (Appendices 6F and 6G). Prior to running these models, empty models were estimated to examine the variance in unstructured socializing and delinquency at the neighborhood level. Intra-class correlations are presented in the last column of Table 6.1 (column ICC neighborhood). The variation *within* neighborhoods, thus between individuals, is greater than the variation *between* neighborhoods. Nevertheless, variation between neighborhoods still accounts for 7.0 percent of the variance in individual delinquency and for 9.6 percent of the variance in individual involvement in unstructured socializing.

As a first step, the influence of residential neighborhood characteristics on adolescents' involvement in unstructured socializing was examined. Results, as presented in Table 6.6 (and Table 6F.1 in the supplementary material), indicate that ethnic heterogeneity in the residential neighborhood was predictive of adolescents' involvement in unstructured socializing: A one standard deviation increase in ethnic heterogeneity in the residential neighborhood was associated with a decrease of 14.0 percent (Model 1: $B = -.932$, $\beta = -.151$, $p < .10$, IRR of standardized coefficient = .860) in involvement in unstructured socializing. However, regarding unstructured socializing in low collective efficacy neighborhoods, there was a positive relationship (Model 2: $B = 5.470$, $p < .01$). This finding corresponds to the high correlation of ethnic heterogeneity and collective efficacy at the neighborhood level (Table 6B.3 in the supplementary material: $r = -.710$, $p < .01$). Thus, although adolescents from ethnically heterogeneous neighborhoods spent less time in unstructured socializing, the time they spent in unstructured socializing was more often spent in neighborhoods characterized by low collective efficacy. Other characteristics of the residential neighborhood were not consistently predictive of adolescents' involvement in unstructured socializing.

Table 6.6. Unstructured socializing measures regressed on individual control variables and residential neighborhood characteristics, wave 1 ($N_{\max} = 387$ individuals in 83 neighborhoods)

		Model 1 (DV = unstructured socializing)		Model 2 (DV = unstructured socializing in low collective efficacy neighborhoods)		Model 3 (DV = unstructured socializing >1km away in low collective efficacy neighborhoods)		
		B	(SE)	B	(SE)	B	(SE)	
Individual	Gender (female = 1)	.042	(.062)	.477*	(.214)	1.043	(1.415)	
	Age	-.010	(.032)	.055	(.062)	.120	(.130)	
	Ethnicity (minority = 1)	.015	(.089)	.307	(.287)	.316	(.728)	
	Parental monitoring	-.052**	(.010)	-.098**	(.025)	-.121	(.093)	
	Delinquent peers	.041**	(.016)	.068*	(.030)	.117	(.273)	
	Self-control	-.021**	(.008)	-.010	(.018)	.003	(.149)	
Neighborhood	Socioeconomic status	.016	(.029)	-.089	(.084)	-.013	(.108)	
	Neighborhood mobility	.855+	(.515)	.629	(1.367)	2.108	(6.855)	
	Ethnic heterogeneity	-.932+	(.526)	5.470**	(1.507)	3.964	(6.286)	
	Family disruption	.022	(.026)	-.046	(.073)	-.003	(.629)	
	Population density	.000	(.009)	-.008	(.033)	.012	(.098)	
	Structural density	.001	(.002)	-.004	(.006)	-.008	(.018)	
	Collective efficacy	-.012	(.039)	-.123	(.095)	.125	(.955)	
	Physical disorder	.128	(.126)	-.787	(.518)	-.620	(2.383)	
	Other	Residual var. unstr. soc.	.008	(.017)	.229	(.177)	.031	(5.960)
		Dispersion unstr. soc.	.310**	(.042)	1.418**	(.336)	4.479	(7.078)
Intercept unstr. soc.		1.629**	(.041)	-.446**	(.168)	-1.111	(2.538)	
Log likelihood		-6852.920		-6324.963		-6137.720		
BIC		13831.190		12775.275		12400.789		

NOTES: Results of cross-sectional two-level random intercept negative binomial models with robust standard errors. Neighborhood predictors and individual level control variables are grand-mean centered.

ABBREVIATIONS: DV = dependent variable; SE = standard error; km = kilometer; var. = variance; unstr. soc. = unstructured socializing; BIC = Bayesian Information Criterion.

+ $p < .10$; * $p < .05$; ** $p < .01$ (two-tailed).

As a second step, the influence of residential neighborhood characteristics on adolescents' involvement in delinquency was examined. Results, presented in Table 6.7 and Table 6G.1 in the supplementary material, indicate that none of the neighborhood characteristics was consistently related to delinquency. For wave 1 (Table 6.7), population density appeared to be the only neighborhood level predictor of adolescents' involvement in delinquency: A one standard deviation increase in population density was associated with a decrease of

17.7 percent in adolescents' delinquency (Model 1: $B = -.035$, $\beta = -.195$, $p < .05$, IRR of standardized coefficient = .823). Thus, adolescents from more highly urbanized backgrounds were slightly less often involved in delinquency (but note that the sample consisted almost exclusively of adolescents from highly urbanized backgrounds). For wave 2 (results presented in Table 6G.1 in the supplementary material) was found that three other neighborhood characteristics were related to adolescents' involvement in delinquency; adolescents were more likely to be involved in delinquency if they resided in neighborhoods characterized by low levels of collective efficacy, high levels of physical disorder, and high levels of family disruption. However, none of the investigated neighborhood characteristics were consistent predictors of adolescents' delinquency across different models and across both waves of the data collection.

Finally, in the third step was investigated whether adolescents' involvement in unstructured socializing (in low collective efficacy neighborhoods) mediated the relationship between residential neighborhood characteristics and adolescents' delinquency. Therefore, unstructured socializing measures were added to the model, see Models 2 and 3 in Table 6.7 (and in Table 6G.1 in the supplementary material). Incorporating these unstructured socializing measures into the model did not substantially alter the effect of population density on adolescent delinquency (in wave 1, Table 6.7), but appeared to reduce the effects of family disruption and physical disorder and appeared to strengthen the effect of collective efficacy (in wave 2, Table 6G.1). Supplementary analyses (presented in Table 6G.2 in the supplementary material), in which the indirect paths were estimated from residential neighborhood characteristics to adolescents' delinquency through their involvement in unstructured socializing, showed that the indirect paths did not differ significantly from zero.

In summary, the findings do not provide clear support for Hypothesis 3. Ethnic heterogeneity in the residential neighborhood is predictive of adolescents' involvement in unstructured socializing but not of adolescents' delinquency. Other neighborhood characteristics (population density, collective efficacy, physical disorder, and family disruption) appear to be predictors of adolescents' delinquency but not of adolescents' involvement in unstructured socializing. Estimated indirect paths from residential neighborhoods to adolescent delinquency through adolescents' involvement

in unstructured socializing do not differ from zero. Overall, there is no strong evidence that features of the residential neighborhood affect adolescents' delinquency because they shape adolescents' exposure to settings of unstructured socializing.

Table 6.7. Delinquency regressed on unstructured socializing, individual control variables, and neighborhood characteristics, wave 1 ($N_{\max} = 387$ individuals in 83 neighborhoods)

		Model 1		Model 2		Model 3	
		B	(SE)	B	(SE)	B	(SE)
Individual	Unstructured socializing			.049**	(.011)		
	Unstr. soc. in low coll. eff. nhoods					.077**	(.022)
	Gender (female = 1)	-.496**	(.126)	-.509**	(.127)	-.569**	(.137)
	Age	-.071+	(.041)	-.060	(.046)	-.056	(.042)
	Ethnicity (minority = 1)	.143	(.111)	.126	(.106)	.109	(.100)
	Parental monitoring	-.062**	(.015)	-.048**	(.015)	-.046**	(.017)
	Delinquent peers	.146**	(.017)	.131**	(.018)	.133**	(.018)
	Self-control	-.063**	(.009)	-.059**	(.009)	-.059**	(.010)
Neighborhood	Unstructured socializing ^a			.002	(.017)	.000	(.036)
	Socioeconomic status	.003	(.051)	-.006	(.053)	-.005	(.055)
	Neighborhood mobility	.295	(.706)	.127	(.718)	.070	(.670)
	Ethnic heterogeneity	.918	(.674)	.837	(.663)	.728	(.670)
	Family disruption	.038	(.033)	.031	(.033)	.036	(.035)
	Population density	-.035*	(.016)	-.033+	(.017)	-.036*	(.017)
	Structural density	-.002	(.003)	-.002	(.003)	-.001	(.003)
	Collective efficacy	.085	(.052)	.078	(.052)	.078	(.050)
	Physical disorder	.325	(.234)	.265	(.240)	.185	(.234)
Other	Residual variance delinquency	.000	(.000)	.005	(.058)	.009	(.050)
	Dispersion delinquency	.927**	(.085)	.873**	(.086)	.850**	(.095)
	Intercept	1.348**	(.052)	1.322**	(.104)	1.340**	(.090)
	N individuals	387		387		362	
	N neighborhoods	83		83		82	
	Log likelihood	-6814.830		-8105.391		-7377.196	
	BIC	13755.008		16352.845		14893.066	

NOTES: Results of cross-sectional two-level random intercept negative binomial models with robust standard errors. Unstructured socializing was group-mean centered, both the group-mean centered measure and the group mean were added to the models. Other predictors were grand-mean centered. The unstructured socializing measures incorporate all hours, including those in the residential neighborhood.

ABBREVIATIONS: SE = standard error; Unstr. soc. = unstructured socializing; low coll. eff. nhoods = low collective efficacy neighborhoods; BIC = Bayesian Information Criterion.

^a The unstructured socializing measure at neighborhood level is a group mean. It corresponds to the measures specified at the individual level (whether it is the general unstructured socializing measure, or unstructured socializing in certain neighborhoods).

+ $p < .10$; * $p < .05$; ** $p < .01$ (two-tailed).

Discussion and conclusion

There has been an increasing awareness of the need for an activity space oriented approach to environmental influences on individual behavior (e.g., Browning and Soller, 2014; Graif, Gladfelter, and Matthews, 2014; Kwan, 2012; Matthews and Yang, 2013; Wikström et al., 2012a). Nevertheless, few studies have paid attention to how neighborhoods other than the residential neighborhood affect adolescent delinquency (Graif, Gladfelter, and Matthews, 2014). The current study aimed to make a first step toward disentangling the interrelations between characteristics of the neighborhood where adolescents *reside*, characteristics of the neighborhoods *where they spend time in unstructured socializing* and adolescents' involvement in *delinquency*. A theoretical approach was proposed that integrated routine activities theory, specifically the unstructured socializing perspective of Osgood et al. (1996), broken windows theory, and social disorganization theory and built upon the behavior settings theory (Barker, 1963; Barker, 1968).

Three important findings emerged from the study. First, the location of unstructured socializing did not seem to be random: Of the time spent in unstructured socializing, adolescents spent a large part away from their direct home environments (about 30 percent of the time was spent between one and three kilometers, 0.6 to 1.9 miles, away from home) and more time in disorganized and disordered neighborhoods than in other neighborhoods (consistent with findings from Wikström et al., 2012a). Second, unstructured socializing away from the residential neighborhood (one or more kilometer away from home), spent in low collective efficacy neighborhoods, was more strongly related to individual delinquency than unstructured socializing in high collective efficacy neighborhoods. Third, residential neighborhood characteristics (particularly the level of ethnic heterogeneity) affected adolescents' involvement in unstructured socializing in general and in low collective efficacy neighborhoods. Findings about which residential neighborhood characteristics affected adolescents' involvement in delinquency were inconsistent. There was no support for an indirect effect of residential neighborhood characteristics on delinquency through adolescents' involvement in unstructured socializing. These findings have important implications for criminology.

Contribution to theory

First, the findings offer support for *social organization theory* (e.g., Sampson, Raudenbush, and Earls, 1997; Shaw and McKay, 1942). Unstructured socializing in neighborhoods with low levels of collective efficacy was more strongly related to delinquency than unstructured socializing in neighborhoods with high levels of collective efficacy. This finding implies that, in neighborhoods with low collective efficacy, less supervision is exerted over adolescents who are hanging out in those areas, thus allowing them to engage in delinquency. The study did not examine the locations where delinquency occurred, so that aspect remains speculative. Nevertheless, these implications are consistent with the main argument in the collective efficacy approach that residents from low collective efficacy neighborhoods are unable to maintain supervision, such as on groups of loitering teenagers, to prevent crime (e.g., Sampson, Raudenbush, and Earls, 1997; Sampson and Groves, 1989). These results were confirmed in analyses that only included the hours of unstructured socializing that were spent away from the home environment (more than one kilometer away) and thus offered a conservative test of the collective efficacy theory: The results suggest that collective efficacy also affects behavior of visitors in an area, not only of residents.

Second, the descriptions of where adolescents spent their time in unstructured socializing provide modest support for one of the elements of *broken window theory* (Wilson and Kelling, 1982) that “disorderly neighborhoods attract malevolents from outside the community” (Skogan, 2015: 481): Adolescents spent more of their time in unstructured socializing in disordered and disorganized neighborhoods than elsewhere. Stronger controls for individual characteristics and familial background are necessary to truly make the claim that adolescents are attracted by disadvantaged neighborhoods, but these results provide tentative support that such processes are at play (see also Bichler, Malm, and Enriquez, 2014, about ‘magnetic facilities’ for youth hangouts). On the other hand, the findings offer no robust evidence that indicators of physical disorder affected the unstructured socializing–delinquency relationship. The adolescents did not appear to be affected in their delinquency by the descriptive norm that inappropriate behavior is common in the disordered areas where they spent time in unstructured socializing (Keizer, Lindenberg, and Steg, 2008).

Third, the current study contributes to the literature on *unstructured socializing* (Osgood et al., 1996). Findings suggest that the relationship between unstructured socializing and delinquency is specified by the location where unstructured socializing takes place: Unstructured socializing is more strongly related to delinquency if it occurs in neighborhoods with low levels of collective efficacy. Supervision from residents and cohesion among residents in the neighborhood thus appear to strengthen the social control perceived by adolescents who are engaged in unstructured socializing in that area. These findings are consistent with previous findings suggesting that unstructured socializing is more strongly related to delinquency in public settings (Bernasco et al., 2013b; Weerman et al., 2013, Chapter 5). It appears that the broader environment, defined by the locations where activities take place, provides deterrence for delinquency over and above deterrence provided by the people who are present (or absent) in the immediate situation, i.e., the authority figures (Osgood et al., 1996).

Fourth and relatedly, the findings regarding supervision as exerted by the broader environment support ideas from behavior settings theory (Barker, 1968; Barker, 1987; Schoggen, 1989) that behavior patterns are shaped by social objects (people) present in the *setting*, not necessarily in the *activity*. The findings suggest that ‘unstructured socializing in areas of low collective efficacy’ is a criminogenic behavior setting; a situation that is conducive to delinquency, particularly to delinquency of adolescents. The study thus provides a theoretical framework as well as empirical support for specifying this criminogenic behavior setting and thereby offers one of the first practical definitions of a criminogenic behavior setting (see also the work of Wikström et al., 2010; and Wikström et al., 2012a).

Fifth, the current study contributes to the literature about ‘spatial entrapment’ (Matthews and Yang, 2013): Individuals from disadvantaged backgrounds are theorized to experience more constraints on their activity patterns because the facilities necessary to fulfill their needs may be expensive (money constraints), far away (spatial constraints), or in other ways inaccessible. Previous studies have suggested that a disadvantaged background (based on family or neighborhood) may affect adolescents’ involvement in unstructured socializing, although the direction of the association is inconclusive: Some studies suggested that adolescents from disadvantaged backgrounds are less likely to spend their leisure in

unstructured ways (Maimon and Browning, 2010; Osgood et al., 1996; see also Furstenberg et al., 1999), whereas others suggested that adolescents from disadvantaged backgrounds are more likely to do so (Lareau, 2003; Wikström et al., 2012a). Findings of the current study suggest that ethnic heterogeneity in the residential neighborhood predicts less involvement in unstructured socializing in general, but more involvement in unstructured socializing in low collective efficacy neighborhoods. This result was not found when examining the hours spent in unstructured socializing away from the residential neighborhood, which suggests that adolescents from ethnically heterogeneous neighborhoods hang out in their own neighborhoods and thereby increase their exposure to criminogenic behavior settings: Unstructured socializing in low collective efficacy areas (consistent with findings from Krivo et al., 2013 and Wikström et al., 2012a). Thus, the study provides some support for the relevance of the residential neighborhood in predicting an adolescents' involvement in unstructured socializing, but no consistent support was found for residential neighborhood characteristics that influence adolescents' delinquency. It seems that these aspects are worthy of further investigation.

Limitations and future research

Features of the SPAN data made it preeminently suitable for answering the research questions in the current study. Not only did the data include information on a wide variety of neighborhood characteristics, it also included space-time budget information on the whereabouts of a sample of adolescents, which was compatible with the neighborhood data. Nevertheless, the data have some limitations that one has to keep in mind when interpreting the findings. The most important limitations are addressed in this section.

First, it is possible that the data incorporated too few residential neighborhoods (82-84) and too few individuals per neighborhood (on average 4.6 adolescents per residential neighborhood) to detect subtle effects of the neighborhood characteristics on adolescent delinquency (Meuleman and Billiet, 2009). Thus, although the study did not provide support for neighborhood effects on delinquency, the findings cannot rule out their presence either.

Second, the sample used in the current study consists primarily of adolescents from highly urbanized backgrounds (the third largest city in the Netherlands), which limits the generalizability of the findings to urban contexts. Although previous research indicates that social disorganization theory generalizes to rural communities with regard to structural neighborhood characteristics (Osgood and Chambers, 2000), it is possible that collective efficacy is more relevant and may extend further away from home in rural areas than in cities. Additionally, adolescents from urban backgrounds may allocate their leisure differently: They have been found to travel shorter distances to their main hangout locations than adolescents from rural areas (Bichler, Christie-Merrall, and Sechrest, 2011). It would be interesting to further examine how environmental influences of areas away from the home environment affect adolescents' behavior in rural areas.

Third, a general limitation in ecological research is the lack of clarity of the concept *residential area*. In the current study, the distance of one kilometer from home was used as a proxy for being away from the direct home environment or residential neighborhood. This distance is, of course, as arbitrary as using census tracts; respondents may have different opinions about the boundaries of their neighborhoods (Basta, Richmond, and Wiebe, 2010). Relatedly, the current study ignores the embeddedness of residential neighborhoods within the surrounding neighborhoods (see discussions by Browning and Soller, 2014; Graif, Gladfelder, and Matthews, 2014; Matthews and Yang, 2013). Future studies need to scrutinize the effects of hanging out in nearby neighborhoods on delinquency and disentangle those influences from influences imposed on adolescents by the residential neighborhood, as most adolescents appear to hang out in areas about one to three kilometers away from their homes.

Fourth, not all information on the neighborhood characteristics was available for the same time periods as those covered by the space-time budgets. For example, unstructured socializing during the first wave of the SPAN data collection was measured in 2008-2009, whereas the community survey was conducted in 2009 and the systematic social observations were conducted in 2012. The current study was conducted under the assumption that the neighborhood characteristics were approximately the same over these years, but this may have introduced noise in the data.

A remaining question is how adolescents decide on their hanging locations. Distance from home may be a relevant factor (not too close to home in order to avoid watchful eyes, but not too far in order to avoid traveling), but other factors may be even more crucial, such as the location of the school, houses of friends, and facilities on the location itself (shelter, free WiFi, a nearby supermarket to buy alcohol and food). Determining the relevant factors in this location choice process will provide us with a better understanding of the interrelations between routine activities, neighborhood influences, and adolescent delinquency.

Concluding remarks

Despite these limitations, the current study makes important contributions to the literature on routine activity theory, social disorganization theory, broken windows theory, and related ecological perspectives on individual delinquency. The study indicates the necessity of examining neighborhood influences on individual behavior, based on individuals' spatial activity patterns in addition to that of their residential neighborhoods: There is more support for environmental influences on delinquency from the neighborhoods where adolescents spent their time unstructured socializing, than from neighborhoods where they reside. Although replication of this study and further investigation is warranted, the findings suggest that to understand adolescents' involvement in delinquency, *it may matter more where they are, than where they are from.*

Appendices Chapter Six

Appendix 6A. Items and answer categories of key variables

Supplementary material

(enclosed in a separate document available from the author):

- Appendix 6B. Bivariate correlations
- Appendix 6C. Neighborhoods where time is spent unstructured socializing: Other neighborhood characteristics
- Appendix 6D. Results for all hours unstructured socializing (also within direct home area)
- Appendix 6E. Results for alternative neighborhood classification (10 percent instead of 25 percent)
- Appendix 6F. Residential neighborhood and unstructured socializing
- Appendix 6G. Residential neighborhood and delinquency

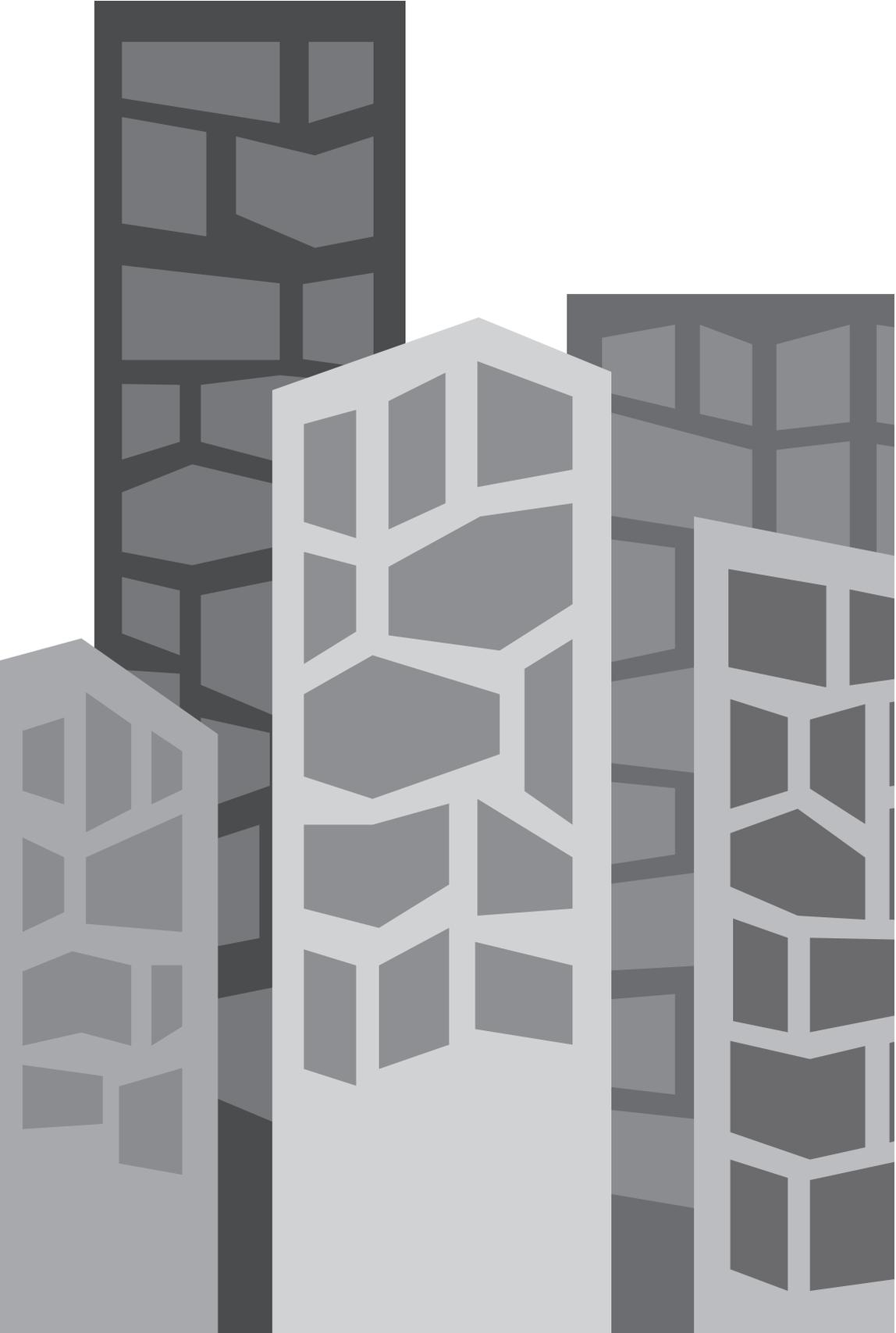
Appendix 6A

Table 6A.1. Items and answer categories of key variables

	Items and answer categories	Data source
Individual delinquency	Defacing objects with paint, pen, or spray paint; vandalism; setting fires; stealing something worth less than five euro (6.85 USD) from a shop; stealing something worth more than five euro (6.85 USD) from a shop; buying stolen goods; bicycle theft; moped theft; theft from a house; theft from a car; theft from elsewhere; robbery; stealing from someone covertly; threatening someone; kicking or hitting someone on the street; injuring someone by kicking or hitting; selling soft drugs; selling hard drugs; carrying a weapon; using a weapon. <i>Answer categories: never (0); once (1); twice (2); three to five times (3); six to ten times (4); more than ten times (5).</i>	Questionnaire
Neighborhood predictors		
Socioeconomic status	Composite score of 1) average estimated value of residential properties, both public housing and privately owned property, in the neighborhood on January 1, 2008; 2) number of general welfare benefits received per 1000 residential households in 2008; 3) percentage of residential potential working population that was unemployed on January 1, 2008; and 4) percentage of neighborhood households that, in 2008, had a gross income below the lowest quintile of the income distribution in the Netherlands.	Census data (first two items from Statistics Netherlands, last two from BuurtMonitor)
Ethnic heterogeneity	Blau/Herfindahl index that represents the likelihood that two random residents have a different ethnic origin. The index incorporates residents from native Dutch, Moroccan, Turkish, Surinamese, Antillean, and other ethnic backgrounds, according to the definition of Statistics Netherlands. The variable is based on information about neighborhood residents on January 1, 2008.	Census data (BuurtMonitor)
Neighborhood mobility	Number of residents who moved into the neighborhood in 2008 plus the number of residents that moved out of the neighborhood in 2008, divided by the number of residents living in the neighborhood on January 1, 2008.	Census data (BuurtMonitor)
Family disruption	Percentage of households that were single-parent families on January 1, 2008.	Census data (BuurtMonitor)

Continuation of Table 6A.1

	Items and answer categories	Data source
Population density	Number of residents per squared kilometer on January 1, 2008. Variable was recoded prior to analysis by dividing by 1000.	Census data (Statistics Netherlands)
Structural density	Percentage of residential properties in high-rise buildings (flats, apartments) on January 1, 2008.	Census data (BuurtMonitor)
Collective efficacy	Combined score of the constructs informal control (six items) and social trust (five items). Items of informal control were: 1) 'If a group of kids is skipping school and hanging around in the street, would your neighbors do something about it?'; 2) 'If kids were spraying graffiti on a building in your street, would your neighbors do something about it?'; 3) 'If a fight is going on before your house and someone is beaten or threatened, would your neighbors do something about it?'; 4) 'Suppose you are on holiday and your window would be smashed, would your close neighbors have it repaired when you were still away?'; 5) 'If a young kid is behaving without respect to an adult, would your neighbors do something about it?'; and 6) 'Suppose your community center will be closed, would your neighbors organize something to keep it open?'. Answer categories: <i>Very likely/likely/neither likely nor unlikely/unlikely/very unlikely</i> . (Items were recoded such that a high score indicated high informal control). Items of social trust were: 1) 'Neighbors are willing to help other neighbors'; 2) 'It is a close-knit neighborhood'; 3) 'People in this neighborhood can be trusted'; 4) 'People in this neighborhood generally do not get along with each other'; and 5) 'People in the neighborhood have very distinct norms and values'. Answer categories: <i>Totally agree/agree/do not agree nor disagree/disagree/totally disagree</i> . (Three items were recoded such that a high score indicated high social trust).	Community survey
Physical disorder	These measures are similar to the original construct as proposed by Sampson, Raudenbush, and Earls (1997). The measure for informal control differs in two minor aspects from the original construct: 1) It contained one additional item on whether neighbors would repair a smashed window when the respondent was on vacation and 2) 'Fire station' was replaced with 'community center', because Dutch fire departments are centrally organized and the item would thus not be relevant in its initial form. Construct of seven dichotomized items (signs of disorder) that were systematically tallied through systematic social observation: Dog feces, cigarette butts, litter or broken glass, empty bottles or cans, graffiti tags, graffiti pieces, and abandoned bicycles. The construct was corrected for observational conditions and observer characteristics prior to analysis, as described in Chapter 4 of this book.	Systematic social observation



Chapter Seven.

Characteristics of the Present Peers

Hoeben, Evelien M., D. Wayne Osgood, Sonja E. Siennick, and Frank M. Weerman. 2016. Hanging out with the wrong crowd? Unstructured socializing, delinquency and characteristics of the present peers. *Submitted to Social Forces*.



Characteristics of the Present Peers

*It is better to walk alone, than with a crowd going
in the wrong direction – Diane Grant*

Adolescents in western societies spend a lot of their time talking and ‘just hanging out’ with friends (Anderson, 2013; Larson and Verma, 1999). This is part of a developmental process toward autonomy and adulthood and contributes positively to emotional and social functioning (Giordano, 2003). Nevertheless, time spent with peers may also, under certain conditions, contribute to risks for engagement in delinquency and substance use (Weerman et al., 2013). The current study attempts to further specify the conditions under which time with peers is related to an increased risk of delinquency. More specifically, the study examines whether unstructured socializing with some peers is more strongly related to delinquency than unstructured socializing with other peers.

Osgood et al. (1996) coined the term ‘unstructured socializing’ for situations in which peers are present, authority figures are absent, and there is a lack of structured activity. They argued that individuals who are more often engaged in activities characterized by these conditions are at greater risk of becoming involved in delinquency or substance use. Their arguments and findings have been confirmed in other studies (e.g., Bernasco et al., 2013b; Bernburg and Thorlindsson, 2001; Maimon and Browning, 2010). The current study builds on the unstructured socializing perspective *first* by theorizing about four situational peer processes that might stimulate delinquency, and *second*, by identifying friend characteristics that facilitate these processes. Thus, our hypotheses about delinquency conducive friend characteristics are derived from the theorized situational processes, even though we cannot tell the processes apart with our data.

Data from the PROSPER Peers project are used. This project is a longitudinal intervention study among rural adolescents (aged 10 to 17) in

two US states. The data incorporate sociometric information linked with information on how often respondents ‘hang out’ with their nominated friends. The analyses investigated whether unstructured socializing with delinquent friends, risk-seeking friends, friends who were tolerant toward rule breaking, and older friends was more strongly related to delinquency than unstructured socializing with other friends.

Unstructured socializing and delinquency

Osgood et al. (1996) adapted the routine activity theory (Cohen and Felson, 1979) and lifestyle theory (Hindelang, Gottfredson, and Garofalo, 1978) to an individual perspective on deviant behavior. They argued that three conditions contribute to the risk of deviance in a certain situation. The *presence of peers* makes deviant acts rewarding, because peers can serve as an appreciative audience. The *absence of authority figures* decreases the risk of getting caught. A *lack of structured activity* enables engagement in other (deviant) activities. Osgood et al. (1996) argued that adolescents who spend more time in situations characterized by these conditions—that is, in ‘unstructured socializing’—are likely to have higher deviance rates, because most adolescents are open to the idea of deviance (Briar and Piliavin, 1965; Matza and Sykes, 1961). Since their publication in 1996, the relationship between unstructured socializing and delinquency has often been empirically confirmed (e.g., Bernasco et al., 2013b; Maimon and Browning, 2010; Osgood and Anderson, 2004).

The current study aims to refine the routine activity theory of general deviance (Osgood et al., 1996) by further specifying the characteristics of the present peers that contribute to the risk of delinquency in situations of unstructured socializing. Haynie and Osgood (2005) already argued that unstructured socializing may result in delinquency regardless of whether the involved adolescents have delinquent friends (because deviant or ‘subterranean’ values are widespread; Matza and Sykes, 1961), but that the effects of normative peer influences (having delinquent friends) and opportunity influences (involvement in unstructured socializing) may nevertheless strengthen each other. In addition to their assertions, we state that involvement in unstructured socializing is always associated with an

increased risk for delinquency, regardless of which peers are present, but that this risk *increases* if certain peers are present.

To arrive at hypotheses about *which* peers contribute to delinquency conducive situations, we first need to know *how* peers induce delinquency in a situation. Thus, in the following section, we will discuss four situational peer processes that are theorized to contribute to delinquency conducive situations and will then discuss which characteristics make friends likely to facilitate these processes. The situational peer processes are derived from literature on peer influence, co-offending, and conflict situations.

Situational peer processes

The current study is concerned with the peers that contribute to a delinquency conducive situation, and thus with situational peer processes. We will briefly discuss four situational peer processes: One that was already suggested by Osgood et al. (1996), and three additional processes. All of these processes operate short-term and are based on the physical presence of peers. The processes therefore differ from socialization: Socialization refers to a long-term influence process in which reinforcement by peers results in the adoption of positive or negative attitudes toward delinquent behavior (e.g., Akers, 1998; Sutherland, 1947), whereas situational peer influence refers to short-term processes that directly influence behavior in one situation (e.g., Briar and Piliavin, 1965; Warr, 2002). Situational processes may transfer influence across situations by impelling the adoption of delinquency favoring attitudes, but this does not necessarily have to be the case: Peers can provoke or reinforce an adolescent into situational behavior that he or she does not wish to repeat.

First, the peers who are present in a situation of unstructured socializing can positively or negatively *reinforce* delinquency in their responses to talk and behavior (e.g., Dishion, Andrews, and Crosby, 1995; Dishion et al., 1996). Delinquent behavior potentially bears “symbolic rewards of enhanced status and reputation”, but only if it comes to the attention of others (Osgood et al., 1996: 639). Present peers may function as an appreciative audience and thereby provide situational inducements for delinquent acts (Briar and Piliavin, 1965). Similarly, co-offending can bring about immaterial

'exchanged goods' of affection, tolerance or status (Weerman, 2003). Thus, the peers who are present in a situation of unstructured socializing contribute to the risk for deviancy because their presence potentially brings about social rewards for such behavior. The reverse is also possible: Avoiding negative social responses offers a powerful reason to join (delinquent) group actions. A negative reinforcement is (anticipated) ridicule (Warr, 2002).

Second, the peers with whom adolescents are engaged in unstructured socializing can also encourage delinquency or substance use by *instigating* delinquent acts. For most delinquent group events, there is one person identifiable as the 'instigator': The person who takes the initiative or who suggests delinquent acts to others (Warr, 1996). Who the instigator will be depends less on personality than on the situation and group composition. The individual who has the strongest material or immaterial needs and desires has the most reason to initiate a delinquent act (Weerman, 2003). Thus, the individuals who experience the most economic adversity (McCarthy, Hagan, and Cohen, 1998; Nguyen and McGloin, 2013) or who are the most in need of social affirmation will be the ones who instigate offenses. Nevertheless, the *success* of instigating an act (whether others will join in on the action) also depends on whether the individual has enough authority to convince others. An individual's authority depends on whether he or she has enough skills (McGloin and Nguyen, 2012) and social status.

A third way in which the peers who are present in a situation of unstructured socializing may evoke (aggressive) delinquency of the target adolescent is through *provocation* by showing disrespect or by attacking his or her status with verbal remarks. Status threats sometimes directly provoke delinquent behavior to 'save face' (Warr, 2002). The response may be particularly aggressive if the defendants are concerned with their (masculine) identity, or if others are present (Felson, 1982). The most important reasons to exert provocations upon others are to acquire or regain status (Anderson, 1999; Short and Strodbeck, 1965; Tedeschi and Felson, 1994). Most studies in this theoretical area have focused on the provocation of violence, but we wish to stress that status threats can also come in the form of behavioral challenges (e.g., "you would never do that") that inspire acts of vandalism, theft or substance use.

Finally, peers may contribute to a delinquency conducive situation by their *mere presence*, because groups enhance risky decision making

(Gardner and Steinberg, 2005). In the anonymity of a group, individuals feel unaccountable. The presence of others allows the individual to transfer portions of the blame to others (e.g., “He did it too”), and thus makes inner restraints less important (Postmes and Spears, 1998). Furthermore, people have a tendency to behave in accordance with the group (Kiesler and Kiesler, 1969), which will translate into delinquency if they follow the group in a delinquent act. These collective processes are assumed to operate independently from characteristics of the individuals within the group and we will not discuss them further here.

In summary, we theorize that the peers who are present in a situation of unstructured socializing may encourage an adolescent to commit delinquent acts 1) by responding affirmatively to delinquent behavior and thereby providing positive *reinforcement* for delinquency; 2) by *instigating* a delinquent event; 3) by threatening his or her status and thereby *provoking* a (violent) response; 4) by *merely being present* and thus contributing to the number of people present, providing a group setting that “deflects, dilutes or supplants moral responsibility” (Warr, 2002: 70).

Whose presence stimulates delinquency?

We will now attempt to identify *characteristics of friends* that make them likely to qualify as a reinforcer, an instigator, or a provoker.

Friends' delinquency

Involvement in delinquency qualifies friends as potential reinforcers and instigators. Friends who are involved in delinquency may be likely to *reinforce* similar behaviors by others. Because of their own rule breaking, their cognitive frameworks may be more ‘delinquency tolerant’. This would make them more likely to respond affirmatively to ‘deviant talk’, as it confirms their own beliefs and behavior, and thereby to reinforce delinquency (Dishion et al., 1996). In line with this idea, Dishion et al. (1996) found that, within dyadic conversations, if the other peer is antisocial, he or she may push the conversation (further) toward rule breaking topics, regardless of whether the target adolescent is prosocial or antisocial.

Friends who are involved in delinquency may also be more likely to *instigate* delinquent acts, because they have gained the knowledge, specialized skills and confidence needed to initiate those acts (McGloin and Nguyen, 2012), because they are more responsive to criminal opportunities (Apel, 2013), and because they have the authority to gain followers: Others expect them to ‘know what they are doing’. Empirical studies have confirmed that delinquent peers are more likely to be instigators (McGloin and Nguyen, 2012; Van Mastrigt and Farrington, 2011; Warr, 1996).

Friends may qualify as likely instigators not only on the basis of their experience with delinquent behavior in general, but also on the basis of the type of delinquency they have engaged in. Individuals are more likely to instigate an act that they have developed skills for or with which they have some experience (McGloin and Nguyen, 2012). This is relevant for our research question because some types of delinquency are more likely to occur in the presence of peers than other types. For example, vandalism and drug use are more often committed with others than violent crimes and minor thefts (Erickson and Jensen, 1977; Weerman, 2003). Furthermore, empirical studies indicate that some types of delinquency, particularly property delinquency, are more likely to occur as co-offenses with recruiters than are others (Van Mastrigt and Farrington, 2011; Reiss and Farrington, 1991).

Based on these previous studies, we hypothesize that unstructured socializing with delinquent friends is more strongly positively related to delinquency than unstructured socializing with non-delinquent friends (Hypothesis 1). We also expect this effect to differ across types of delinquency: We hypothesize that the presence of friends who have committed theft, vandalism or substance use will contribute more strongly to same-type delinquency than will the presence of friends who have committed violence (Hypothesis 2).

Friends’ risk-seeking

A high risk-seeking tendency qualifies friends as potential reinforcers and instigators. Adolescents with high risk-seeking tendencies may be more likely than others to try new things and experiment with substance use and breaking the rules: “The fact that an activity involves breaking the law is precisely the fact that often infuses it with an air of excitement” (Matza and Sykes, 1961:

713). We expect that friends with high risk-seeking tendencies are therefore likely to *reinforce* the delinquent behavior of others, because in their eyes such behavior demonstrates honorable qualities such as daring and spontaneity. They may also be more likely to *instigate* delinquent acts because they find the thrill of such behavior rewarding. As previously discussed, individuals with the strongest needs—in this case, for thrills—have the most reason to initiate delinquency. Indeed, McGloin and Nguyen (2012) found that offenders who had engaged in crime ‘because it was exciting’ had an increased chance of instigating group crimes. Some previous studies found a relationship between risk-seeking and co-offending, though they did not specify what processes (reinforcement, instigation, provocation) were at play. McCarthy, Hagan, and Cohen (1998) found that two co-offending strategies (enlisting and collaborative orientation) were encouraged by a willingness to take risks. Nguyen and McGloin (2013: 860) concluded that excitement seeking was “one of the strongest and most consistent predictors of co-offending.” In the current study we will test the hypothesis that unstructured socializing with friends who have high risk-seeking tendencies is more strongly positively related to adolescent delinquency than unstructured socializing with friends who have moderate or low risk-seeking tendencies (Hypothesis 3).

Friends’ attitudes

Tolerance toward rule breaking qualifies friends as potential reinforcers, instigators and provokers. Friends who are tolerant toward rule breaking may be more likely than others to *reinforce* delinquent acts, as these acts are less incongruent with their moral values. Also, friends who are tolerant toward rule breaking may be more likely to *instigate* delinquent acts, because they feel less internal restraints against proposing delinquent acts. McCarthy, Hagan, and Cohen (1998) found in this regard that intolerance toward rule breaking (believing in honesty) prevented instigation strategies, but that tolerance toward rule breaking (believing it is acceptable to take another’s property) did not stimulate instigation or joining. Finally, friends who are tolerant toward rule breaking may be more likely to *provoke* one another to increase their own status. We expect this to especially be the case if the friends have internalized attitudes that justify violence as a means of obtaining or regaining respect (Anderson, 1999; Short and Strodbeck, 1965). Short and

Strodtbeck (1965: 233) observed aggression within friendships and reported about a “threat which hangs over even the closest of friendships that one may have to prove oneself against one’s friend.”

In the current study we will test the hypothesis that unstructured socializing with friends who are highly tolerant toward rule breaking is more strongly positively related to delinquency than unstructured socializing with friends who are moderately tolerant or intolerant toward rule breaking (Hypothesis 4).

Friends’ age

Older friends are likely to qualify as *instigators*, whereas the presence of younger friends can trigger an adolescent to instigate delinquency himself. Older friends have more material needs and relatively more social status, and therefore may be more likely to instigate an offense (Weerman, 2003). They are also most likely to convince others to participate, because they serve as role model: Older friends often have more privileges (possessions as well as autonomy, Moffitt, 1993) and (perceived) life experience (Harding, 2009; Warr, 1996). It is relative age that seems important: Adolescents will instigate delinquency if they are the oldest of the peers who are present in that particular situation (Warr, 1996).

Existing studies confirm that older peers are more likely to instigate crimes (Van Mastrigt and Farrington, 2011; Warr, 1996). Age differences are generally small: Members of adolescent delinquent groups are often less than one year apart and overall not more than two years (Sarnecki, 2001; Reiss and Farrington, 1991; Warr, 1996). Previous studies have not clarified the point at which the age difference becomes relevant for increased risks of co-offending and instigation. Is a three months age difference enough to increase the chance that adolescents instigate crime? Or does it start to get ‘risky’ when friends are at least six months, or perhaps nine months apart? This study further explores these questions and tests the hypothesis that unstructured socializing with older or younger friends is more strongly positively related to delinquency than unstructured socializing with friends of the same age (Hypothesis 5). The PROSPER data are based on in-grade nominations, so the age differences between respondents and their nominated friends are generally one year or less.

Current study

The current study investigates whether the presence of certain friends increases the risk for delinquency in situations of unstructured socializing. To do so, the study combines sociometric data with information on how often respondents spend time 'hanging out' with their nominated friends. The study contributes to existing research in several ways. First and foremost, the study examines the friends with whom adolescents are *actually involved* in unstructured socializing. Previous empirical studies that addressed delinquent peer-unstructured socializing interactions in predicting delinquency or substance use investigated whether generally having delinquent friends interacted with the effect of respondents' overall involvement in unstructured socializing. Their findings were contradictory: Some studies reported significant positive interactions (Bernburg and Thorlindsson, 2001; Sentse et al., 2010; Svensson and Oberwittler, 2010; Thorlindsson and Bernburg, 2006; Wikström et al., 2012a), whereas others did not find evidence of an interaction (Agnew, 1991; Haynie and Osgood, 2005). The studies that found interactions generally did not take into account the skewed distributions of the dependent variables. None of the studies examined the specific friends with whom adolescents engaged in unstructured socializing, even though adolescents spend more time unstructured socializing with some friends than with others (Siennick and Osgood, 2012).

Second, the current study investigates a *broad array of friend characteristics* that may contribute to a crime conducive situation. We take into account not only friends' delinquent behavior, but also their type-specific delinquency, their risk-seeking tendency, their attitudes and whether they are older or younger than the respondent.

Finally, *methodological improvements* over previous studies include the use of a longitudinal design and friends' reports about their own characteristics. Most previous studies on this topic relied on cross-sectional data and were therefore less able to control for selection effects that could occur if crime prone adolescents generally prefer unstructured socializing to other leisure activities. Also, most of the existing studies on this topic did not use sociometric data, but instead asked respondents to report about the behavior of their friends, which may cause bias due to 'projection' effects (Young et al., 2015).

Data and methods

Data for this study were collected in 28 rural public school districts in Iowa and Pennsylvania (USA) as part of the PROSPER Peers project. Students in these districts were predominantly white, English speaking and from rural backgrounds. At least fifteen percent of the families in each district was eligible for free or reduced cost school lunches. The sample was two entire cohorts of sixth graders (aged 11 to 12); the first cohort completed in-school surveys in the fall of 2002 ($N = 6,440$), and the second cohort in the fall of 2003 ($N = 6,058$). Both cohorts were surveyed again in the spring of the same school year (wave 2) and in the three subsequent springs (waves 3 to 5). The project allowed new students to enroll at later points in the study. If respondents from the first cohort repeated a grade, they were enrolled in the second cohort the year after.

Respondents were asked to nominate two 'best' friends and five 'close' friends from their own grade. These nominations were later matched to names of other participants based on school rosters. The procedure was computer assisted and used programs to identify spelling matches and phonetic matches. Two coders visually inspected the matches and tried to match names that went unmatched during the computer-assisted process. Of all nominated friends, 82.7 percent were successfully matched to students on the school rosters, 1.9 percent could not be matched due to multiple plausible matches, 0.5 percent were inappropriate nominations such as celebrities or self-nominations, and 14.9 percent appeared to be friends outside of the respondents' grade or school. The respondents nominated 4.0 friends on average. Additional questions were asked to determine the number of friends outside of respondents' school and grade; on average at each wave, respondents had 1.7 friends in other grades and 1.5 friends in other schools³⁵.

The current study included only those respondents with valid information on the study variables for at least two waves. Of the total of 16,284 respondents, 2,167 (13.3 percent) were excluded because they participated in only one wave; 1,150 (7.1 percent) because they nominated

³⁵ The answer categories for these questions did not include an option for 'no friends from other grades or other schools'. Therefore, we treated missing values as zero. When missing values are excluded, respondents reported on average 6.1 friends in other grades in school and 5.4 friends from other schools.

zero friends across all waves; 135 (0.8 percent) because their nominated friends could not be matched; 142 (0.9 percent) because their matched friends provided insufficient information about the key variables; 5 because they did not provide complete information on the dependent variables; and 1596 (9.8 percent) because after excluding person-observations based on these criteria, they had valid information for only one wave. The remaining 11,089 respondents generally had higher grades, were less often eligible for free lunch and were more often engaged in unstructured socializing than the excluded respondents, but the groups did not differ in other aspects³⁶.

The final sample is 11,089 respondents contributing 40,582 observations. The sample was roughly evenly split on gender (45 percent male), predominantly white (83 percent) and from two parent families (79 percent), and a sizable minority was eligible for free or reduced cost school lunch (27 percent). For more information on the sample and data collection, see other publications based on these data (e.g., Ragan, Osgood, and Feinberg, 2014; Siennick and Osgood, 2012).

Measures

Delinquency was assessed by asking respondents how often they had been involved in twelve types of delinquency in the past year (e.g., whether they had purposely damaged property or stolen from a store; a full list of items is presented in Appendix 7A at the end of this chapter). Answer categories ranged from never (0) to five or more times (4). The delinquency measure is the sum of the frequency scores across the twelve items. *Substance use* is the sum of the frequency scores on four items on the past year frequency of marijuana use, methamphetamine use, inhalant use and being drunk. Answer categories ranged from not at all (0) to more than twelve times (4). Three other delinquency specific measures were similarly constructed with items that were also included in the general delinquency measure: *Theft* (four items), *vandalism* (two items) and *violence* (one item). All measures were highly skewed and treated as counts. Descriptive statistics are shown in Table 7.1.

³⁶ Only differences with medium to large effect sizes (> 0.25) are reported here. The other statistically significant differences had very small effect sizes, suggesting that their significance was due to the large sample size.

Table 7.1. Descriptive statistics ($N_{\max} = 40,582$ person-observations)

	Proportion of friends ^a	Mean	(SD)	Min	Max	Alpha	ICC ^b
Delinquency		2.142	(4.879)	.000	48.000	.872	.437
Substance use		.471	(1.490)	.000	16.000	.656	.281
Theft		.731	(2.103)	.000	16.000	.826	.362
Vandalism		.326	(.986)	.000	8.000	.626	.352
Violence		.402	(.905)	.000	4.000	-	.412
Unstructured socializing		3.674	(2.491)	.000	10.580	-	.355
with delinquent friends	42.933	2.260	(2.141)	.000	10.580	-	.306
with non-delinquent friends	57.067	2.666	(2.309)	.000	10.580	-	.295
with substance using friends	18.111	1.117	(1.728)	.000	9.800	-	.176
with non-substance using friends	81.889	3.412	(2.540)	.000	10.580	-	.302
with friends who steal	21.899	1.374	(1.809)	.000	9.800	-	.227
with friends who do not steal	78.101	3.326	(2.465)	.000	10.580	-	.319
with vandalizing friends	17.165	1.130	(1.681)	.000	9.800	-	.209
with non-vandalizing friends	82.835	3.463	(2.495)	.000	10.580	-	.329
with violent friends	22.898	1.415	(1.860)	.000	10.580	-	.269
with non-violent friends	77.102	3.317	(2.444)	.000	10.580	-	.338
Prop. of reciprocal friends who are							
delinquent		.409	(.392)	.000	1.000	-	.255
substance using		.166	(.303)	.000	1.000	-	.153
stealing		.206	(.318)	.000	1.000	-	.199
vandalizing		.157	(.285)	.000	1.000	-	.190
violent		.210	(.324)	.000	1.000	-	.262
Gender (male = 1)		.450		.000	1.000	-	-
Ethnicity (white = 1)		.830		.000	1.000	-	-
Age in years		13.46	(1.315)	10.000	17.000	-	-
Free lunch (free lunch = 1)		.270		.000	1.000	-	.650
Grades		4.110	(.876)	1.000	5.000	-	.627
Two parent family (two parents = 1)		.790		.000	1.000	-	.729
Parental knowledge		4.534	(.729)	1.000	5.000	.849	.420
Number of nominated friends		4.878	(1.873)	1.000	7.000	-	.348
Risk-seeking		2.116	(.986)	1.000	5.000	.771	.403
Attitudes toward substance use		4.446	(2.139)	3.000	12.000	.836	.314
Willingness to act different		4.160	(.753)	1.000	5.000	.624	.340
Perc. social rewards from subst. use		1.417	(.658)	1.000	5.000	.951	.349

ABBREVIATIONS: SD = standard deviation; Min = minimum; Max = maximum; Prop. = proportion; perc. = perceived; subst. = substance.

^aProportion of nominated peers characterized by this feature.

^bThe ICCs are calculated in Stata as suggested by Hilbe (2011) and Hosmer and Lemeshow (2000). The ICCs express the percentage of the total variance that is at the individual level (versus the person-observation level). For example, the ICC for delinquency expresses that approximately 44 percent of the variance in delinquency is explained by differences between adolescents. The other 56 percent is explained by differences within adolescents over time.

Involvement in unstructured socializing was measured by asking the respondent for each nominated friend, “How often do you spend time just hanging out with this person outside of school (without adults around)?” Answer categories were never (0); once or twice a month (1); once a week (2); a few times a week (3); and almost every day (4). These responses were summed across respondents’ friends and divided by the square root of the number of those friends (range 1 to 7), following the approach taken by Haynie and Osgood (2005).³⁷

The unique structure of the data allowed us to specify with which friends respondents spent most time unstructured socializing and how that related to their involvement in delinquency. Furthermore, because the friends were also enrolled in the study, it was possible to obtain information about those friends’ characteristics based on *responses of those friends*, rather than relying on respondents’ reports about their friends.

We constructed several measures that combined characteristics of the friends with the time the respondent spent in unstructured socializing with them. For example, for each respondent we constructed two variables: One variable expressing the time spent in unstructured socializing with delinquent friends, and the other variable expressing the time spent in unstructured socializing with non-delinquent friends. Our primary variables of this type and their descriptive statistics are presented in Table 7.1. Descriptive statistics for additional such variables that were used in supplemental analyses are shown in Appendix 7C at the end of this chapter. In the remainder of this section, we discuss the operationalization of the friend characteristics (i.e., the characteristics of the friends with whom respondents reported engaging in unstructured socializing). These friend measures were constructed with information about the two *best friends* and the five *close friends* nominated by the respondent (the ‘send’ network).

Friends’ delinquency was measured for each friend in a similar manner as for respondents. Type-specific measures were constructed to express

37 Two other possible approaches are to simply take the sum without correcting for the number of friends (the summative measure), or to divide the sum by the number of friends (the averaged measure). All models were replicated with averaged measures instead of the square root measures (results presented in Appendix 7F in the supplementary material). The findings were fairly similar across measurement strategies, but the models using the square root measure fit the data better than the models using the averaged measure. See Appendix 7B at the end of this chapter for a more detailed discussion of the different measures.

friends' involvement in substance use, theft, vandalism and violence. The descriptive statistics in Table 7.1 indicate that, on average per respondent, 42.9 percent of the nominated friends had engaged in at least one type of delinquency in the past year, 18.1 percent had been drunk or used drugs, 21.9 percent had committed theft, 17.2 percent had committed vandalism, and 22.9 percent had committed violence. Other variables express whether the friend was a 'medium frequent offender' or 'high frequent offender'. High frequent offenders belonged to the ten percent with the highest scores on that particular delinquency type (i.e., they reported seven or more offenses overall in the previous year; or two or more incidents of substance use, theft, vandalism or violence); medium frequent offenders were the 'other' offenders who committed at least one offense.

Friends' risk-seeking tendencies were measured with three items on, for example, how often the friends 'do what feels good, regardless of the consequences' (see Appendix 7A at the end of this chapter for the full list of items). Friends' risk-seeking tendencies were defined as 'high' when friends scored one standard deviation or more above the mean, and as 'low' when they scored one standard deviation or more below the mean. Following this definition, 14.9 percent of the nominated friends per respondent had high risk-seeking tendencies, 19.5 percent had low risk-seeking tendencies, and 65.6 percent had moderate risk-seeking tendencies (Table 7C.1 in the Appendix of this chapter).

Friends' attitudes toward substance use were measured with three items, asking how wrong it is for someone your age to smoke cigarettes, drink alcohol, and use marijuana. Information about attitudes toward rule breaking behaviors other than substance use was not available. Friends were considered to be 'highly tolerant' if they scored one standard deviation or more above the mean and 'low tolerant' if they scored the minimum value; 14.7 percent of the nominated friends was considered to be highly tolerant, 35.4 percent moderately tolerant, and 49.8 percent low tolerant (Table 7C.1 in the Appendix of this chapter).

The *age difference* measures expressed three-, six-, nine- and twelve-month age differences between respondents and their nominated friends, specified for whether the friends were older or younger than the respondent. Age differences were relatively small, because the nominations were within-grade: The mean difference was five months (SD = four months). On average, 28.8 percent of the nominated friends was more than 3 months older than

the respondent, 15.4 was percent more than 6 months older, 6.9 percent was more than 9 months older, and 2.8 percent was more than twelve months older than the respondent (Table 7C.1 in the Appendix of this chapter).

Control variables included background characteristics and general friendship characteristics. To isolate situational effects (of spending time with certain friends under specified conditions) from prior socialization effects of having delinquent friends, we controlled for the *proportion of reciprocal friends that was delinquent*³⁸. Reciprocity of a nomination (whether the nominated friend also nominated the respondent) is one measure of friendship quality. Adolescents may be more likely to adapt their behavior to that of their very close friends (Megens and Weerman, 2010; Urberg et al., 2003).

Several other controls were also included. Dummy variables indicated gender (1 = male), ethnicity (1 = white), whether the respondent was eligible for free reduced price lunch (1 = yes) and whether the respondent lived with two parents, including stepparents (1 = yes). *Grades* represented respondents' general grades, varying from mostly D's (1) to mostly A's (5). *Parental knowledge* was the mean of two items on perceived parental knowledge about respondents' whereabouts and who they are with, rated on a scale of never (1) to always (5). Two variables were included to control for respondents' susceptibility to peer pressure: Their willingness to act different and their perceived social rewards from substance use. *Willingness to act different* was the mean of three items on how likely it is that the respondent would, for example, "express an opinion even though others may disagree with you", rated from definitely would (1) to definitely would not (5). *Perceived social rewards from substance use* was the mean of eleven items about substance use, such as "smoking cigarettes makes you look cool". Answer categories ranged from strongly disagree (1) to strongly agree (5). *Number of friends* was a count of the number of the respondents' friends who were matched to the school roster. Other control variables, namely respondents' risk-seeking tendencies and attitudes, were constructed in a similar manner as the variables representing friends' characteristics. An overview of all items is

³⁸ We also constructed several alternative measures including the proportion of best and stable friends that were delinquent; the proportion of delinquent friends that reciprocated the friendship nomination or were best or stable friends; and the proportion of all nominated friends that were delinquent as well as best, stable, or reciprocal friends. Bivariate correlations indicated that of all examined measures, the control variable we used in the main analyses was the strongest predictor of each dependent variable, and thus offered the most conservative control.

given in Appendix 7A at the end of this chapter. Descriptive statistics for the control variables are presented in Table 7.1.

Analytical strategy

Two-level random intercept models (time within individual) were estimated to examine within-individual changes in delinquency and substance use over time while ‘controlling’ for not only measured time varying individual characteristics, but also measured and unmeasured time stable individual characteristics. Following the hybrid approach suggested by Allison (2009), the models include as predictors two versions of each independent variable: One expresses the person-mean across all waves, and the other expresses the wave specific deviations from that person-mean. We included a set of dummy variables for waves to control for age related change in the outcomes. To account for the skewed distribution of the dependent variables, negative binomial models were estimated. We do not expect multicollinearity to bias the models. The average VIF’s varied between 1.20 and 1.33; the highest VIF was 1.92.

Findings

Who are the friends they hang out with?

On average, respondents engaged in unstructured socializing with their friends almost every week. Table 7.2 presents descriptive statistics for the average measures of unstructured socializing (see Appendix 7B for a discussion about the the average and the square root measures). As shown in Table 7.2, the mean score on unstructured socializing (unspecified for friend characteristics) was 1.951; a score of 2 on the measure represents “once a week”. The descriptive statistics in the Table further indicate that respondents generally spent more time in unstructured socializing with their non-delinquent friends (mean = 1.674) than with their delinquent friends (mean = 1.577; a Wilcoxon signed ranks test³⁹ indicated that the difference was

³⁹ The Wilcoxon signed rank test is a nonparametric test to compare two means from the same respondent.

significant, $Z = -13.353, p < .01$). We also found this for friends' substance use, theft, vandalism and violence. The characteristics of the friends with whom respondents most often engaged in unstructured socializing were similar to the characteristics of the nominated friends overall: The proportion of nominated non-delinquent friends exceeded the proportion of nominated delinquent friends for all types of delinquency (Table 7.2). For the subsamples of respondents with 'mixed' friends (who had delinquent as well as non-delinquent friends), the pattern was less pronounced or even reversed. As shown in Table 7D.2 in the Appendix of this chapter, the subsample of respondents with delinquent as well as non-delinquent friends spent slightly more time unstructured socializing with delinquent friends (mean = 1.913) than with non-delinquent friends (mean = 1.893; Wilcoxon Z for difference = -2.643, $p < .01$).

Table 7.2. Involvement in unstructured socializing with different friends ($N_{\max} = 40,582$ person-observations)

	Proportion of friends ^a	Mean	(SD)	Wilcoxon signed rank test ^c
Unstructured socializing ^b		1.951	(1.249)	
with delinquent friends	42.933	1.577	(1.418)	
with non-delinquent friends	57.067	1.674	(1.368)	-13.353**
with substance using friends	18.111	.889	(1.332)	
with non-substance using friends	81.889	1.858	(1.293)	-104.540**
with friends who steal	21.899	1.104	(1.410)	
with friends who do not steal	78.101	1.860	(1.294)	-87.210**
with vandalizing friends	17.165	.942	(1.369)	
with non-vandalizing friends	82.835	1.889	(1.277)	-104.675**
with violent friends	22.898	1.127	(1.428)	
with non-violent friends	77.102	1.859	(1.295)	-86.402**

NOTES: The means and standard deviations presented in this Table differ from those in Table 7.1 and Table 7C.1 (in the Appendix), because the measures presented in this Table were constructed by dividing the time spent unstructured socializing by the number of friends (average measure), whereas the measures presented in Tables 7.1 and 7C.1 were constructed by dividing by the squared root of the number of friends (squared root measures). The measures in this Table only serve to give the reader an idea of the involvement of respondents in unstructured socializing with different types of friends; they are not included in the analyses.

ABBREVIATION: SD = standard deviation.

^aProportion of nominated peers characterized by this feature.

^bAverage measure to facilitate interpretation (instead of the squared root measure that was used for the analyses).

^cResults of Wilcoxon signed rank tests comparing two means: Unstructured socializing with delinquent friends and with non-delinquent friends.

+ $p < .10$; * $p < .05$; ** $p < .01$ (two-tailed).

In summary, although we found that respondents spent more time unstructured socializing with some friends than with others, we did not find that they necessarily 'hung out with the wrong crowd'. On the contrary, respondents appeared to hang out more often with non-delinquent friends than with delinquent friends. These findings are in line with those of Siennick and Osgood (2012), who reported that the riskiest friends are not the most common unstructured socializing companions.

Unstructured socializing and delinquency

Table 7.3 presents the general relationship between unstructured socializing with friends and the outcome measures, without specification for friend characteristics. The findings indicate positive relationships between unstructured socializing and all investigated types of delinquency except violence. An increase of one unit in unstructured socializing was associated with increases of 1.1 percent in general delinquency ($B = .011, p < .05, IRR = 1.011$), 1.8 percent in substance use ($B = .018, p < .05, IRR = 1.018$), 2.3 percent in theft ($B = .022, p < .01, IRR = 1.023$), and 1.8 percent in vandalism ($B = .017, p < .10, IRR = 1.018$) compared to respondents' usual activity patterns⁴⁰. Although these effects seem modest, we want to stress that the models control for all measured and unmeasured time stable individual characteristics and several measured time varying individual characteristics (e.g., parental knowledge, risk-seeking, susceptibility to peer influence), and also take into account prior socialization effects from delinquent friends. The increased involvement in delinquency is therefore attributable solely to changes in involvement in unstructured socializing.

40 Coefficients were interpreted as log linear and express the change in the log count of the outcome associated with every one-unit increase in the independent variable. The incidence rate ratios (IRR) express the multiplicative change in the outcome measure with every one-unit increase in the predictors.

Table 7.3. General delinquency, substance use, theft, vandalism and violence regressed on overall unstructured socializing ($N_{max} = 11,089$ persons, 40,582 observations)

	General delinquency		Substance use		Theft		Vandalism		Violence	
	B	(SE)	B	(SE)	B	(SE)	B	(SE)	B	(SE)
Unstructured socializing	.011*	(.005)	.018*	(.008)	.022**	(.008)	.017+	(.009)	.002	(.007)
Controls										
Prop. reciprocal delinquent ^a friends	.439**	(.023)	.938**	(.038)	.536**	(.037)	.336**	(.044)	.395**	(.035)
Gender	.285**	(.022)	-.191**	(.033)	.242**	(.033)	.393**	(.037)	.720**	(.033)
Ethnicity	-.170**	(.028)	-.026	(.042)	-.210**	(.042)	-.086+	(.048)	-.285**	(.041)
Free lunch	.126**	(.022)	-.005	(.035)	.142**	(.034)	.006	(.039)	.288**	(.032)
Grades	-.140**	(.011)	-.130**	(.017)	-.052**	(.017)	-.065**	(.018)	-.147**	(.016)
Two parent family	-.142**	(.024)	-.194**	(.035)	-.110**	(.036)	-.148**	(.040)	-.165**	(.035)
Parental knowledge	-.369**	(.012)	-.281**	(.018)	-.380**	(.018)	-.413**	(.019)	-.273**	(.017)
Number of nominated friends	-.004	(.005)	-.020*	(.009)	.000	(.008)	-.019*	(.009)	-.010	(.008)
Risk-seeking	.359**	(.010)	.264**	(.015)	.344**	(.015)	.478**	(.016)	.362**	(.014)
Attitudes toward substance use	.306**	(.013)	.603**	(.019)	.363**	(.020)	.316**	(.022)	.175**	(.020)
Willingness to act different	-.020+	(.012)	.070**	(.019)	-.035+	(.018)	-.019	(.020)	-.050**	(.017)
Perc. social rewards from subst. use	.254**	(.014)	.552**	(.020)	.342**	(.020)	.354**	(.023)	.136**	(.021)
Wave 2 (dummy)	-.032	(.025)	-.595**	(.053)	-.164**	(.041)	-.041	(.047)	.279**	(.035)
Wave 3 (dummy)	-.007	(.022)	-.362**	(.038)	-.022	(.033)	.095*	(.038)	.166**	(.032)
Wave 4 (dummy)	.050*	(.020)	-.086**	(.031)	.107**	(.031)	.201**	(.035)	.013	(.032)
Wave 5 (dummy) ref										
Intercept	-.367**	(.052)	-1.153**	(.087)	-.944**	(.079)	-.602**	(.104)	-.052	(.102)
N persons	10,143		10,201		10,188		10,194		10,205	
N observations	29,119		29,643		29,561		29,675		29,723	
Log likelihood	-40632.67		-16149.86		-23024.02		-14984.63		-19125.23	
AIC	81305.34		32339.71		46088.03		30009.26		38290.46	
BIC	81470.97		32505.65		46253.92		30175.22		38456.45	

NOTES: Results are from random intercept panel models; only unstructured socializing results at the within-individual level are shown.
 ABBREVIATIONS: SE = standard error; Prop. = proportion; perc. = perceived; subst. = substance; ref. = reference category; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion.
^aDelinquency of friends matches the dependent variable.
 +p < .10; *p < .05; **p < .01 (two-tailed).

Unstructured socializing with delinquent friends

In line with Hypothesis 1, we found that unstructured socializing with delinquent friends was more strongly related to delinquency than unstructured socializing with non-delinquent friends. Findings in Table 7.4 indicate that an increase of one unit in unstructured socializing with delinquent friends was associated with an increase of 2.9 percent in delinquency ($B = .029, p < .01, IRR = 1.029$), whereas an increase of one unit in unstructured socializing with non-delinquent friends was associated with a decrease of 1.2 percent in delinquency ($B = -.012, p < .05, IRR = 0.988$). The Wald test indicates that the coefficient for 'unstructured socializing with delinquent friends' was significantly different from the coefficient for 'unstructured socializing with non-delinquent friends' ($\chi^2 = 21.43, p < .01$).

The findings shown in Table 7.5 indicate that the regularity of friends' engagement in delinquency is relevant, and thus support the distinctions between unstructured socializing with medium and high frequency offenders. This model indicates that unstructured socializing with non-delinquent friends was not significantly related to delinquency ($B = -.007, p > .10, IRR = .993$). Unstructured socializing with medium frequent offending friends ($B = .012, p < .05, IRR = 1.012$) as well as with high frequent offending friends ($B = .037, p < .01, IRR = 1.038$) was associated with increased delinquency, but the effect of unstructured socializing with high frequent offending friends was stronger (Wald test: $\chi^2 = 10.55, p < .01$).

Friends' substance use, theft, vandalism and violence

Contrary to Hypothesis 2, we found that unstructured socializing with delinquent friends was more strongly positive related to delinquency *regardless of the type of delinquency*. Results in Table 7.4 indicate that a one unit increase in unstructured socializing with substance using friends, stealing friends, vandalizing friends and violent friends was related to, respectively, increases of 7.9 percent in substance use ($B = .076, p < .01, IRR = 1.079$), 3.6 percent in theft ($B = .035, p < .01, IRR = 1.036$), 5.5 percent in vandalism ($B = .053, p < .01, IRR = 1.055$) and 2.7 percent in violence ($B = .027, p < .01, IRR = 1.027$), compared to respondents' usual activity patterns. On the other hand, we found that unstructured socializing with friends who did not engage in those types of delinquency was unrelated

to theft, vandalism and violence, and even negatively related to substance use ($B = -.032$, $p < .01$, $IRR = .969$). Wald tests confirmed that for all investigated types of delinquency, the unstructured socializing-delinquency relationship was different depending on friends' type-specific delinquent behavior. Furthermore, we found that for all types of delinquency, unstructured socializing with high frequent offending friends was more strongly related to type-specific delinquency than unstructured socializing with medium frequent offending friends or non-delinquent friends (Table 7.5). However, note that for vandalism the coefficient of 'unstructured socializing with high frequent vandalizing friends' ($B = .053$, $p < .01$, $IRR = 1.054$) was higher, but not significantly different from that of 'unstructured socializing with medium frequent vandalizing friends' ($B = .034$, $p < .01$, $IRR = 1.034$, Wald test: $\chi^2 = 1.54$, $p > .01$).

Friends' risk-seeking, attitudes and age

Our findings did not offer support for Hypotheses 3, 4 and 5, regarding respectively the role of friends' risk-seeking tendencies, attitudes and age. Results for these tests are summarized here and presented in full in Table 7E.1 in the supplementary material.

There was some indication that unstructured socializing with moderately risk-seeking friends was more strongly positive related to substance use and theft than unstructured socializing with low or high risk-seeking friends (Model 1 in Table 7E.1). Although similar patterns were visible in the supplemental analyses, Wald tests indicated that the coefficients for unstructured socializing with moderately risk-seeking friends did not differ significantly from those for unstructured socializing with high risk-seeking friends.

For the role of friends' attitudes in the unstructured socializing-delinquency relationship, we found that patterns were not consistent across outcome measures and supplementary analyses (Model 2 in Table 7E.1). This is possibly due to our measure, which specified tolerance toward substance use and no other rule breaking behaviors.

Nor did we find consistent patterns or a clear 'tipping point' for the role of age differences within the unstructured socializing-delinquency relationship (Models 3-6 in Table 7E.1 in the supplementary material). We would expect that if age differences affected the relationship, the effect would become stronger as the age gap increased. There were no such patterns visible in the data.

Table 7.4. General delinquency, substance use, theft, vandalism and violence regressed on unstructured socializing with delinquent and non-delinquent friends ($N_{\max} = 11,089$ persons, 40,582 observations)

	General delinquency		Substance use		Theft		Vandalism		Violence	
	B	(SE)	B	(SE)	B	(SE)	B	(SE)	B	(SE)
Unstructured socializing with										
non-delinquent ^a friends	-.012*	(.006)	-.032**	(.009)	.005	(.008)	-.006	(.009)	.003	(.008)
delinquent ^a friends	.029**	(.006)	.076**	(.010)	.035**	(.010)	.053**	(.011)	.027**	(.009)
Wald test	21.43**		61.75**		5.00*		14.27**		3.45+	
Controls										
Prop. reciprocal delinquent ^a friends	.221**	(.023)	.521**	(.051)	.282**	(.047)	.056	(.057)	.167**	(.044)
Gender	.221**	(.023)	-.203**	(.033)	.196**	(.033)	.337**	(.038)	.602**	(.034)
Ethnicity	-.145**	(.028)	-.011	(.042)	-.171**	(.042)	-.073	(.048)	-.250**	(.041)
Free lunch	.107**	(.022)	-.016	(.035)	.133**	(.034)	-.002	(.038)	.255**	(.032)
Grades	-.122**	(.011)	-.116**	(.017)	-.037*	(.017)	-.056**	(.018)	-.125**	(.016)
Two parent family	-.122**	(.024)	-.181**	(.035)	-.091*	(.036)	-.130**	(.040)	-.135**	(.035)
Parental knowledge	-.365**	(.012)	-.275**	(.018)	-.374**	(.017)	-.410**	(.019)	-.267**	(.017)
Number of nominated friends	-.005	(.005)	-.027**	(.009)	-.006	(.008)	-.026**	(.009)	-.018*	(.008)
Risk-seeking	.352**	(.010)	.263**	(.015)	.341**	(.015)	.472**	(.016)	.353**	(.014)
Attitudes toward substance use	.296**	(.013)	.585**	(.019)	.350**	(.020)	.306**	(.022)	.162**	(.020)
Willingness to act different	-.021+	(.012)	.064**	(.019)	-.033+	(.018)	-.020	(.020)	-.051**	(.017)
Perc. social rewards from subst. use	.252**	(.014)	.531**	(.020)	.338**	(.020)	.346**	(.022)	.132**	(.021)
Wave 2 (dummy)	-.051*	(.025)	-.585**	(.053)	-.177**	(.041)	-.035	(.047)	.257**	(.035)
Wave 3 (dummy)	-.020	(.021)	-.369**	(.038)	-.036	(.033)	.083*	(.038)	-.157**	(.032)
Wave 4 (dummy)	.045*	(.020)	-.110**	(.031)	.099**	(.031)	.193**	(.035)	.012	(.032)
Wave 5 (dummy) ref										
Intercept	-.352**	(.051)	-1.051**	(.087)	-.974**	(.077)	-.567**	(.104)	.005	(.102)

Continuation of Table 7.4

	General delinquency		Substance use		Theft		Vandalism		Violence	
	B	(SE)	B	(SE)	B	(SE)	B	(SE)	B	(SE)
N persons	10,145		10,203		10,191		10,198		10,209	
N observations	29,220		29,665		29,584		29,700		29,748	
Log likelihood	-40504.97		-16058.51		-22952.13		-14938.73		-19042.38	
AIC	81053.93		32161.02		45948.27		29921.47		38128.75	
BIC	81236.15		32343.57		46130.76		30104.04		38311.36	

NOTES: Results are from random intercept panel models; only unstructured socializing results at the within-individual level are shown. ABBREVIATIONS: SE = standard error; Prop. = proportion; perc. = perceived; subst. = substance; ref. = reference category; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion.

^aDelinquency of friends matches the dependent variable.
 +p < .10; *p < .05; **p < .01 (two-tailed).

Table 7.5. General delinquency, substance use, theft, vandalism and violence regressed on unstructured socializing with friends with varied levels of involvement in delinquency ($N_{\max} = 11,089$ persons, 40,582 observations)

	General delinquency		Substance use		Theft		Vandalism		Violence	
	B	(SE)	B	(SE)	B	(SE)	B	(SE)	B	(SE)
Unstructured socializing with										
non-delinquent ^a friends	-.007	(.006)	-.026**	(.009)	.007	(.008)	-.004	(.009)	.004	(.008)
medium frequent delinquent ^a friends	.012*	(.006)	.027*	(.011)	-.017	(.011)	.034**	(.012)	.010	(.009)
high frequent delinquent ^a friends	.037**	(.006)	.079**	(.010)	.051**	(.010)	.053**	(.012)	.037**	(.010)
Wald test low-mid	4.85*		12.94**		2.77 +		5.37*		.20	
Wald test low-high	29.14**		62.29**		11.02**		12.94**		6.57*	
Wald test mid-high	10.55**		13.70**		24.60**		1.54		4.81*	
Controls										
Prop. reciprocal delinquent ^a friends	.235**	(.029)	.533**	(.050)	.287**	(.047)	.065	(.056)	.165**	(.044)
Gender	.221**	(.023)	-.198**	(.033)	.193**	(.033)	.334**	(.038)	.603**	(.034)
Ethnicity	-.135**	(.028)	-.011	(.042)	-.167**	(.042)	-.071	(.048)	-.248**	(.041)
Free lunch	.108**	(.022)	-.007	(.035)	.135**	(.034)	-.004	(.038)	.259**	(.032)
Grades	-.117**	(.011)	-.116**	(.017)	-.033*	(.017)	-.054**	(.018)	-.124**	(.016)
Two parent family	-.120**	(.023)	-.188**	(.035)	-.089*	(.036)	-.128**	(.040)	-.135**	(.035)
Parental knowledge	-.364**	(.012)	-.274**	(.018)	-.372**	(.017)	-.410**	(.019)	-.267**	(.017)
Number of nominated friends	-.009	(.005)	-.031**	(.009)	-.008	(.008)	-.028**	(.009)	-.022**	(.008)
Risk-seeking	.352**	(.010)	.265**	(.015)	.343**	(.015)	.470**	(.016)	.353**	(.014)
Attitudes toward substance use	.292**	(.013)	.582**	(.019)	.349**	(.020)	.304**	(.022)	.161**	(.020)
Willingness to act different	-.022+	(.012)	.063**	(.019)	-.034+	(.018)	-.020	(.020)	-.051**	(.017)
Perc. social rewards from subst. use	.246**	(.014)	.529**	(.020)	.332**	(.020)	.344**	(.022)	.132**	(.021)
Wave 2 (dummy)	-.047+	(.025)	-.580**	(.053)	-.170**	(.041)	-.033	(.047)	.255**	(.035)
Wave 3 (dummy)	-.014	(.021)	-.361**	(.039)	-.025	(.033)	.085*	(.038)	.159**	(.032)
Wave 4 (dummy)	.043*	(.020)	-.105**	(.031)	.098**	(.030)	.192**	(.035)	.013	(.032)
Wave 5 (dummy) ref										
Intercept	-.362**	(.050)	-1.033**	(.087)	-.971**	(.077)	-.562**	(.104)	.008	(.102)

Continuation of Table 7.5

	General delinquency		Substance use		Theft		Vandalism		Violence	
	B	(SE)	B	(SE)	B	(SE)	B	(SE)	B	(SE)
N persons	10,145		10,203		10,191		10,198		10,209	
N observations	29,220		29,665		29,584		29,700		29,748	
Log likelihood	-40479.30		-16054.48		-22931.19		-14936.84		-19037.39	
AIC	81006.61		32156.96		45910.39		29921.68		38122.78	
BIC	81205.39		32356.10		46109.47		30120.85		38321.99	

NOTES: Results are from random intercept panel models; only unstructured socializing results at the within-individual level are shown. ABBREVIATIONS: SE = standard error; Prop. = proportion; perc. = substance; subst. = perceived; subst. = substance; ref. = reference category; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion.

^aDelinquency of friends matches the dependent variable.

+p < .10; *p < .05; **p < .01 (two-tailed).

Supplementary analyses

The analyses presented above used a measure of unstructured socializing that was constructed by dividing by the square root of the number of friends (the square root measure). Additional analyses were conducted with an alternative measure constructed by simply dividing by the number of friends (the average measure). Results of these analyses, presented in Table 7F.1 in the supplementary material, were essentially similar to those from the main analyses: They confirmed relationships between unstructured socializing and the outcome measures (except for violence) that were amplified by the presence of type-specific delinquent friends. One noteworthy difference was that unstructured socializing with ‘non-stealing’ friends was more strongly positively related to theft than unstructured socializing with friends who committed theft (Model 2 in Table 7F.1 in the supplementary material).

Furthermore, all models were re-estimated for subsamples of respondents with mixed groups of friends. This check was conducted as a conservative control for potential selection effects that arise if friendship selection in the past is predictive of involvement in unstructured socializing in the present. It is, for example, possible that adolescents with many delinquent friends more often engage in unstructured socializing. Brief descriptions of the subsamples are shown in Tables 7D.1 and 7D.2 in Appendix at the end of this chapter. The descriptive statistics in Table 7D.1 indicate for example that, of the total sample ($N = 40,582$ person-observations), 11.7 percent solely nominated delinquent friends, 19.7 percent solely nominated non-delinquent friends, and the other 68.7 percent (27,876 person-observations) nominated delinquent as well as non-delinquent friends. The subsample for the analyses on ‘unstructured socializing with delinquent friends’ therefore consists of 22,876 person-observations. Findings of these analyses, as presented in Table 7G.1 in the supplementary material, were similar to those from the main analyses, in that unstructured socializing with type-specific delinquent friends was more strongly related to delinquency than unstructured socializing with other friends—except for violence. Patterns for medium and high frequent offending friends were less clear. For these subsamples, the general relationship between unstructured socializing (unspecified for friends) and delinquency was confirmed for theft and vandalism, but not for substance use and violence.

Discussion and conclusion

Adolescents spend a lot of their time with peers (Anderson, 2013; Larson and Verma, 1999) and time spent with peers may, under certain conditions, increase the risk for delinquency and substance use (Osgood et al., 1996; Weerman et al., 2013). It is therefore important to scrutinize what these conditions are. The current study focused on whose presence in situations of unstructured socializing increased the risk for delinquency. Of the four investigated friend characteristics, friends' involvement in delinquency appeared to be most relevant. Unstructured socializing with delinquent friends was more strongly positively related to delinquency than unstructured socializing with non-delinquent friends, especially if the friends engaged in delinquency frequently (i.e., if they were in the top ten percent of offending frequency). These findings were consistent across different types of delinquency, namely theft, substance use, vandalism and violence. Results for other friend characteristics (friends' risk-seeking tendencies, attitudes toward substance use, and relative ages) were ambiguous.

These findings provide tentative support for the idea that the behavior of friends ('what they do') is more predictive of adolescents' delinquency than the attitudes of friends ('what they think') when it comes to *situational influence*. Friends' delinquency seemed highly relevant, and even more so when we specified friends' frequency of engaging in delinquency or their type-specific delinquency. This is in contrast with recent findings on *socialization*, which indicated that peers' attitudes may be more important than peers' behavior in the process of learning attitudes favorable of delinquency (Megens and Weerman, 2012; Ragan, 2014).

A more theoretical contribution of our study is the integration of literature from different disciplines on peer influence, co-offending, and conflict situations to specify four situational processes through which adolescents might contribute to each other's delinquency. We argued that peers can motivate adolescents to commit delinquent acts by providing positive reinforcement for such behavior, by instigating a delinquent act, by provoking delinquent behavior through threatening one's status, and by merely being present and thereby providing a delinquency conducive group setting. These theoretical processes were used to derive hypotheses about relevant friend characteristics, although we could not test the

processes directly. Our finding that violence was not related to unstructured socializing (which is in line with findings from Müller, Eisner, and Ribeaud, 2013, and Mustaine and Tewksbury, 2000) may indicate that, among our sample of public secondary school students from Pennsylvania and Iowa, provocation is a less important process. Nevertheless, this is speculation, and further research is necessary to determine whether the investigated friend characteristics indeed make friends more likely to exert these or other types of situational influence.

The current study contributes to the discussion about whether the unstructured socializing-delinquency relationship exists independently from the socialization effect of having delinquent friends. Haynie and Osgood (2005) did not find evidence for an interaction effect between involvement in unstructured socializing and having delinquent peers, which strengthened their perspective of unstructured socializing as an ‘opportunity’ concept. Other studies found positive interactions and argued that the relationship between unstructured socializing and delinquency was merely explained by association with delinquent peers (Bernburg and Thorlindsson, 2001; Svensson and Oberwittler, 2010; Thorlindsson and Bernburg, 2006). The findings of the current study imply that it indeed matters who is present in a situation of unstructured socializing. However, in line with Osgood et al. (1996), we take a situational perspective in which we view the present peers as motivators and facilitators of *opportunities* for delinquency, not solely as agents of socialization. Thus, we argue that unstructured socializing is more strongly related to delinquency if delinquent friends are present, because of the deviant nature of the peer or group processes that are shaped by the presence of these friends. The current study can be considered as a first step toward specifying the characteristics of friends that contribute to increased situational influence toward delinquency. This area has thus far been understudied (Brechtwald and Prinstein, 2011: 173).

Limitations and future research

The sociometric features of the PROSPER data linked with respondents’ reports about unstructured socializing with each nominated friend make the data exceptionally well-suited for studying characteristics of the peers

present in situations of unstructured socializing. Nevertheless, the data have some limitations that will be addressed in this section.

One limitation was the absence of information about conditions under which delinquent acts occurred. Specifically, it was unknown whether the delinquency reported by respondents actually occurred in situations of unstructured socializing. Our findings therefore only concern the general risk for adolescents' involvement in delinquency that is associated with the time they spend unstructured socializing with certain friends.

A second limitation was that the data only captured information about unstructured socializing with 'best' or 'close' friends, not with distant friends or acquaintances. Respondents' involvement in unstructured socializing may therefore be underestimated. This is particularly problematic if delinquent adolescents, compared to non-delinquent adolescents, spend more time in unstructured socializing with peers who are not friends, or if unstructured socializing with distant friends is more strongly related to delinquency than unstructured socializing with close friends. Future research has to determine whether that is the case. Relatedly, we know little of the group structures or other peers that were present in situations of unstructured socializing. Respondents may hang out with just the one friend the question refers to. If they do not, we do not know who else is present in that situation. It would be interesting to study the group size and group composition with respect to, for example, age differences within the group, differences in delinquency experience, gender composition (see Lam, McHale, and Crouter, 2014), and the nature of the friendships within the group.

A methodological challenge in the study was to isolate situational influences as much as possible from socialization and selection effects. We therefore not only applied a within-individual design to extensively control for individual characteristics of the respondents, but we also conducted supplementary analyses with subsamples to control for the effects of simply having certain friends. Even so, the isolation of situational influences is not an easy task and our understanding of the proposed situational peer processes would benefit from replication in experimental designs (such as that of Dishion et al., 1996; Gardner and Steinberg, 2005; Paternoster et al., 2013).

Concluding remarks

The current study takes the setting of unstructured socializing as a point of departure in studying short-term situational peer processes. Nevertheless, scholars need to take into account long-term effects of situational processes as well. The more often individuals are exposed to certain situations, the more likely it is that those situations will affect their moral values system. Therefore, *situational* influences may result in *socialization*.

We repeat here the arguments of Warr (2002), who stated that group dynamic explanations for the relationship between delinquent peers and delinquency cannot be interpreted separately from selection and socialization explanations. Adolescents select friends with certain characteristics and then are socialized by them in a chain of situations: They learn from the physically present peers what acceptable behavior is and is not. Socialization by peers thus cannot be viewed independently from the situations in which adolescents encounter these peers and from who else is present. Barker (1968) argued that individuals are not only influenced by a situation, but that they also are part of that situation and its ecological sphere of influence. This view on socialization and situational peer influence has often been neglected in sociology and deserves more attention.

Appendices Chapter Seven

- Appendix 7A: Items representing each construct
- Appendix 7B: Operationalization of unstructured socializing
- Appendix 7C: Descriptive statistics for other friend characteristics
- Appendix 7D: Descriptive statistics for subsamples

Supplementary material

(enclosed in a separate document available from the author):

- Appendix 7E: Results for friends' risk-seeking, attitudes and age differences
- Appendix 7F: Results using averaged measures of unstructured socializing
- Appendix 7G: Results for subsamples

Appendix 7A

Table 7A.1. Items representing each construct

Variable	Number of items	Items
Delinquency	12	Stealing something worth less than 25 US dollars; stealing something worth more than 25 US dollars; beating up someone or physically fighting with someone because they made the respondent angry; purposely damaging or destroying property that did not belong to them; breaking into or trying to break into a building just for fun; throwing objects such as rocks or bottles at people to hurt or scare them; being picked up by the police for breaking the law; running away from home; skipping school or classes without excuse; carrying a hidden weapon; avoiding paying for things such as movies, rides, food or computer services; taking something from a store without paying. <i>For the past twelve months: Never (0); once (1); twice (2); three or four times (3); five or more times (4).</i>
Theft	4	Stealing something worth less than 25 US dollars; stealing something worth more than 25 US dollars; avoiding paying for things such as movies, rides, food or computer services; taking something from a store without paying. <i>For the past twelve months: Never (0); once (1); twice (2); three or four times (3); five or more times (4).</i>
Vandalism	2	Purposely damaging or destroying property that did not belong to them; breaking into or trying to break into a building just for fun. <i>For the past twelve months: Never (0); once (1); twice (2); three or four times (3); five or more times (4).</i>
Violence	1	Beating up someone or physically fighting with someone because they made the respondent angry. <i>For the past twelve months: Never (0); once (1); twice (2); three or four times (3); five or more times (4).</i>
Substance use	4	Being drunk; smoking marijuana; using inhalants to get high; using methamphetamines. <i>For the past twelve months: Not at all (0), one or two times (1); three to six times (2); seven to twelve times (3) and more than twelve times (4).</i>
Parental knowledge	2	During the day, my parents know where I am. My parents know who I am with when I am away from home. 'Never' (1) to 'always' (5).
Risk-seeking	3	How often the respondents 'do what feels good, regardless of the consequences', 'do something dangerous because someone dares them to do it', and 'do crazy things just to see the effect on others'. 'Never' (1) to 'always' (5).
Attitudes toward substance use	3	How wrong it is for someone the respondents' age to 'smoke cigarettes', 'drink alcohol' and 'use marijuana'. 'Very wrong' (1) to 'not at all wrong' (4).
Willingness to act different	3	How likely the respondents thought they would 'express an opinion even though others may disagree with them', 'ask a teacher to explain something they don't understand', and 'say "no" when someone asks them to do something they don't want to do'. 'Definitely would' (1) to 'definitely would not' (5).
Perceived social rewards from substance use	11	Respondents were asked to what extent they agreed to statements about substance use. The statements on smoking were: 'Kids/teens who smoke have more friends,' 'smoking cigarettes makes you look cool' and 'smoking cigarettes lets you have more fun'. The same statements were made about smoking marijuana and alcohol use. Additional items on alcohol use were: 'Drinking alcohol is a good way of dealing with your problems', 'Drinking helps you get along with other people'. 'Strongly disagree' (1) to 'strongly agree' (5).

Appendix 7B

Operationalization of unstructured socializing

Involvement in unstructured socializing was measured by asking the respondent for each nominated friend, 'How often do you spend time just hanging out with this person outside of school (without adults around)?' Answer categories were never (0); once or twice a month (1); once a week (2); a few times a week (3); almost every day (4). These responses were summed across respondents' friends and divided by the square root of the number of those friends (range 1 to 7), following the approach taken by Haynie and Osgood (2005).

Haynie and Osgood (2005, footnote 8) argued that taking the sum of the unstructured socializing responses across friends would be inappropriate, because the measure would be too strongly correlated with the number of friends, and that taking the average across friends (dividing by the number of friends) requires the unreasonable assumption that respondents with many friends are not more often involved in unstructured socializing than respondents with few friends. Bivariate correlations indicated a pattern in line with this: The summative measure of unstructured socializing was most strongly correlated with the number of nominated friends (.413), the average measure was least strongly and negatively correlated with the number of nominated friends (-.062), and the strength of the correlation between the square root measure and the number of peers fell in between the first two correlations (.225). All models therefore controlled for the number of nominated friends. When correlating the different unstructured socializing measures (the sum, average, and square root measures) with the dependent variables (e.g., delinquency), we found that the correlations between the square root measures and the dependent variables were often stronger (more negative or more positive) than the correlations between the average measures and the dependent variables. It seemed that the larger the number of friends was, the larger the differences between these correlations. We therefore replicated all models with average measures instead of square root measures (see Table 7E.1 in the supplementary material). The model fit (based on AIC and BIC values) was almost identical for both measures, but in most cases, the models with the square root measure fitted the data slightly better than the models with the average measure.

Appendix 7C

Table 7C.1. Descriptive statistics for measures of unstructured socializing with friends with various characteristics ($N_{\max} = 40,582$ person-observations)

	Proportion of friends ^a	Mean	(SD)	Min	Max	ICC ^b
Unstructured socializing		3.674	(2.491)	.000	10.580	.355
Friends' delinquency						
with non-delinquent friends	57.067	2.666	(2.309)	.000	10.580	.295
with medium frequent delinquent friends	32.043	1.869	(1.970)	.000	10.580	.243
with high frequent delinquent friends	10.891	.719	(1.417)	.000	9.800	.193
Friends' substance use						
with non-substance using friends	81.889	3.412	(2.540)	.000	10.580	.302
with medium freq. substance using friends	7.312	.550	(1.222)	.000	8.000	.077
with high frequent substance using friends	10.799	.703	(1.428)	.000	8.940	.146
Friends' theft						
with friends who do not steal	78.101	3.326	(2.465)	.000	10.580	.319
with friends who steal medium frequently	7.586	.579	(1.237)	.000	7.500	.075
with friends who steal high frequently	14.314	.950	(1.580)	.000	9.800	.194
Friends' vandalism						
with non-vandalizing friends	82.835	3.463	(2.495)	.000	10.580	.329
with medium frequent vandalizing friends	9.051	.673	(1.331)	.000	8.000	.119
with high frequent vandalizing friends	8.114	.579	(1.274)	.000	8.980	.156
Friends' violence						
with non-violent friends	77.102	3.317	(2.444)	.000	10.580	.338
with medium frequent violent friends	12.135	.862	(1.492)	.000	9.800	.158
with high frequent violent friends	10.763	.748	(1.435)	.000	8.940	.191
Friends' risk-seeking						
with high risk-seeking friends	14.939	.989	(1.580)	.000	8.940	.170
with medium risk-seeking friends	65.578	2.956	(2.270)	.000	10.580	.305
with low risk-seeking friends	19.483	1.178	(1.693)	.000	9.800	.171
Friends' attitudes						
with highly tolerant friends	14.729	.947	(1.599)	.000	10.580	.165
with medium tolerant friends	35.429	2.023	(2.028)	.000	9.800	.225
with low tolerant friends	49.842	2.410	(2.298)	.000	10.580	.223
Age differences						
with older friends (3 months)	28.766	1.553	(2.049)	.000	10.580	.451
with same age friends (3 months)	41.561	2.251	(2.113)	.000	10.580	.351
with younger friends (3 months)	26.970	1.458	(2.033)	.000	10.580	.502
with older friends (6 months)	15.395	.922	(1.650)	.000	10.580	.431
with same age friends (6 months)	67.708	3.082	(2.393)	.000	10.580	.366
with younger friends (6 months)	14.194	.832	(1.636)	.000	10.580	.503
with older friends (9 months)	6.891	.457	(1.192)	.000	9.800	.358
with same age friends (9 months)	84.179	3.533	(2.518)	.000	10.580	.365
with younger friends (9 months)	6.227	.374	(1.157)	.000	10.580	.486
with older friends (12 months)	2.826	.198	(.788)	.000	7.760	.259
with same age friends (12 months)	91.911	3.733	(2.565)	.000	10.580	.364
with younger friends (12 months)	2.560	.146	(.760)	.000	10.580	.503

ABBREVIATIONS: SD = standard deviation; Min = minimum; Max = maximum; ICC = intra-class correlation.
^a Proportion of nominated peers characterized by this feature.

^b The ICCs are calculated in Stata as suggested by Hilbe (2011) and Hosmer and Lemeshow (2000). The ICCs express the percentage of the total variance that is at the individual level (versus the person-observation level).

Appendix 7D

Table 7D.1. Involvement in unstructured socializing for subsamples of respondents, characterized by the variability in their friends' characteristics ($N_{\max} = 40,582$ person-observations)

	N	Percent	Number of friends ^a		Unstructured socializing ^b	
			Mean	(SD)	Mean	(SD)
All	40,582	100.0	4.878	(1.873)	1.951	(1.249)
Respondents with...						
Only delinquent friends	4,728	11.7	3.156	(1.788)	2.235	(1.296)
Only non-delinquent friends	7,978	19.7	3.934	(2.021)	1.880	(1.326)
Only medium frequent delinquent friends	2,121	5.2	2.464	(1.471)	2.201	(1.359)
Only high frequent delinquent friends	727	1.8	2.173	(1.330)	2.456	(1.324)
Mixed friends (dq. and non-dq.)	27,876	68.7	5.443	(1.524)	1.924	(1.211)
Mixed friends (non, medium and high dq.)	7,796	19.2	5.929	(1.158)	1.973	(1.154)
Only substance using friends	1,492	3.7	2.767	(1.640)	2.410	(1.211)
Only non-substance using friends	22,529	55.5	4.597	(1.957)	1.900	(1.301)
Only medium frequent substance using friends	276	.7	1.797	(.916)	2.409	(1.354)
Only high frequent substance using friends	799	2.0	2.478	(1.548)	2.498	(1.195)
Mixed friends (use and non-use)	16,561	40.8	5.451	(1.520)	1.980	(1.168)
Mixed friends (non, medium and high use)	3,818	9.4	5.930	(1.163)	2.005	(1.090)
Only friends who steal	1,413	3.5	2.411	(1.482)	2.366	(1.309)
Only friends who do not steal	17,825	43.9	4.376	(1.980)	1.914	(1.303)
Only friends who steal medium frequently	268	.7	1.694	(.893)	2.363	(1.401)
Only friends who steal high frequently	842	2.1	2.220	(1.405)	2.377	(1.327)
Mixed friends (stealing and not stealing)	21,344	52.6	5.461	(1.516)	1.955	(1.193)
Mixed friends (non, medium and high stealing)	4,762	11.7	6.021	(1.127)	1.952	(1.136)
Only vandalizing delinquent friends	956	2.4	2.159	(1.330)	2.378	(1.367)
Only non-vandalizing delinquent friends	21,228	52.3	4.491	(1.962)	1.911	(1.291)
Only medium frequent vandalizing friends	340	.8	1.703	(.933)	2.371	(1.452)
Only high frequent vandalizing friends	399	1.0	1.837	(1.038)	2.465	(1.327)
Mixed friends (vand. and non-vand.)	18,398	45.3	5.465	(1.517)	1.976	(1.186)
Mixed friends (non, medium and high vand.)	3,735	9.2	5.963	(1.168)	1.999	(1.125)
Only violent delinquent friends	1,515	3.7	2.312	(1.415)	2.298	(1.366)
Only non-violent delinquent friends	17,369	42.8	4.454	(1.992)	1.895	(1.267)
Only medium frequent violent friends	513	1.3	1.776	(1.038)	2.281	(1.437)
Only high frequent violent friends	561	1.4	1.863	(1.051)	2.381	(1.387)
Mixed friends (violent and non-violent)	21,698	53.5	5.397	(1.541)	1.972	(1.221)
Mixed friends (non, medium and high violent)	5,694	14.0	5.936	(1.178)	2.028	(1.206)

ABBREVIATIONS: SD = standard deviation; dq. = delinquent; vand. = vandalizing.

^aNumber of friends who could be matched to the school roster. Note that the average number of friends for the mixed group is substantially higher, because this group only incorporates the respondent who nominated at least two friends (otherwise their nominated friends could not be mixed on particular characteristics).

^bAverage-measure to facilitate interpretation, instead of the squared-root measure that was used for the analyses.

Table 7D.2. Involvement in unstructured socializing with different friends, for subsamples with mixed friends ($N_{\max} = 40,582$ person-observations)

	Proportion of friends ^a	N	Mean	(SD)	Wilcoxon signed rank test ^c	Spearman's rho ^d with type-specific delinquency
Unstructured socializing ^b		40,582	1.951	(1.249)		
with delinquent friends	45.542	27,876	1.913	(1.324)		.146**
with non-delinquent friends	54.458	27,876	1.893	(1.302)	-2.643**	-.019**
with substance using friends	35.371	16,561	1.952	(1.343)		.189**
with non-substance using friends	64.629	16,561	1.961	(1.236)	-2.276*	-.025**
with friends who steal	35.017	21,344	1.938	(1.360)		.119**
with friends who do not steal	64.983	21,344	1.933	(1.249)	-0.371	-.004
with vandalizing friends	32.666	18,398	1.951	(1.372)		.111**
with non-vandalizing friends	67.335	18,398	1.954	(1.237)	-1.919+	.007
with violent friends	35.844	21,698	1.944	(1.380)		.113**
with non-violent friends	64.156	21,698	1.956	(1.275)	-2.599*	.014*

ABBREVIATION: SD = standard deviation.

^aProportion of nominated peers characterized by this feature.

^bAverage measure to facilitate interpretation (instead of the squared root measure that was used for the analyses).

^cResults of Wilcoxon signed rank tests comparing two means: Unstructured socializing with delinquent friends and with non-delinquent friends.

^dCorrelations are calculated with the squared root measures for unstructured socializing.

+ $p < .10$; * $p < .05$; ** $p < .01$ (two-tailed).



Chapter Eight.

Discussion and Conclusion



Discussion and Conclusion

Teenagers have annoyed adults for centuries, with their tendency to group on street corners, laughing, bragging, cursing, and squandering their time in idle ways (Den Heussen, 1657). Such behavior has indeed been shown to be related to undesirable outcomes, such as substance use (Thorlindsson and Bernburg, 2006), vandalism (Miller, 2013), gambling (Moore and Ohtsuka, 2000), shoplifting (Müller, Eisner, and Ribeaud, 2013), conduct problems (McHale, Crouter, and Tucker, 2001; Lam, McHale, and Crouter, 2014), and association with delinquent peers (Dishion, Andrews, and Crosby, 1995; Wong, 2005). In criminology, the relationship between unsupervised hanging out with friends (unstructured socializing) and deviance is generally contextualized within the routine activity theory of general deviance of Osgood et al. (1996), which focuses on the situational nature of delinquency and the concept of unstructured socializing.

The aim of this study was to elaborate on the relationship between unstructured socializing and adolescent delinquency. This aim was pursued by examining underlying processes to *explain* the relationship, applying an innovative data collection method to better empirically *investigate* the relationship, and by studying situational conditions to *specify* the relationship. Data were collected on the time use and deviant behaviors of over 800 Dutch adolescents (aged 11 to 20, derived from the SPAN project) and over 16,000 American adolescents (aged 10 to 17, derived from the PROSPER Peers project). These adolescents were approached through the secondary schools they attended. The two data sources (SPAN and PROSPER) each provided unique information to address specific research questions. The space-time budget data from the SPAN project enabled an improved operationalization of the unstructured socializing concept, as well as insights into the locations where adolescents spent their time in unstructured socializing. The sociometric information from the PROSPER Peers project allowed for the investigation of the friends with whom adolescents were engaged in unstructured socializing. In combining these data sources and integrating

the unstructured socializing perspective with classic criminological theories (e.g., social learning theory, social disorganization theory, and broken windows theory), the current study offers a thorough and detailed exploration into the criminogenic nature of teenagers 'hanging out and messing about'.

In this concluding chapter, I will recapitulate the findings, discuss their implications for theory, methodology and policy and reflect on the limitations of the study and issues that should be addressed in future research.

Involvement in unstructured socializing

The first finding of relevance is that the phenomenon of adolescents hanging out is indeed widespread. About 80 percent of the Dutch adolescents from the SPAN project and about 60 percent of the American adolescents from the PROSPER project engaged in unstructured socializing *on a weekly basis*. The frequency and amount of time they spent in unstructured socializing varied strongly among the respondents: 20 percent of the Dutch respondents and 15 percent of the American respondents did not spend time in unstructured socializing at all in the investigated period, whereas 15 percent of the Dutch adolescents spend more than ten hours in unstructured socializing in the examined week, and 15 percent of the American adolescents reported spending time in unstructured socializing almost every day. These findings are consistent with findings from an international study in 31 countries across Europe, the USA and Latin America (Steketee, 2012) and illustrates the common occurrence and popularity of this leisure activity among adolescents.

About one fourth of all hours spent in unstructured socializing, as reported by the Dutch respondents, was spent on the street. Other popular hangout locations were respondents' homes or friends' homes, entertainment or recreational facilities, and public transportation. Adolescents generally spent their hours of unstructured socializing at locations outside of their own neighborhoods and more often in disorganized and disordered neighborhoods than elsewhere. Data from the American sample suggested that adolescents did not necessarily 'hang out with the wrong crowd'; they generally spent more time in unstructured socializing with their non-delinquent than with their delinquent friends.

Unstructured socializing and adolescent delinquency

Research has repeatedly shown that adolescents' involvement in unstructured socializing is related to their involvement in delinquency (e.g., Haynie and Osgood, 2005; Maimon and Browning, 2010; Osgood et al., 1996). As illustrated by the literature review presented in Chapter 1, the unstructured socializing-delinquency relationship appears to be robust across countries, stages of adolescence, research designs, and types of delinquency. Findings of the current study confirmed that increases in involvement in unstructured socializing were related to increases in general delinquency, substance use, theft, and vandalism. The support for a relationship between unstructured socializing and violence was less extensive, which is consistent with findings from Müller, Eisner, and Ribeaud (2013) and Mustaine and Tewksbury (2000). It has been suggested that most forms of delinquency during adolescence are the result of psychological immaturity and external deviant influences but that more serious forms of delinquency stem from personality features or familial backgrounds (Moffitt, 1993). Therefore, it stands to reason that involvement in unstructured socializing is more predictive of minor forms of delinquency, such as vandalism and substance use, than of violence; unstructured socializing represents a situational factor that explains delinquent behavior with external influences and situational inducements. Despite the results regarding violence, unstructured socializing's relationships with general delinquency, substance use, theft, and vandalism were confirmed in the sample of Dutch adolescents from highly urbanized backgrounds, as well as in the sample of American adolescents from rural Pennsylvania and Iowa.

Why is unstructured socializing related to adolescent delinquency?

One of the studies in this book, presented in Chapter 2, was aimed at theorizing and testing potential underlying processes of the relationship between unstructured socializing and delinquency. The study integrated insights from social learning theory (Akers, 1998; Burgess and Akers, 1966) and situational peer influence approaches (Dishion et al., 1996; Warr, 2002) with the unstructured socializing perspective (Osgood et al., 1996) to formulate four potential explanatory processes. Findings of the empirical examination of these processes suggested that all of the four proposed processes contributed, directly or in sequential paths, to the explanation of the relationship. Involvement in unstructured socializing was found to 1) expose adolescents to temptations (perceived opportunities) to engage in delinquency and 2) to expose adolescents to delinquent peers, which subsequently 3) increased their exposure to delinquent group processes (delinquent reinforcement in particular) and 4) increased their tolerance toward delinquency. This is interesting, because it means that involvement in unstructured socializing has both short-term and long-term effects on delinquency. In the short-term, situations of unstructured socializing evoke temptations (opportunities) for delinquency and expose adolescents to pressure from their peers to engage in delinquency. These processes cease to exist if adolescents leave the unstructured socializing setting. Long-term processes arise because involvement in unstructured socializing evokes increased association with delinquent friends and altering of adolescents' moral values. These processes work long-term in influencing delinquency, because adolescents will bring their friends and altered values to future situations. Previous studies often implied that unstructured socializing, as a predictor of delinquency, mainly represented opportunities and short-term peer influence (e.g., Haynie and Osgood, 2005; Thomas and McGloin, 2013). The current study thus refines our understanding of how involvement in unstructured socializing affects adolescent delinquency. These findings are in line with statements made by Warr (2002) that socialization from peers occurs in a chain of situations: Adolescents learn what acceptable behavior is and what is not from peers' responses in particular situations.

What conditions strengthen or weaken the unstructured socializing-delinquency relationship?

Chapters 5, 6, and 7 each addressed situational conditions that potentially contribute to a crime conducive setting. Chapter 5 was concentrated on the functional locations where adolescents' spend time in unstructured socializing. Chapter 6 was focused on levels of disorganization and disorder in the areas where adolescents spend time in unstructured socializing. Chapter 7 addressed characteristics of the peers with whom adolescents engage in unstructured socializing.

With regard to the functional location (Chapter 5), the expectation was that unstructured socializing would be more strongly related to delinquency if it occurred at locations where social control was low. The extent to which social control is exerted at locations depends on the extent to which people feel responsible for those locations. People generally feel extremely responsible for what happens in their homes (private space) but much less for what happens on the street (public space). One might say that the more people have access to a location, the less they will feel responsible for what happens there. The responsibilities of places classification of Felson (1995; see also Eck, 1994) was integrated with the unstructured socializing perspective to theorize what locations would be specifically crime conducive. In line with the hypotheses, findings of the study indicated that unstructured socializing in private spaces was less strongly related to delinquency than unstructured socializing in semi-public and public spaces. In particular, unstructured socializing in public entertainment facilities, on the streets, and in open spaces was related to increased adolescent delinquency, more so than unstructured socializing in shopping centers, public transportation, and other semi-public settings such as schools and sports clubs. These findings are potentially explained with the supervision exerted by shop owners, employees at facilities for public transportation (e.g., a tram conductor), and employees at the other semi-public settings (e.g., concierge) who are assigned responsibility for a location as their primary job (Felson, 1995). Although this remains speculation, it is possible that such employees interfere if a nearby group of adolescents becomes too rowdy or noisy or when they show signs of initiating deviant behavior.

To assess the criminogenic nature of disorganization and disorder in the areas where adolescents hang out (Chapter 6), the unstructured socializing perspective was integrated with broken windows theory (Wilson and Kelling, 1982) and social disorganization theory (Sampson, Raudenbush, and Earls, 1997; Shaw and McKay, 1942). According to social disorganization theory, disorganization in a neighborhood is the inability or unwillingness of residents to establish social control in their neighborhoods. It follows then that, in neighborhoods with high levels of disorganization, residents are less likely to supervise groups of adolescents who are hanging out in that area. It was theorized that adolescents will, therefore, feel more free to do as they please, which includes participation in delinquent behavior. Similarly, signs of disorder can be viewed as cues that inappropriate behavior is tolerated in that area, that ‘nobody cares’ (Wilson and Kelling, 1982). Signs of disorder thereby provide signals to adolescents hanging out in that area that deviant acts will likely go unpunished. It was therefore hypothesized that unstructured socializing would be more strongly related to delinquency if it occurred in areas with high levels of disorder and disorganization. To examine these hypotheses, seven indicators of social disorganization were investigated (socioeconomic status, ethnic heterogeneity, residential mobility, family disruption, population density, structural density, and collective efficacy), along with an indicator expressing the level of physical disorder. Findings showed that, of all the investigated indicators, collective efficacy in the area was the only one with a robust effect on the unstructured socializing-delinquency relationship. Collective efficacy refers to “social cohesion among neighbors combined with their willingness to intervene on behalf of the common good” (Sampson, Raudenbush, and Earls, 1997: 918). Unstructured socializing in neighborhoods with low levels of collective efficacy was more strongly related to delinquency than unstructured socializing in neighborhoods with high levels of collective efficacy. This implies that when adolescents hang out in neighborhoods where residents are unable or unwilling to exert supervision, such activity is more strongly related to delinquency. In an attempt to disentangle the *situational (exposure) effects* from spending time in low collective efficacy area and the *socialization effects* from residing in such a neighborhood, analyses were conducted that only included the hours spent more than one kilometer away from home. These analyses confirmed the findings described previously.

Results on these first two conditions (functional location and collective efficacy) provide some indirect evidence that the broader environment, as defined by the locations where activities takes place, provides social control over teenagers 'hanging out'. The extent to which people feel responsible for locations (Eck, 1994; Felson, 1995) and the willingness and capability of residents to interfere (Sampson, Raudenbush, and Earls, 1997) both appear to strengthen the social control perceived by adolescents who are engaging in unstructured socializing in the location or area, which affects their involvement in delinquency. The findings do not allow for an understanding of whether the broader environment (e.g., shop owners, residents, passers-by) 'steps in' if no authority figures are present (in line with the assertions made by Sampson and Groves, 1989, and Shaw and McKay, 1942) or whether the broader environment will always add to the level of social control perceived by adolescents, regardless of whether authority figures are present. This would be an interesting issue for future research.

The role of the peers who are present in situations of unstructured socializing was explored in Chapter 7. The aim of this study was to determine whether unstructured socializing with some friends is more criminogenic than unstructured socializing with other friends. In total, four different friend characteristics were investigated: Friends' involvement in delinquency, friends' risk-seeking tendencies, friends' attitudes toward substance use, and age differences between the friend and the target adolescent. Findings suggested that it is particularly relevant whether friends are involved in delinquency: Unstructured socializing with substance using, stealing, vandalizing and violent friends enhanced adolescents' risk for engagement in similar behaviors. The risk was further enhanced if the friends were high frequent offenders (i.e., in the top ten percent of offending frequency). The other investigated friend characteristics (friends' risk-seeking tendencies, friends' attitudes toward substance use, and friends' age) were deemed to be of less importance. To isolate *situational effects* of spending time in unstructured socializing with delinquent friends from potential prior *socialization effects* of having delinquent friends, all models were controlled for the proportion of respondents' reciprocal friends that were delinquent. Additionally, analyses were replicated for subsamples: Adolescents who had both delinquent and non-delinquent friends. This offered a conservative control for potential selection effects that occur if past friendship selection is

predictive of present involvement in unstructured socializing. These analyses confirmed the initial findings.

The findings on friend characteristics provide indirect evidence that peers contribute to a deviance conducive environment. Delinquent friends may encourage an adolescent to deviance by 1) responding affirmatively to delinquent expressions (verbal or behavioral) and thereby provide positive reinforcement for delinquency (Dishion, Andrews, and Crosby, 1995; Dishion et al., 1996; Osgood et al., 1996); 2) instigating a deviant act (Warr, 1996); 3) provoking a (violent) response by threatening his or her status (Anderson, 1999; Short and Strodbeck, 1965); and 4) by merely being present and thereby contributing to a delinquency conducive situation because groups enhance risky decision making (Gardner and Steinberg, 2005; Warr, 2002). Future research should provide more insight into the situational processes through which adolescents influence each other because currently available data are insufficient to isolate them.

The findings on friend characteristics are also relevant to the debate in the literature about whether the association between unstructured socializing and delinquency exists independently from the effect of delinquent peers on delinquency (Haynie and Osgood, 2005). Some scholars, who found positive interactions between involvement in unstructured socializing and having delinquent peers, argued that the unstructured socializing-delinquency relationship was merely explained by association with delinquent peers and prior socialization by those peers (Bernburg and Thorlindsson, 2001; Svensson and Oberwittler, 2010; Thorlindsson and Bernburg, 2006). In the current study, an alternative situational explanation is proposed, relying on peers as motivators and facilitators of opportunities rather than viewing them as agents of socialization. It is argued that unstructured socializing is more strongly positively related to delinquency if delinquent friends are present because the presence of those friends shapes delinquent group processes. These processes have a direct effect on behavior and thus work situationally. This explanation is more in line with the original theory by Osgood et al. (1996).

In summary, the current study elaborated on, and thereby contributed to, the routine activity theory of general deviance (also referred to as the unstructured socializing perspective) of Osgood et al. (1996) by refining the conditions under which unstructured socializing is related to

adolescent delinquency. Findings of the study suggest that the relationship is stronger when unstructured socializing 1) takes place in public entertainment settings, on the streets and in open spaces; 2) takes place in areas with low collective efficacy; and 3) occurs in the presence of peers who are involved in vandalism, theft, violence, or substance use. The relationship is weaker or absent when unstructured socializing 1) takes place in private spaces (homes or friends' homes), public transportation, shopping centers, and other semi-public settings such as schools and sports clubs; 2) takes place in areas with high collective efficacy; and 3) occurs in the presence of non-delinquent peers.

Methodological implications

The concept of unstructured socializing is comprised of three conditions: The presence of peers, the absence of authority figures, and a lack of structure. As was illustrated in the introduction of this book, most of the previous studies into the unstructured socializing–delinquency relationship did not explicitly measure all three conditions. The current study improved upon these prior tests by applying time diary data to enable detailed and precise measurement of the unstructured socializing concept.

Time diary data allows for an operationalization that is closer in line with the original theoretical concept as proposed by Osgood et al. (1996). Evidently, one advantage was that it allowed for including all three conditions of the concept. However, the time diary approach had a second important advantage: It allowed for the inclusion of unstructured activities that would only be classified as unstructured socializing if peers were present and authority figures were absent. An example of such an activity is watching television. This activity qualifies as 'unstructured' according to the definition of Osgood et al. (1996: 640-641), who stated that unstructured activities leave time "available for deviance" and do not "place (...) individuals in roles that make them responsible for social control", which is applicable to watching television. However, Osgood et al. (1996: 643) do not include 'watching television' in their operationalization because this activity and three other activities "are more likely to occur in the home and are less likely to involve companionship." Most other studies similarly operationalized

unstructured socializing by only including unstructured activities that implied the presence of peers. This approach is understandable because their data did not allow for specification of whether peers and authority figures were present. Nevertheless, they were forced, in advance, to exclude activities that potentially comprised increased risks of delinquency. It is possible that watching violent YouTube clips together with a group of friends (without authority figures around) draws out crime favoring conversations that may result in rowdy behavior, especially when adolescents watch these clips on their smartphones while hanging out on the corner of a street. Time diary data allow for the distinction of who is present and participating in a given activity and thus enabled the inclusion of *only those situations* in which watching television occurred in the presence of peers and absence of authority figures. Therefore, the data enabled giving a more complete account of adolescents' involvement in unstructured socializing.

Generally, time use researchers have argued that time diaries are more suitable than stylized questionnaires (traditional questionnaire format) to measure daily activities. Most of all because individuals tend to underreport leisure activities if they are questioned about these activities over longer periods of time (Niemi, 1993; Robinson and Godbey, 1999), but also because stylized questionnaires are more prone to socially desirable answering and subjective interpretations of activities and locations. Furthermore, stylized questionnaires are unable to take into account potential secondary and tertiary activities and are more vulnerable to memory problems, such as overlooking brief activities and difficulties with estimating episode lengths (Robinson, 1999). The time diary method addresses these problems by questioning per time unit or activity episode and by letting respondents report their activities and whereabouts in their own words. These advantages of the space-time budget method for criminological research are discussed more elaborately in Chapter 3.

Using *space-time* budget data has another important advantage over the use of stylized questionnaire data because the information about the spatial locations of the activities can be combined with other information about that area. This enables a further specification of the context in which activities occur. Particularly, the study discussed in Chapter 6 applied data that was derived from community surveys, systematic social observations, and census data to scrutinize to what extent physical disorder and disorganization in the

surrounding area strengthened the unstructured socializing-delinquency relationship.

Constructing measures for this broader environment brings about its own set of methodological issues (Raudenbush and Sampson, 1999; Robinson, 1950). The current study made a modest contribution in addressing these issues with regard to the method of systematic social observation. In Chapter 4, an extension of the econometrics model of Raudenbush and Sampson (1999) was proposed by taking into account the allocation of observers (who conduct the systematic social observations) over different neighborhoods. Findings showed that the application of this new model, which corrected for observer bias, had implications for the relationship between the observed disorder in an area and police recorded crime rates. Although perhaps to a lesser extent, this reliability problem may also arise when applying other data collection methods. For example, when collecting data based on community surveys that are conducted in face-to-face interviews and key informants interviews, it is practical to assign interviewers to one area to save time and money on travel expenses. However, as the findings from Chapter 4 showed, this can cause reliability issues if one intends to aggregate the collected information to construct higher level measures, which is generally the case for ecological research.

Finally, in the last empirical chapter (Chapter 7), social network data were applied on the frequency respondents reported to hang out with their nominated friends. This application offered unique information for the investigation of characteristics of the friends with whom adolescents were *actually* engaged in unstructured socializing. Nevertheless, involvement in unstructured socializing was measured in a stylized questionnaire format, of which I have just extensively argued the disadvantages. For future studies on these and related topics, it is recommended to develop a research design that combines space-time budget information on 'whom are engaged in what activities' with social network information about the relationships between the target respondents and their nominated friends, and about the behaviors that those friends reported themselves.

In summary, the current study contributed to previous research methodologically by improving the operationalization for unstructured socializing, by applying space-time diary data, and by combining that data with information about the broader geographical area. Furthermore, the

study used social network data to examine characteristics of the friends with whom adolescents were engaged in unstructured socializing. Finally, the study advanced the ‘science of ecological assessment’ (Sampson and Raudenbush, 1999) by proposing a refined econometrics model that takes into account the allocation of (systematic social) observers over research areas.

Beyond unstructured socializing: Specifying criminogenic behavior settings

The current study elaborated on the relationship between unstructured socializing and delinquency by distinguishing short-term and long-term underlying processes and by refining conditions that strengthen and weaken the relationship. These insights can be combined by applying an alternative and broader theoretical framework. Unstructured socializing is then perceived as a defining element within the concept of criminogenic behavior settings. In the remainder of this section, I will explain what behavior settings are; I will argue that situations of unstructured socializing approach the concept of behavior settings; and I will show how the unstructured socializing perspective can offer a point of departure for further scrutinizing *criminogenic* behavior settings.

The term *behavior setting* was proposed by Roger Barker, an ecological psychologist who sought to explain behavior, relationships, and everyday life of children. Behavior settings are specific units of the environment that incorporate both physical and social elements and have important influence over human behavior. They are “extra-individual units with great coercive power over the behavior that occurs within them” (Barker, 1968: 17). Examples of behavior settings are a soccer game, high school prom, church worship service, or PhD defense.

In an extensive fieldwork study, Barker and his associates divided up a town in Kansas into slices of time and space that were distinguished based on ‘standing patterns of behavior’ (Barker and Wright, 1955; Barker, 1963). The scholars discovered that children’s behavior could not be fully explained by personality or external social influences (from parents or school). Rather, the behavior appeared to be place specific: When in the drug store, children “behaved drug store” (Scott, 2005, about her personal

communication with Barker's associate and spouse Louise Barker). The scholars concluded that behavior of the children could best be understood by studying the environments in which the children participated (Barker, 1963). In scrutinizing the newly discovered unit, they found that the same location could host different settings at different times: A classroom could serve as location for an English class from 1.00p.m. to 2.00p.m. and for a parent-teacher meeting from 7.30p.m. to 8.00p.m. They further noted that behavior patterns existed independently of the people in the setting: Individuals could leave the setting and others could join while the behavior pattern remained intact. For example, in a supermarket, customers may come and go, but the behavior patterns of collecting and paying for groceries remain the same. The latter is an important feature of the theory as it underlines that behavior patterns are not characteristics of individuals within the setting. Behavior patterns are *extra-individual*; individuals are only elements within the greater setting.

Barker (1968; 1987; Barker et al., 1978) defined key attributes and properties of behavior settings that together formed the basis of his behavior setting theory. The list of key attributes is extensive and the theory quite complex, but in a simplified summary, the following important attributes can be distinguished: Temporal and spatial boundaries, standing patterns of behavior, behavior objects, and behavior-environment synomorphy. Every setting is made up of *temporal and spatial boundaries*. For example, the setting 'basketball game' is bounded within the walls of the sports hall, and ceases to exist once the game is over. A *standing pattern of behavior* is an "extra-individual phenomenon" that has "unique and stable characteristics that persist even when current inhabitants of the setting are replaced with other" (Schoggen, 1989: 31). Standing behavior patterns are bounded in time and place to a particular setting, and a behavior setting consists of one or more standing patterns of behavior. For example, in class, behavior patterns are teaching (the teacher) and listening (the students). *Behavior objects* within the setting can be human or nonhuman (social and physical); they can be buildings, park benches, or friends. Behavior objects differ in their impact on behavior. Some behavior objects are passive, others intrusive (Barker, 1987). *Behavior-environment synomorphy*; the different elements of the setting are similar in form (synomorphic) and the physical elements facilitate the behavioral elements. For example, in a classroom, the chairs face the blackboard in order for the children to face the teacher during class.

More recently, Per-Olof Wikström argued that behavior settings are the appropriate ecological units to examine environmental influences on individual *delinquent* behavior (Wikström, 1998; Wikström et al., 2010; Wikström et al., 2012a; Wikström and Loeber, 2000; Wikström and Sampson, 2003). He argued that individuals are affected in their actions by that part of the environment they can “access through their senses” and not by broader environments, such as the neighborhood or census tract, on which much of the ecological criminological studies still rely (Oberwittler and Wikström, 2009: 57). Wikström proposed a further investigation of *criminogenic* behavior settings: Behavior settings that are conducive to crime. He argued that “it is plausible that some types of behavior settings are more likely than others to create situations in which individuals may act unlawfully” (Wikström and Sampson, 2003: 125), so indicated by the unequal distribution of crime over time, space, and legal activities (Cohen and Felson, 1979). Particularly, he pointed at the criminogeneity of unsupervised and unstructured peer-oriented leisure activities, city centers, public entertainment settings, and areas with poor collective efficacy (Wikström et al., 2010; Wikström et al., 2012a). In order to measure these criminogenic behavior settings, he adapted techniques from time use studies to develop the space-time budget method (Wikström, Treiber, and Hardie, 2012c, see also Chapter 3) and started gathering data with this method among adolescents in Peterborough, England (Wikström and Butterworth, 2006; Wikström et al., 2012b).

Despite the important groundwork of Barker and Wikström, it remains largely unclear what defines and operationalizes a ‘criminogenic’ behavior setting⁴¹. In this book, I integrated the unstructured socializing perspective (Osgood et al., 1996) with other criminological theories and, in fact, constructed a practical definition of criminogenic behavior settings. The concept of unstructured socializing in itself approaches the definition of a behavior setting. As argued in Chapter 2, adolescents conduct behavior in a setting of unstructured socializing that they would not conduct in another setting, such as during a family dinner. This implies that *standing patterns*

41 In the monograph *Breaking Rules*, Wikström et al. (2012a) make a terrific start in scrutinizing the different conditions of a criminogenic behavior setting, referred to as *criminogenic setting and moral context*. The current study contributes to their work by investigating a wider variety of situational conditions, holding stronger controls for potential selection effects (of individuals selecting themselves into certain settings), and offering a more elaborate theoretical framework for how the proposed conditions contribute to crime-conducive situations.

of behavior are present in situations of unstructured socializing. A setting of teenagers hanging out is also bound in time and space. Imagine, for example, a group of girls hanging out on a bench in the Princess Beatrix park in Meppel (the Netherlands) on a Friday afternoon⁴². They go the park around 3.00p.m., after their final class, and stay there until about 5.30p.m., as some of them are expected to be home for dinner. The *temporal boundaries* are thus 3.00p.m. and 5.30p.m.; the *spatial boundaries* are formed by the area in which they hang out within in the park. In this scenario, *behavior objects* are the girls, other people who are present but not necessary involved in the activity (e.g., passers-by), and elements of the physical environment where the activity occurs (e.g., the park bench, a trash bin, natural features of the park, such as grass and bushes). *Behavior-environment synomorphy* is illustrated by some of the girls sitting on the bench.

The specification of the unstructured socializing-delinquency relationship with functional location (Chapter 5), areal disorganization and disorder (Chapter 6), and characteristics of the present peers (Chapter 7) offers clues to what behavior objects in unstructured socializing settings are specifically criminogenic. First, *the peers who are present* have an important impact on adolescents' behavior and can provide immediate stimulation of delinquency (as audience, instigators, reinforcers, or provokers). They can also contribute to a deviance conducive setting by shaping standing behavior patterns in which deviant talk and deviant acts are tolerated or even encouraged. The present peers contribute to type-specific crime conducive settings: Unstructured socializing with vandalizing friends increases adolescents' risk for engaging in vandalism; unstructured socializing with friends who engage in theft increases adolescents' risk for theft, and so forth. Second, *the people who are present but not actively participating* in the activity are potential sources of social control and supervision. Their effect on adolescents' delinquency is illustrated by the findings on functional location and areal disadvantage: Unstructured socializing is more strongly related to delinquency if it occurs in locations where 'other' people generally do not feel responsible (Eck, 1994; Felson, 1995) and in neighborhoods where residents feel unable or unwilling to interfere when rules are broken (Sampson, Raudenbush, and Earls, 1997). People who are present but not actively participating in the

42 A hypothetical scenario, autobiographically inspired.

activity may also form targets or provokers of delinquency. One explanation for the finding that the unstructured socializing-delinquency relationship is amplified in public entertainment settings is that such locations are generally crowded with drunk, and therefore inconsiderate, people, which potentially evokes aggression. Third, *attributes in the physical environment* have been theorized to offer targets for delinquent behavior (such as 'hot products' in shopping centers, Clarke, 2002), to form cues that inappropriate behavior is tolerated (such as physical disorder; Keizer, Lindenberg, and Steg, 2008; Wilson and Kelling, 1982), or to facilitate delinquency through other ways (such as available alcoholic beverages in public entertainment settings that may evoke aggression and other inappropriate behaviors). Nevertheless, findings of the current study do not indicate that physical disorder in the area strengthens the unstructured socializing-delinquency relationship, nor do they indicate that unstructured socializing is particularly criminogenic in shopping centers. The criminogeneity of other physical attributes should be determined in future studies.

In summary, criminogenic behavior settings may be valuable units to examine environmental influences on individual delinquency. Nevertheless, much remains unclear about features that make behavior settings particularly criminogenic. The findings of this study can be used to specify criminogenic elements within unstructured socializing settings. I conclude that characteristics of the participating peers (whether they are delinquent), other people who are nearby (whether they feel responsible, willing and able to exert social control), and standing patterns of behavior (of poor collective efficacy or tolerance toward delinquency), contribute to the criminogenic nature of unstructured socializing. Further research is necessary to determine the criminogeneity of particular physical attributes in the setting, for example the physical attributes of criminogenic *functional* locations.

Broader theoretical implications for criminology

Criminology has thus far predominantly focused on *either* the patterning of criminal events in time and space *or* on background factors and life patterns that explained individual involvement in delinquency (Eck and Weisburd, 1995; Farrington, Sampson, and Wikström, 1993). As Wikström

(2006; Wikström and Sampson, 2003) suggested, the focus on a small unit that represents the micro environments in which individuals operate (incorporating both physical and social elements of those environments) has the potential to unite these lines of research. *Criminogenic behavior settings* potentially provide a key unit to understand 1) spatial crime patterning, 2) variation in criminal involvement across social strata, and 3) individuals' criminal involvement over the life course.

Pertaining to the first line of research, *spatial concentrations of crime* exist because a) something about the environment facilitates or stimulates crime or b) something about the environment attracts individuals (as visitors or residents) with certain backgrounds and intentions (Brantingham and Brantingham, 1995). Regarding the *facilitating crime* explanation, following the behavior setting approach, we would expect that social elements and physical elements (e.g., facilities, the location of trees or walls that prevent or stimulate supervision, signs that indicate standing patterns of behavior) at places deter, prevent, facilitate, or stimulate delinquent behavior. Understanding which physical and social elements of contexts are facilitative or stimulative of delinquency (i.e., what makes a behavior setting criminogenic) may help in understanding this spatial crime patterning: Places rich in criminogenic physical and social elements are more likely to produce delinquent behavior among their residents and visitors. Therefore, based on findings of the current study, as well as on findings of earlier studies (Wikström et al., 2010; Wikström et al., 2012a), we would expect that areas with concentrations of public entertainment settings and areas with poor collective efficacy have higher crime rates because they are characterized by standing behavior patterns of substance use and low supervision (e.g., Sampson, Raudenbush, and Earls, 1997; Shaw and McKay, 1942). Regarding the *attracting offenders* explanation, to understand spatial crime patterning from this perspective, we need to know why potential offenders are attracted to certain features of places, and where places with those features can be found. Thus, we do not only need to know what kind of activities or social environments adolescents⁴³ are attracted to (e.g., unstructured socializing), but also in what types of locations they prefer to engage in those activities.

43 According to Osgood et al. (1996), all adolescents are potential motivated offenders, as motivation resides in the situation.

The Brantinghams refer to crime attractors as locations that attract individuals with criminal intentions. In the case of adolescents' hanging out, I do not think the adolescents are necessarily looking for trouble, but may nevertheless still be attracted to locations where supervision is low or with other benefits, such as the presence of recreational facilities. Adolescents select their hangouts not only based on social elements but also based on physical elements. The study of Bichler, Malm, and Enriquez (2014) showed, for example, that delinquent youth were drawn to shopping malls and large movie theaters to spend their leisure hours. Additionally, findings from Chapter 6, as well as from Wikström et al. (2012a), suggest that adolescents may be drawn to disadvantaged neighborhoods when engaging in unstructured socializing. Therefore, and based on persistent findings that crime concentrates in particular facilities (e.g., Eck, Clarke, and Guerette, 2007; Felson, 1987), we would expect that particular facilities, areas with concentrations of public entertainment settings, and areas with poor collective efficacy have higher crime rates because they are characterized by certain physical and social elements that attract adolescents seeking a place to hang out. As a final remark within this topic, I would like to point out that behavior settings theory is also applicable in explaining temporal variation in spatial crime patterns. To give an example, areas that facilitate both entertainment facilities and shops will attract a different public at different hours, depending on the opening hours of those facilities. These areas will thus form different contexts for (delinquent) behavior over the course of the day and week; one area can contain different behavior settings at different times, which might explain the dynamic nature of spatial patterns in crime. In conclusion, I propose that a better understanding of which behavior settings *attract* potential offenders, which behavior settings *facilitate* crime, and *where and when* those behavior settings can be found will enable a better understanding of static and dynamic spatial patterns in crime.

Second, *individual characteristics* that have consistently been related to increased risks of delinquency are gender, age, and socioeconomic status; males are more often involved in delinquency than females, adolescents are more often involved in delinquency than children and adults, and individuals from disadvantaged backgrounds (e.g., neighborhoods, families, lower educational levels) are more likely to engage in delinquency than individuals from higher socioeconomic status. However, as Wikström (2014: 74) pointed

out: “Being male, teenager or belonging to an ethnic minority does not move anyone, for example, to steal a CD from a shop, break into a car, burn down a school building or blow up an aircraft. *Attributes cannot be causes.*” In line with this, the link between individual attributes and their involvement in delinquency may partly be found in their exposure to criminogenic behavior settings. From previous studies we know, for example, that males are more often involved in unstructured socializing than females (Osgood et al., 1996; Vazsonyi et al., 2002) and that individuals from disadvantaged neighborhoods are more likely to spend their time in equally disadvantaged areas (Krivo et al., 2013; Wikström et al., 2012a). It is, therefore, a plausible assumption that social variation in delinquency, with respect to these key demographics, is explained at least partly by differential exposure to criminogenic behavior settings. As Osgood et al. (1996: 652) said: It is likely that “routine activities are a key intersection between the macro level of social structure and the micro level of individual lives.” A better understanding and definition of criminogenic behavior settings therefore allows for a better understanding of why some groups of individuals are more likely to engage in delinquency than other groups of individuals.

Third, *life course crime patterns* are potentially also explained with exposure to criminogenic behavior settings. A routine activity perspective on the age-crime peak explains that adolescents have, compared to children and adults, considerable free time (they do not have major work or family responsibilities). Much of that free time is spent without parental supervision, more so than children, because adolescents gain autonomy from their parents as they grow older. Also, much of that free time is spent with peers and in unstructured ways, more so than in adulthood (Agnew, 2003). Indeed, several studies among adolescents show that involvement in unstructured socializing displays a similar age pattern as involvement in delinquency (Higgins and Jennings, 2010; Osgood et al., 1996; Stoolmiller, 1994), which are theorized to go hand in hand with more freedom and autonomy in leisure allocation (Felson and Gottfredson, 1984; Osgood, Anderson, and Shaffer, 2005). Thus, assuming that individuals’ delinquent dispositions remain the same across the life course, individuals are most likely to engage in delinquency in the life phases that offer the most opportunities. Their involvement in criminogenic behavior settings determines their exposure to opportunities for delinquency.

In summary, an understanding of criminogenic behavior settings and how they are distributed across space, individuals, and life courses may contribute to a further integration of three research lines in criminology: Ecological research, research on individual demographic and background factors, and life course research. An understanding of criminogenic behavior settings will thereby potentially expand our understanding of the variability in crime (Farrington, Sampson, and Wikström, 1993). The current study contributes to the literature by building on previous efforts in defining and operationalizing these intriguing and promising units. In doing so, I have argued that the concept of unstructured socializing of Osgood et al. (1996) approaches the concept of behavior settings (Barker, 1968) and that it may offer a great point of departure for further scrutinizing *criminogenic* behavior settings (Wikström, 1998; Wikström et al., 2012a).

Limitations and future research

Generalizability

Data for the current study were derived from approximately 600 adolescents (aged 11 to 20 years) from a large city in the Netherlands (Chapters 2, 5, and 6) and from approximately 10,000 adolescents (aged 10 to 17 years) from rural areas in the United States (Chapter 7). These samples did not only differ in urban background but also in other aspects. To mention one, the Dutch group was highly ethnically diverse, whereas the American teenagers were predominantly Caucasian. Thus, the results from Chapter 7 may not be applicable to the Dutch adolescents, and the results from Chapters 2, 5, and 6 may not be generalizable to the American sample. Furthermore, both samples overrepresented adolescents with a low socioeconomic status: the Dutch sample incorporated a relatively large number of adolescents enrolled in lower forms of secondary education; the American sample incorporated a relatively large number of adolescents who were eligible for free or reduced cost school lunches.

However, the aim was not to describe (inter)national spatial activity patterns of adolescents or to claim that the presented descriptive statistics about adolescents' involvement in unstructured socializing at certain

locations (Chapters 5 and 6) or with certain peers (Chapter 7) were generalizable beyond the applied samples. Rather, the study was concerned with explaining and specifying the relationship between involvement in unstructured socializing and adolescent delinquency; a relationship that has proven to be rather robust across nations (Steketee, 2012; Vazsonyi et al., 2002) and demographic characteristics (see the literature review in Chapter 1). Of course, further research is necessary to replicate these studies, to test the proposed hypotheses in non-western countries, and to explore their value across groups of individuals with different delinquent dispositions.

Limitations of the space-time budget method

Even though the space-time budget method has important advantages over other methods in measuring respondents' exposure to unstructured socializing, the method has its limitations as well. The most basic limitation is that, because the method is incredibly detailed and thus time consuming, the method can only be applied to a few days. This leaves room for measurement error because 1) it is unclear whether those days give a representative account of the respondents' general activities and whereabouts and 2) rare activities are unlikely to be captured. The decision to use time units of one hour and predefined spatial units introduce other limitations as well, such as the possibility of deciding on a spatial unit that does not fit the research topic (Openshaw, 1984), underreporting secondary activities, inability to establish the duration of brief activities, and the inability to apply the method to research areas larger than a city (these problems are discussed more thoroughly in Chapter 3). The two issues mentioned before, however, are considered to be the most important limitations.

With regard to the first topic, seasonal influences and the exclusion of holidays and Sundays may affect the extent to which the space-time budget information is representative for the respondents' general activities. It is likely that adolescents' activities vary with the weather, especially the activities that occur outside, such as unstructured socializing on the street.

With regard to the second topic, the method will only capture 'rare' activities, such as delinquency, for individuals who engage in those behaviors frequently (Gershuny, 2012; Van Halem et al., 2015). Although I have taken this into account by mainly focusing on the delinquency that was reported

in the stylized questionnaires, involvement in unstructured socializing can also be perceived as rare activity, especially when specified for particular circumstances. For example, relatively few hours were spent in unstructured socializing in public entertainment settings or shopping centers.

This is a potentially important limitation of the method if one is interested in individuals' exposure to very specific criminogenic behavior settings. The more conditions are added to the definition of a criminogenic behavior setting, the more rare exposure to that setting becomes, and the less likely that it will be captured by the space-time budget method. Luckily, a solution for this problem is currently under development. An increasing number of projects apply smartphone technology to collect (space-)time use information (e.g., Browning et al., 2014; Sonck and Fernee, 2013). As this method is less burdensome on the respondents, it allows for the collection of information over longer periods of time (e.g., a month instead of four days).

Individual characteristics

Evidently, an act of crime is better understood when taking into account both the type of environment and the kind of individual in that environment (Wikström, 2004; 2005; 2014). In the current study, I decided to focus on defining criminogeneity of the environment and thereby ignoring the individual risk factors. This was a well-considered decision that enabled me to have a detailed examination of 'risky environments'. Nevertheless, it seems appropriate to elaborate a little on individual characteristics and their interaction with individuals' surroundings.

There has been quite some (theoretical) interest in the investigation of interaction effects between criminogenic behavior settings, on the one hand, and individual dispositions that are believed to stimulate risk of delinquency, on the other hand (Wikström and Butterworth, 2006; Wikström et al., 2012a). In particular, interactions have been proposed and investigated between criminogenic behavior settings and self-control, attitudes favoring rule breaking, and risk taking. The theoretical relevance of this interaction is straightforward: The combination of crime prone individuals in crime conducive environments is believed to amplify risks of delinquency. The empirical evidence for this interaction, however, is not so convincing. As discussed in Chapter 1, most of the studies did not find an interaction of self-

control or impulsivity with unstructured socializing in predicting delinquency (e.g., Maimon and Browning, 2010; Thomas and McGloin, 2013), although a few studies offered partial support for such interaction (e.g., Hay and Forrest, 2008; LaGrange and Silverman, 1999). On the other hand, there is some evidence that the unstructured socializing-delinquency relationship is moderated by individuals' risk-seeking tendencies (LaGrange and Silverman, 1999) and attitudes toward delinquency (Bernburg and Thorlindsson, 2001). Nevertheless, based on these findings, there is no consistent evidence that some individuals are, to an extent, 'immune' to temptations of delinquency, whereas others are more susceptible to external influences. This speaks to the idea, advocated by Osgood et al. (1996), that most individuals have the potential for acting upon opportunities for deviance.

A theory in criminology particularly concerned with the interaction between individuals and the (micro) environments they are exposed to is Situational Action Theory (Wikström, 2004; 2005; 2014). The theory proposes that a criminal event is the outcome of a perception-choice process that occurs when individuals are exposed to temptations and provocations provided by their environment. The theory is aimed at explaining crime through the investigation of individual characteristics (specifically their crime propensity, a composite of self-control and morality), as well as the characteristics of the environments in which the individuals take part. The current study provided a more elaborate theoretical rationale for why some behavior settings are more criminogenic than others, and thereby theoretically extended one of the elements of the Situational Action Theory. These theoretical additions will hopefully be used to further develop and test the most important principle of Situational Action Theory: That delinquent acts are the outcome of the interaction between individual and environment.

Choices and constraints

The focus of this study was on the relationship between involvement in unstructured socializing and adolescent delinquency. Elaborate statistical techniques were applied to control for individual differences in background factors and thereby for potential selection effects that are pertinent if, for example, crime prone individuals prefer unstructured leisure settings over

other settings. Nevertheless, even though these potential selection effects were taken into account, the study did not discuss in depth the debate about choices versus constraints. It is possible that individuals 'select' the contexts to which they are exposed. Individuals allocate time to activities based on their preferences, their traits, their perception of the accessibility of facilities, and the constraints they experience that limit their alternatives (Chapin, 1974; Dangschat et al., 1982; Hägerstrand, 1970). We can distinguish self selection and social selection (Thoits, 2006); the former refers to selection through individuals' preferences (e.g., risk-seeking individuals will prefer dangerous or edgy leisure activities over others), the latter to selection through (social) constraints on the available opportunities (e.g., adolescents cannot join a soccer club if their parents are unable to afford membership).

There is modest support for self selection effects. On the one hand, studies have shown that delinquent behavior is predictive of later involvement in unstructured socializing (Fleming et al., 2008; McHale, Crouter, and Tucker, 2001; Posner and Vandell, 1999; Vásquez and Zimmerman, 2014). On the other hand, despite the assertion of Gottfredson and Hirschi (1990: 157) that "People who lack self-control tend to dislike settings that require discipline, supervision, or other constraints on their behavior; (...). These people therefore tend to gravitate to 'the street'", evidence that individual propensities (such as self-control or moral values) predicted later involvement in unstructured socializing is inconsistent. Some studies found that low self-control was indeed predictive of later unstructured socializing (Maimon, 2009; McGloin and Shermer, 2009), but others found that the effect disappeared after controlling for other characteristics (Maimon and Browning, 2010; Müller, Eisner, and Ribeaud, 2013).

Social selection appears to be more relevant. Findings of existing studies imply that adolescents are indeed constrained in their choice to engage in unstructured socializing. For example, studies have shown that disadvantage in the residential neighborhood is predictive of disadvantage in the areas where people spend their time (Krivo et al., 2013; Wikström et al., 2012a). In line with these findings, findings of the current study (Chapter 6) indicated that ethnic heterogeneity in the residential neighborhood affected the extent to which adolescents were involved in unstructured socializing, as well as the extent to which they were involved in unstructured socializing in low collective efficacy neighborhoods. Constraints raised by parents are also

relevant in predicting adolescents' involvement in unstructured socializing. Adolescents from single parent families (Bernburg and Thorlindsson, 2007; Osgood and Anderson, 2005), adolescents whose parents are not married (Maimon, 2009), adolescents whose parents provide insufficient response to rule breaking (Janssen, Deković, and Bruinsma, 2014), and adolescents who have much autonomy in choosing whether to stay out late at night (Goldstein, Eccles, and Davis-Kean, 2005) are more likely to engage in unstructured socializing. Also relevant in this regard is whether adolescents' have other reasons to leave the house, such as structured hobbies or jobs, which increase their opportunities to engage in unstructured socializing afterwards. Particularly, Gardner, Roth, and Brooks-Gunn (2009) found that sports participation increased adolescent boys' involvement in unstructured socializing, which increased their involvement in delinquency. Similarly, Staff et al. (2010) found, in a study among in-school youth, that having a job was predictive of involvement in unstructured socializing and, indirectly, of delinquency. They argued that employment provides adolescents with financial resources, which allows for more autonomy and opportunities to engage in more unstructured socializing. Osgood (1999) proposed that adolescents hang out with their colleagues after work, thereby increasing their involvement in unstructured socializing. Such arguments apply also to sports: Adolescents may have a drink and hang out after practice or a game. Another source of constraints is socioeconomic status. We would expect that adolescents from disadvantaged backgrounds are more often engaged in unstructured socializing because of a lack of alternative leisure opportunities. However, studies indicate an opposite effect: Adolescents from higher income families or whose parents received higher levels of education spent more time in unstructured socializing (Goldstein, Eccles, and Davis-Kean, 2005; Maimon, 2009; Osgood et al., 1996). Osgood et al. (1996) explained this by arguing that higher social class offers youth greater freedom of movement, which is consistent with the conclusions of Staff et al. (2010) regarding adolescents' own employment. Immigrant generational status was not predictive of involvement in unstructured socializing (DiPietro and McGloin, 2012).

In summary, it seems that existing studies provide evidence for social selection effects, and modest support for self selection regarding involvement in unstructured socializing. Further investigation of adolescents' involvement

in unstructured socializing, or their exposure to criminogenic behavior settings, warrants further investigation into such selection effects. Particularly, the interrelations between delinquency, delinquent peer associations, and involvement in unstructured socializing are in need of unraveling. The current study was undertaken from the assumption that involvement in unstructured socializing predicted association with delinquent peers (Chapter 2) and involvement in delinquency (entire book). However, as discussed previously, delinquent behavior may also predict involvement in unstructured socializing (Fleming et al., 2008; McHale, Crouter, and Tucker, 2001; Posner and Vandell, 1999; Vásquez and Zimmerman, 2014), and delinquent peers may motivate adolescents to engage in future unstructured socializing (Maimon, 2009). The association between delinquent peers and delinquent behavior has also been shown to be reciprocal (e.g., Matsueda and Anderson, 1998) and research suggests that the three aspects (delinquency, unstructured socializing, and delinquent associations) change together over time from childhood to early adolescence (Stoolmiller, 1994).

Other elements that make situations criminogenic

Another area of interest for future research relates to additional criminogenic elements inherent in situations of unstructured socializing. I did not provide an exhaustive list of criminogenic conditions nor found the ultimate definition of a criminogenic behavior setting. Therefore, I hope to inspire other scholars to explore additional conditions. In particular, the following aspects are recommended for further investigation: Individuals' perceptions of the situation, group composition, and group processes.

How an individual will act in a certain setting, depends on how he or she *perceives* the situation. Although individuals' responses to the environment are, to some extent, inherent to their personalities (Wikström, 2006; 2014), the fact that the same individuals sometimes respond differently in seemingly similar situations suggests that they those situations are perceived differently (Birkbeck and LaFree, 1993). Research about affective states, for example, indicates that individuals are less likely to become involved in drunk driving or other risky behavior if they are in a positive mood (Kamerdzde et al., 2014). To better understand criminogenic situations, the current study into the *objective* elements of behavior settings can be extended with an examination

of the *subjective* elements, which are at least as important in explaining the behavioral outcome.

The structure, or composition, of the group of peers with whom adolescents are involved in unstructured socializing may be relevant to their risk of involvement in delinquency. *Group* refers here to a small group of about three to ten individuals who are participating in the activity and who are in direct interaction with each other. It would be interesting to investigate whether varying group sizes affect the criminogeneity of the activity. It would also be interesting to investigate the composition of the group with regard to 1) the nature of the friendships, whether it is a tight-knit group or assembly of distant acquaintances (Siennick and Osgood, 2012); 2) age differences in the group (Warr, 1996); 3) gender composition, whether it is a same-sex, opposite-sex, or mixed-sex group (Lam, McHale, and Crouter, 2014; Peterson, Miller, and Esbensen, 2001); and 4) variation in delinquent experience (Warr, 1996).

To determine the group processes through which peers influence each other's behavior, it is necessary to look in detail at the social interactions that take place. Observational studies have suggested that provocation and 'signifying' are important processes at play (Anderson, 1999; Short and Strodtbeck, 1965), quantitative studies pointed at instigation (Warr, 1996; McGloin and Nguyen, 2012), and prior experimental research established the presence of positive reinforcement (Dishion, Andrews, and Crosby, 1995; Dishion et al., 1996) and imitation (Bot et al., 2007; Larsen et al., 2010). Future research needs to further scrutinize these, and perhaps other, group processes and disentangle their coherence with friendship characteristics and characteristics of the individual group members.

Policy implications

The research presented in this book was primarily concerned with furthering our understanding of the association between unstructured socializing and adolescent delinquency. As such, it was not undertaken to provide tools for practitioners to handle nuisances caused by unsupervised youth groups, to develop ways to discipline young offenders, or to prevent first offenders from furthering their criminal careers. Nevertheless, the study provides

information that is potentially useful for practice.

Parental supervision: Even though it seems obvious, it is important to emphasize the major role that parents still have when their kids reach adolescence. Parents have the authority and ability to restrict their kids' involvement in unstructured socializing (Janssen, Deković, and Bruinsma, 2014; Osgood and Anderson, 2004; Osgood, Anderson, and Shaffer, 2005), and may thereby affect their kids' involvement in delinquency (Goldstein, Eccles, and Davis-Kean, 2005; Janssen et al., 2015). Research on after school care showed that less supervision in the after school hours was associated with increased risks of externalizing problems (Galambos and Maggs, 1991; Pettit et al., 1999), increased association with delinquent peers, less impulse control (Galambos and Maggs, 1991), and higher susceptibility to peer pressure to engage in antisocial activity (Steinberg, 1986). Monitoring and supervision can also take on an indirect role: Bernburg and Thorlindsson (2007) found that adolescents were less often involved in unstructured socializing if their parents' knew their friends and the parents of their friends.

Hangout locations: Findings of the current study indicated that the perceived social control (in the form of the public nature of the location and collective efficacy in the area) at locations where adolescents spend time in unstructured socializing affected the relationship between unstructured socializing and adolescent delinquency. A policy implication would be to improve indirect supervision at such 'hanging' locations, in order to reduce delinquent acts of the adolescents who are engaged in unstructured socializing at those locations. One practical way to do this is to facilitate hangouts in sight of nearby residential buildings or shopping areas⁴⁴. However, there are complicating practical issues associated with the facilitation of hangout locations by the local government. First, adolescents are not always willing to hang out at locations organized by the municipality, especially if they were uninvolved in the decision making process. Increasing supervision at hangout locations may drive teenagers away in any case, regardless of their involvement. Second, facilitating hangout locations in sight of residents or shops may be beneficial for adolescents' delinquency risks, but is also likely to increase nuisances for those residents or shop owners. Third, it

44 This implication was proposed and discussed at a meeting for practitioners on February 5th 2015, organized as part of the research project (Hoeben and Feitsma, 2015).

sometimes occurs that one group takes possession of a hangout location and blocks other groups, who are then forced to hang out at other, less suitable, locations. Fourth, adolescents generally choose their hangout location based on practical considerations, such as whether free wireless internet is available, whether they can shelter from the rain, and whether toilets are nearby. Local governments have to account for these considerations when organizing hangout locations⁴⁵.

Structuring leisure activities: To reduce nuisances caused by groups of teenagers hanging around a particular location, policy makers or municipalities could structure this ‘unstructured’ socializing. This structuring could be pursued by facilitating, for example, a basketball court or half pipe, or, in a more active approach, organizing activities in the after-school hours (Centrum voor Criminaliteitspreventie en Veiligheid, 2008). After school programs have been organized in the United States on a large scale (Gottfredson, Cross, and Soulé, 2007; James-Burdumy et al., 2005). Also, parents who are concerned about their teens’ leisure fulfillment could let their teenagers join a sports club, pay for lessons for musical instruments, or otherwise organize more structured agendas. Such activities would not only provide adolescents with structure in their day and week, but they would also increase adult supervision in the after school hours, as they generally involve a coach, trainer, teacher, or other authority figure.

Do we need to force adolescents into structured leisure activities?

Having discussed these policy implications, the question arises whether it is actually necessary, or even desirable, to structure adolescents’ leisure activities. Do we need to force adolescents into structured leisure activities? My view is that we should not. On the one hand, there is indeed quite some evidence for the positive developmental outcomes of involvement in structured leisure activities. Studies have shown that structured activities are related to future educational achievement, identity formation, skill building, emotional well-being, and several other positive developmental outcomes (Bartko and Eccles, 2003; Eccles et al., 2003; Larson, Hansen, and Moneta,

⁴⁵ See also Dutch reports from Centrum voor Criminaliteitspreventie en Veiligheid (2008), and Noorda and Veenbaas (2006), on youth groups and practical matters regarding the organization of hangout locations for youth.

2006). Further, the current study adds to the body of research that found clear relationships between unstructured activities—specifically unstructured socializing—and adolescent delinquency. However, on the other hand, there is not much empirical evidence indicating that *structuring* adolescents' leisure would lead to *less* delinquency (Gottfredson, Cross, and Soulé, 2007). We have known this for decades: “Research designed to evaluate the thesis that ‘idle hands are the devil’s workshop,’ that the fundamental approach to curing delinquency involves ‘getting kids off the streets’ has rarely produced evidence for the effectiveness of such programs” (Hirschi, 1969: 187). Rather, some studies have shown opposite effects, where the intervention group increased in delinquent behavior (James-Burdumy et al., 2005; Mahoney, Stattin, and Magnusson, 2001). Such undesirable effects are possibly explained by peer dynamics and the aggregation of low risk and high risk youth brought about by these programs (Dishion, McCord, and Poulin, 1999).

Although these issues have not been addressed in the current study, other studies suggest that the answer may be to *not* focus on structuring leisure activities, but on reducing adolescents' boredom, conflict, and other negative experiences. In situations of unstructured socializing, adolescents perceive more pressure from peers to engage in unwanted activities and more negative peer dynamics (e.g., inappropriate comments, jokes, or gestures) compared to in structured leisure activities (Larson, Hansen, and Moneta, 2006). These and other negative experiences may contribute to adolescents' delinquency, substance use, or other risky behavior (Caldwell and Smith, 2006; Wegner, 2011). Whether or not particular activities evoke negative experiences will differ per individual. For some adolescents, involvement in unstructured socializing or otherwise spending time with peers can lead to positive outcomes, such as emotional development, identity development, and positive social experiences (Allen and Antonishak, 2008; Larson, Hansen, and Moneta, 2006). For others, however, involvement in unstructured socializing is a way to ‘kill the time’ because they do not know what else to do. Unstructured socializing is then associated with boredom, and deviance a way to “add excitement to an otherwise uneventful situation” (Hawdon, 1996: 169). For those adolescents, intervention programs directed at leisure education may be relevant to improve well-being (Hansen and Larson, 2007) and reduce involvement in risky behaviors. Such programs increase adolescents' awareness of leisure time use, stimulate them to think about

their motivations to engage in activities (whether intrinsically motivated or because parents, peers, or teachers want them to), and teach them to develop a time allocation that appeals to their personal interests. At least one such intervention program has showed promising effects on reducing substance use among adolescents in Pennsylvania USA (Caldwell, 2005; Caldwell et al., 2004; Caldwell and Smith, 2006) and South Africa (Smith et al., 2008; Weybright et al., 2014). To that end, municipal policies, such as facilitating half pipes and basketball courts, indeed seem to be relevant: They provide adolescents with the opportunity to participate in structured activities, even if their parents cannot afford it. Further study into the associations between unstructured socializing, boredom, leisure motivation, and delinquency is warranted.

Concluding remarks

*Often it is not so much the kind of person a man is
as the kind of situation in which he finds himself that determines
how he will act – Stanley Milgram*

Behavior occurs in context. Especially during adolescence, individuals are exposed to a variety of external stimulants that attempt to dictate their behavior: Parents, school, but mostly their peers. Adolescents are extremely susceptible to influence from their peers (Berndt, 1979; Blakemore and Mills, 2014) and spend much of their time with them in unsupervised settings (Larson and Verma, 1999; Warr, 1993). Not surprisingly, it has been found that most delinquent acts committed by adolescents occur in the presence of one or two peers (Erickson and Jensen, 1977; Sarnecki, 2001; Warr, 1996).

Therefore, to understand adolescents' delinquency, it seems appropriate to have a thorough look at the settings in which adolescents encounter each other. The current study showed that some of those settings are more crime conducive than others. Settings of adolescents 'hanging out'—also referred to as unstructured socializing—were indeed related to increased involvement in delinquency (Osgood et al., 1996). Unstructured socializing exposes adolescents to delinquent peers, to perceived peer pressure to engage in delinquency, and to temptations to engage in delinquency, and it

makes adolescents increasingly tolerant toward delinquency. Unstructured socializing is particularly strongly related to adolescent delinquency if it occurs in certain locations (on the street, in open spaces, and in public entertainment settings), if it occurs in neighborhoods characterized by high levels of disorganization, and if it occurs in the presence of delinquent friends. In disentangling the underlying processes and scrutinizing the conditions that amplify the unstructured socializing-delinquency relationship, the current study enhanced our knowledge about *why* and under *what conditions* 'hanging out' is related to delinquency. Thereby, the current study made an important contribution in advancing our understanding of what is actually so bad about adolescents *hanging out and messing about*.



Summary



Summary

The phenomenon of groups of adolescents hanging out, not doing anything in particular, is a familiar occurrence across all times and all cultures. This behavior is also referred to as *unstructured socializing*. The concept of unstructured socializing, as formulated by Osgood et al. (1996), represents an activity without any structure, undertaken with peers in the absence of authority figures. Scholars have argued that adolescents' desire to meet friends away from parental supervision is part of a developmental process toward adulthood, whereby they distance themselves from their parents, discover their own identities, and develop social skills (Allen and Antonishak, 2008; Giordano, 2003; Vitaro, Boivin, and Bukowski, 2009). Nevertheless, despite these developmental advantages, involvement in unstructured socializing also makes it easier for adolescents to engage in less desirable activities, such as vandalism, shoplifting, and other forms of delinquency.

This book addresses the relationship between adolescents' involvement in unstructured socializing ('hanging out') and their involvement in delinquency. The study builds on the theory and empirical work of Osgood et al. (1996) and the stock of literature that has been published since on the relationship between unstructured socializing and delinquency. The aim of the book is to elaborate on the relationship between unstructured socializing and delinquency; theoretically, methodologically, and empirically. In order to achieve this, I examine underlying processes that *explain* the relationship, apply an innovative data collection method to better empirically *investigate* the relationship, and study situational conditions that *specify* the relationship.

Data on the time use and deviant behaviors of over 800 Dutch adolescents (aged 11 to 20, derived from the SPAN project) and over 16,000 American adolescents (aged 10 to 17, derived from the PROSPER Peers project) were used. These adolescents were recruited in their secondary schools. Two innovative data collection methods—the space-time budget method (a sort of time diary) and systematic social observation—were applied, in combination with more traditional methods, to improve the

operationalization of unstructured socializing, and to investigate situational conditions that potentially affect the unstructured socializing-delinquency relationship.

Unstructured socializing and adolescent delinquency

Since the publication of Osgood et al. in 1996, the concept of unstructured socializing has received increasing attention in sociological and criminological literature. Chapter 1 provides a theoretical and empirical overview of this literature, based on a systematic literature review. Almost all of the 74 studies that are included in this review found a positive relationship between unstructured socializing and delinquency. This speaks to the robustness of the relationship across research designs, measurement strategies, stages of adolescence, types of delinquency, and across countries. The relationship is again confirmed in the studies described in this book. Nevertheless, the review also shows a need of further investigation on at least three matters. First, little is known about factors that explain the relationship. Second, there is room for improvement in the operationalization of unstructured socializing. Third, we know little about situational factors that specify the relationship.

Why is unstructured socializing related to adolescent delinquency?

To start with the first gap in the literature: Why is unstructured socializing related to increased risks for delinquency? In Chapter 2, four potential explanations are formulated and empirically investigated. To formulate these potential explanations, the unstructured socializing perspective (Osgood et al., 1996) is theoretically integrated with several other theories and perspectives. First, based on routine activity theory (Cohen and Felson, 1979), it is theorized that unstructured socializing exposes adolescents to opportunities for delinquency, because of the lack of structure and absence of authority figures. Next, based on social learning theory (e.g., Akers, 1998; Burgess and Akers, 1966) and situational peer influence approaches (e.g.,

Dishion et al., 1996; Warr, 2002), it is theorized that unstructured socializing exposes adolescents to group processes that motivate delinquency, and make them increasingly tolerant toward delinquency. Finally, based on ideas about offender convergence settings (Felson, 2003) and association with conventional youth in structured activities (Eccles et al., 2003), it is theorized that involvement in unstructured socializing exposes adolescents to delinquent peers, which in turn affects their own delinquent behavior. Findings suggest that all of the proposed processes, directly or indirectly, explain the relationship. Involvement in unstructured socializing 1) exposes adolescents to temptations, i.e. perceived opportunities, to engage in delinquency; 2) exposes adolescents to delinquent peers, which subsequently; 3) increases their exposure to delinquent group processes; and 4) increases their tolerance toward delinquency. These processes together explain, for a large part, the differences and changes in delinquency among the adolescents studied.

Measuring the setting of unstructured socializing

In Chapters 3 and 4, the strengths and weaknesses of two promising research methods for capturing the setting of unstructured socializing are investigated. The first, discussed in Chapter 3, is the space-time budget method (Wikström and Butterworth, 2006; Wikström et al., 2012). This method records, retrospectively, over four days, the hourly activities and whereabouts of respondents. Because the time diary format allows for scrutinizing activities, as well as the people present in the setting, this method is particularly useful for operationalizing unstructured socializing. Moreover, the method maps adolescents' whereabouts and thereby extends the traditional focus on residential neighborhoods as sources of environmental influence.

The second method, discussed in Chapter 4, is systematic social observation (Perkins, Meeks, and Taylor, 1992; Perkins and Taylor, 1996; Taylor, Gottfredson, and Brower, 1984). This method is applied to observe and investigate physical and social disorder within street segments, which are features of the physical environment that can be related to delinquency. The study presented in this chapter is particularly concerned with observer bias. Characteristics of observers, such as whether they grew up in an urban

or rural area, may affect their perception of disorder. If the allocation of observers over different neighborhoods is not taken into account, this may affect aggregated measures of disorder. The chapter presents a model that directly controls for observer bias in ecological, i.e. aggregated, constructs. The model is a refinement of Raudenbush and Sampson's ecometrics model (1999). Application of this model has implications for the relationship between disorder in an area and police recorded crime rates.

What conditions strengthen or weaken the relationship between unstructured socializing and adolescent delinquency?

To explore which conditions strengthen or weaken the relationship between unstructured socializing and delinquency, three situational conditions are investigated. Chapters 5, 6, and 7 address, respectively, the role of the functional location (e.g., in a shopping center, on the street, at a friends' home), the role of disadvantage in the neighborhoods where adolescents spend time unstructured socializing, and the characteristics of friends with whom adolescents are engaged in unstructured socializing.

Functional location

With regard to the functional location (Chapter 5), the expectation is that unstructured socializing is more strongly related to delinquency if it occurs at locations where social control is low. The extent to which social control is exerted at locations depends on the extent to which people feel responsible for those locations. People generally feel responsible for what happens in their homes (private space) but much less so for what happens on the street (public space). To hypothesize which locations are specifically crime conducive, we integrate Felson's classification (1995) on responsibilities of places with the unstructured socializing perspective (Osgood et al., 1996). In line with the hypotheses, findings indicate that unstructured socializing in private spaces is less strongly related to delinquency than unstructured socializing in semi-public and public spaces. In particular, unstructured socializing in public entertainment facilities, on the streets, and in open spaces is related

to increased adolescent delinquency, more so than unstructured socializing in shopping centers, public transportation, and other semi-public settings, such as schools and sports clubs. These findings are potentially explained by the supervision exerted by shop owners, employees at facilities for public transportation (e.g., a tram conductor), and employees at the other semi-public settings (e.g., concierge), who are assigned responsibility for a location as their primary job. Although this remains speculation, it is possible that such employees interfere when a nearby group of adolescents becomes too rowdy or noisy, or when they show signs of initiating delinquent behavior.

Disadvantage in the neighborhood

Is 'hanging out' in disadvantaged neighborhoods more strongly related to delinquency than hanging out elsewhere? To address this question, in Chapter 6, the unstructured socializing perspective is theoretically integrated with social disorganization theory (Sampson, Raudenbush, and Earls, 1997; Shaw and McKay, 1942) and broken windows theory (Wilson and Kelling, 1982). According to social disorganization theory, disorganization in a neighborhood reflects the inability or unwillingness of residents to establish social control in their neighborhoods. It follows then that, in neighborhoods with high levels of disorganization, residents are less likely to supervise groups of adolescents who are hanging out in that area. Adolescents may therefore feel less restricted in their behavior, which will possibly translate to participation in delinquency. Similarly, signs of disorder can be viewed as cues that inappropriate behavior is tolerated in that area, that 'nobody cares' (Wilson and Kelling, 1982). Signs of disorder thereby provide signals that deviant acts will likely go unpunished. In this study, seven indicators of social disorganization are investigated, socioeconomic status, ethnic heterogeneity, residential mobility, family disruption, population density, structural density, and collective efficacy, along with an indicator expressing the level of physical disorder. Of these indicators, collective efficacy, i.e. social trust and social control among neighborhood residents, appears to be the only one to affect the unstructured socializing-delinquency relationship: Unstructured socializing in neighborhoods with low levels of collective efficacy is more strongly related to delinquency than unstructured socializing in other neighborhoods. This implies that when adolescents hang out in

neighborhoods where residents are unable or unwilling to exert supervision, such activity is more strongly related to delinquency.

Delinquent peers

Does ‘hanging out with the wrong crowd’ indeed facilitate delinquency and substance use? The role of peers with whom adolescents engage in unstructured socializing (Chapter 7) is theorized based on situational peer influence approaches (Dishion et al., 1996; Warr, 2002), and the literature on co-offending (e.g., Warr, 1996). It is theorized that peers who are present in an unstructured socializing situation may encourage an adolescent to commit delinquent acts by 1) responding affirmatively to delinquent talk or behavior, and thereby providing positive reinforcement for delinquency; 2) by instigating a delinquent act; 3) by threatening his or her status and thereby provoking a (violent) response; or 4) by merely being present and thus providing a group setting that “deflects, dilutes or supplants moral responsibility” (Warr, 2002: 70). Furthermore, it is theorized that the peers who are more likely to reinforce, instigate, or provoke delinquent behavior, are those peers who are delinquent, risk seekers, tolerant toward rule breaking, or the peers who are older than the respondent. Findings suggest that it is particularly relevant whether peers are involved in delinquency: Unstructured socializing with substance using, stealing, vandalizing, and violent peers enhances adolescents’ risk for engagement in similar behaviors. The other peer characteristics investigated (risk seeking, attitudes, and age) are deemed to be of less importance.

Concluding

In disentangling the underlying processes and scrutinizing the conditions that strengthen the unstructured socializing-delinquency relationship, this book enhances our knowledge about *why* and under *what conditions* ‘hanging out’ is related to delinquency. Thereby, this book makes an important contribution to advancing our understanding of why we should be concerned about adolescents *hanging out and messing about*.



Samenvatting



Samenvatting

“hoe vele Jongelingen loopen der rinckelroyen langhs de straten (...) Wat isser dickwils in den laten avont / ende tot / ja over den middernacht / aldertel gewoel / gejaegh / gedraef / ghesingh en gespringh van jonghe lieden / die met roepen / rasen / tieren / beeren / vloecken / sweeren / huysen schofferen / raseren / bevuylen / En. den nacht passeren / ende daer in groot playsier en vermaeck stellen” - Den Heussen (1657)

Groepjes jongeren die hangen op straat, kletsen en ogenschijnlijk niets nuttigs doen: hangjongeren zijn van alle tijden. Dergelijk rondhangen wordt in de literatuur ook wel aangeduid met ‘unstructured socializing’. Dit concept, zoals geformuleerd door Osgood et al. (1996), verwijst naar een activiteit zonder vooropgezet plan of doel die wordt ondernomen samen met leeftijdsgenoten in de afwezigheid van (volwassen) autoriteitsfiguren. Academics in de sociale wetenschappen hebben geargumenteed dat het ongestructureerd doorbrengen van tijd met vrienden zonder volwassenen in de buurt onderdeel uitmaakt van de ontwikkeling die jongeren doormaken richting volwassenheid. Het draagt bijvoorbeeld bij aan het ontwikkelen van sociale vaardigheden en een eigen identiteit (Allen en Antonishak, 2008; Giordano, 2003; Vitaro, Boivin, en Bukowski, 2009). Dat neemt niet weg dat rondhangen ook bij uitstek gelegenheid biedt voor minder wenselijk gedrag, zoals vandalisme, diefstal en andere vormen van criminaliteit.

In dit boek staat de relatie tussen rondhangen (‘unstructured socializing’) en jeugdcriminaliteit centraal. De studie bouwt voort op het theoretische en empirische werk van Osgood et al. (1996) en de literatuur die sinds dat artikel is gepubliceerd over de relatie tussen rondhangen en jeugdcriminaliteit. Het doel van dit boek is om de relatie tussen rondhangen en jeugdcriminaliteit verder uit te werken, zowel theoretisch, als methodologisch, als empirisch. Dat doe ik door onderliggende processen te onderzoeken die de relatie

mogelijk *verklaren*, door innovatieve methoden voor data verzameling toe te passen om de relatie empirisch beter te *toetsen* en door situationele condities te bekijken die de relatie mogelijk *specificeren*.

In de analyses is gebruik gemaakt van data over tijdsbesteding en jeugdcriminaliteit die zijn verzameld onder ruim 800 Nederlandse jongeren (11 tot 20 jaar oud, verzameld binnen het SPAN project) en onder ruim 16.000 Amerikaanse jongeren (10 tot 17 jaar oud, verzameld binnen het PROSPER Peers project). Deze jongeren werden benaderd via de middelbare school waar ze op dat moment waren ingeschreven. Twee innovatieve methoden voor dataverzameling, namelijk de ‘space-time budget methode’ (een soort dagboek) en systematische sociale observaties, werden toegepast in combinatie met meer traditionele methodes om de operationalisatie van het concept voor rondhangen (‘unstructured socializing’) te verbeteren en om omstandigheden te bekijken waaronder rondhangen sterker en minder sterk samenhangt met jeugdcriminaliteit.

Rondhangen en jeugdcriminaliteit

Sinds de publicatie van Osgood et al. in 1996 is er in de sociologische en criminologische literatuur in toenemende mate aandacht geweest voor het concept van unstructured socializing. Hoofdstuk 1 geeft een theoretisch en empirisch overzicht van deze literatuur op basis van een systematische literatuuronderzoek. Bijna alle 74 studies die zijn opgenomen in het literatuuroverzicht vonden een positieve relatie tussen rondhangen (unstructured socializing) en criminaliteit. Dit bevestigt de robuustheid van de relatie voor verschillende onderzoeksmethodes, stadia binnen de adolescentie, soorten delinquentie en landen. De relatie wordt tevens bevestigd in de empirische studies die worden beschreven in dit boek. Toch komen er uit het overzicht in hoofdstuk 1 ook een paar gebieden naar voren waarop verder onderzoek nodig is. Ten eerste is er weinig bekend over factoren die de relatie kunnen verklaren. Ten tweede kan de operationalisatie van het concept ‘unstructured socializing’ nog verder worden verbeterd. Ten derde weten we nog weinig over situationele factoren die de relatie specificeren.

Waarom hangt rondhangen samen met jeugdcriminaliteit?

Om met het eerste hiaat in de bestaande literatuur te beginnen: Waarom is rondhangen eigenlijk gerelateerd aan verhoogde risico's op criminaliteit? In hoofdstuk 2 worden vier potentiële verklaringen voor dit verband geopperd en vervolgens empirisch getoetst. Om tot deze verklaringen te komen is het unstructured socializing perspectief van Osgood et al. (1996) theoretisch geïntegreerd met verschillende andere theorieën en perspectieven. Ten eerste wordt verondersteld, gebaseerd op de routine activiteiten theorie (Cohen en Felson, 1979), dat rondhangen jongeren blootstelt aan gelegenheden voor criminaliteit, door het gebrek aan structuur en toezicht. Vervolgens wordt verondersteld, gebaseerd op de sociale leertheorie (e.g., Akers, 1998; Burgess en Akers, 1966) en situationele benaderingen over de invloed van leeftijdsgenoten (e.g., Dishion et al., 1996; Warr, 2002), dat rondhangen jongeren blootstelt aan groepsprocessen die hen motiveren tot criminaliteit en dat het rondhangen hen meer tolerant maakt ten opzichte van criminaliteit. Ten slotte wordt beargumenteerd, gebaseerd op ideeën over settings waarin ouders samenkomen (Felson, 2003) en over hoe 'conventionele' jeugd elkaar ontmoet tijdens gestructureerde activiteiten (Eccles et al., 2003), dat rondhangen jongeren blootstelt aan delinquente leeftijdsgenoten, wat weer hun eigen delinquente gedrag beïnvloedt. De resultaten suggereren dat alle processen, direct of indirect, de relatie tussen rondhangen en jeugdcriminaliteit verklaren. Door veel rond te hangen 1) worden jongeren blootgesteld aan verleidingen, i.e. gelegenheden, om betrokken te raken bij criminaliteit 2) worden jongeren blootgesteld aan delinquente leeftijdsgenoten, wat er weer voor zorgt 3) dat jongeren meer worden blootgesteld aan delinquente groepsprocessen en 4) dat jongeren toleranter worden ten opzichte van criminaliteit. Deze processen verklaren samen voor een groot deel de verschillen en veranderingen in jeugdcriminaliteit bij de onderzochte jongeren.

Metten van de setting waarin jongeren rondhangen

In hoofdstukken 3 en 4 worden de sterke en zwakke punten besproken van twee onderzoeksmethoden die veelbelovend lijken voor het meten van settings waarin jongeren rondhangen. De eerste methode, besproken in hoofdstuk 3, is de space-time budget methode (Wikström en Butterworth, 2006; Wikström et al., 2012). Bij deze methode worden voor vier dagen retrospectief per uur de activiteiten en locaties van respondenten uitgevraagd. Omdat het dagboek zowel de activiteiten van respondenten gedetailleerd in kaart brengt, als ook de personen die bij die activiteiten aanwezig zijn, is de methode zeer bruikbaar voor het operationaliseren van rondhangen. Bovendien geeft de methode een overzicht van de locaties waar respondenten zich bevinden gedurende de vier dagen. Dit maakt een meer uitgebreid onderzoek naar invloed van omgeving op gedrag mogelijk, waarbij niet alleen wordt gekeken naar de woonbuurt, maar ook naar de buurten waar jongeren hun tijd doorbrengen.

De tweede methode, besproken in hoofdstuk 4, is systematische sociale observatie (Perkins, Meeks, en Taylor, 1992; Perkins en Taylor, 1996; Taylor, Gottfredson, en Brower, 1984). Deze methode is toegepast om fysieke en sociale wanorde binnen straatsegmenten te observeren. Dit zijn kenmerken van de fysieke omgeving die van invloed kunnen zijn op delinquent gedrag. Het onderzoek dat wordt gepresenteerd in dit hoofdstuk is vooral gericht op observator bias: kenmerken van observatoren (zoals of ze in een stad of op het platteland zijn opgegroeid) beïnvloeden mogelijk hun perceptie van wanorde. Dit heeft gevolgen voor geaggregeerde maten van wanorde als men onvoldoende rekening houdt met de toewijzing van observatoren aan verschillende buurten. Dit hoofdstuk presenteert een nieuw model dat direct corrigeert voor observator bias in ecologische (geaggregeerde) constructen. Het gepresenteerde model is een verfijning van het ecometrics model van Raudenbush en Sampson (1999). De toepassing van het model heeft gevolgen voor de relatie tussen de mate van wanorde in een gebied en criminaliteitscijfers zoals gerapporteerd door de politie.

Onder welke omstandigheden hangt rondhangen sterker of minder sterk samen met jeugdcriminaliteit?

Om te specificeren onder welke omstandigheden rondhangen sterker, en minder sterk, is gerelateerd aan delinquentie worden drie situationele condities onder de loep genomen. Hoofdstukken 5, 6 en 7 behandelen, respectievelijk, de functionele locatie waar jongeren rondhangen (zoals een winkelcentrum, op straat, of bij een vriend thuis), achterstand in buurten waar jongeren rondhangen, en de kenmerken van de vrienden waarmee jongeren rondhangen.

Functionele locatie

Wat betreft de functionele locatie waar jongeren rondhangen (hoofdstuk 5) is de verwachting dat rondhangen sterker is gerelateerd aan criminaliteit als het plaatsvindt in locaties met weinig sociale controle. De mate van sociale controle die in een locatie aanwezig is, hangt af van de mate waarin mensen zich verantwoordelijk voelen voor een locatie. Mensen voelen zich bijvoorbeeld heel verantwoordelijk voor wat er in hun huis gebeurt (privé ruimte), maar minder voor wat er op straat gebeurt (openbare ruimte). Om hypothesen op te stellen over welke locaties specifiek erg criminogeen zijn, is Felson's classificatie (1995) over verantwoordelijkheid voor locaties geïntegreerd met het unstructured socializing perspectief (Osgood et al., 1996). In lijn met deze hypothesen vinden we dat rondhangen in privé ruimtes minder sterk gerelateerd is aan criminaliteit dan rondhangen in semi-openbare en openbare ruimtes. Meer specifiek vinden we dat rondhangen in recreatie- en uitgaansgelegenheden, op straat en in open ruimten gerelateerd is aan toenames in gerapporteerde criminaliteit, maar rondhangen in winkelcentra, openbaar vervoer en overige semi-openbare locaties, zoals scholen en verenigingen, niet. Deze resultaten kunnen mogelijk worden verklaard met het toezicht dat door winkeliers, werknemers in het openbaar vervoer (e.g., een tramconducteur) en werknemers bij andere semi-openbare locaties (e.g., conciërge) wordt uitgeoefend op groepjes rondhangende jongeren. Dit is tot dusver nog speculatie, maar het is mogelijk dat die beroepsgroepen ingrijpen wanneer een groepje jongeren te luidruchtig wordt, of tekenen vertoont van delinquent gedrag. Daarmee hebben deze mensen dus potentieel een belangrijke (schaduw)rol als toezichthouder.

Achterstand in de buurt

Is rondhangen in achterstandsbuurtten sterker gerelateerd aan criminaliteit dan rondhangen elders? Om deze vraag te beantwoorden, is het unstructured socializing perspectief (Osgood et al., 1996) in hoofdstuk 6 theoretisch geïntegreerd met de sociale desorganisatie theorie (Sampson, Raudenbush, en Earls, 1997; Shaw en McKay, 1942) en broken windows theorie (Wilson en Kelling, 1982). Sociale desorganisatie in een buurt is het onvermogen en de onwil van buurtbewoners om sociale controle te handhaven in hun woonomgeving. In buurten met hoge desorganisatie is het daarom onwaarschijnlijk dat buurtbewoners toezicht zullen houden op de groepjes jongeren die daar rondhangen. Jongeren voelen zich daardoor minder beperkt in hun doen in laten, wat zich mogelijk vertaalt naar crimineel gedrag. Op een zelfde manier kunnen tekenen van wanorde worden gezien als een signaal dat ongepast gedrag wordt getolereerd in een bepaalde buurt; dat het niemand wat kan schelen (Wilson en Kelling, 1982). Tekenen van wanorde geven daarmee het signaal af dat deviant gedrag niet wordt bestraft. In deze studie worden zeven indicatoren van sociale desorganisatie onderzocht, sociaal economische status, etnische heterogeniteit, mobiliteit onder buurtbewoners, percentage één-ouder gezinnen, bevolkingsdichtheid, hoogbouw en collectieve effectiviteit, evenals een indicator voor de mate van fysieke wanorde in een buurt. Van deze indicatoren blijkt alleen collectieve effectiviteit, i.e. sociale cohesie en sociale controle onder buurtbewoners, relevant voor de relatie tussen rondhangen en criminaliteit: rondhangen in buurten met lage scores op collectieve effectiviteit is sterker gerelateerd aan criminaliteit dan rondhangen in andere buurten. Dit impliceert dat wanneer jongeren rondhangen in buurten waar bewoners geen controle kunnen of willen handhaven, de activiteit sterker gerelateerd is aan criminaliteit.

Delinquente vrienden

Is 'rondhangen met de verkeerde vrienden' inderdaad gerelateerd aan een verhoogd risico op criminaliteit en drugsgebruik? De rol van vrienden waarmee jongeren rondhangen (hoofdstuk 7) is getheoretiseerd vanuit situationele benaderingen over de invloed van leeftijdsgenoten (e.g., Dishion et al., 1996; Warr, 2002) en literatuur over samenplegen (e.g., Warr, 1996). Op

basis van die literatuur wordt verondersteld dat leeftijdsgenoten een jongere kunnen stimuleren tot delinquentie 1) door bevestigend te reageren op delinquent gedrag en daarmee het idee te scheppen dat zulk gedrag wenselijk is (in de Engelse literatuur heet dit ‘reinforcement’) 2) door het initiatief te nemen voor delinquent gedrag 3) door zijn of haar status te bedreigen en daarmee een (agressieve) reactie te provoceren, of 4) door simpelweg aanwezig te zijn en daarmee bij te dragen aan groepsgedrag waarbij individuele verantwoordelijkheden verzwakken. De meest waarschijnlijke kandidaten voor het ‘reinforcen’, initiatief nemen of provoceren, zijn de vrienden die zelf betrokken zijn bij criminaliteit, de ‘risico-zoekers’, de vrienden die tolerant zijn ten opzichte van regelovertreding en de vrienden die wat ouder zijn dan de rest. Resultaten suggereren dat vooral delinquentie van vrienden relevant is: rondhangen met vrienden die drugs gebruiken, stelen, vandalisme plegen, of geweld plegen, vergroot de kans dat een jongere zelf ook zulk gedrag gaat vertonen. De andere onderzochte kenmerken van vrienden (risico zoeken, attitudes, leeftijd) lijken minder relevant voor de relatie tussen rondhangen en criminaliteit.

Concluderend

Door het ontrafelen van verklarende processen en het specificeren van versterkende omstandigheden vergroot dit boek onze kennis over *waarom* en onder *welke omstandigheden* rondhangen samenhangt met jeugdcriminaliteit. Het boek draagt daarmee bij aan een beter begrip van wat er nu eigenlijk zo onwenselijk is aan jongeren die rondhangen.



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Appendices



Appendices

Appendix A

Table A1. Operationalization of the three elements of unstructured socializing with space-time budget data

Three elements	Code labels in space-time budget interviews
Unstructured activities	Activities defined as unstructured are: Shopping for fun; hanging around (doing nothing, not necessarily alone, but no socializing, e.g., waiting in line)*; transport (going from A to B, including biking and walking around with friends); walking or biking around without a goal*; roller blading, skating, ice skating, skate boarding; BMX biking (for hobby, not transport); internet (surfing); moped/scooter/quad (for hobby, not transport) ^b ; playing outside on a playground, on the horizontal bar, etc.; other hobbies or games (e.g., playing with toys, dancing in the room, romping around); talking over the phone; communication by e-mail or instant messaging; texting; going to a party, including house party's*; going out (e.g., in a pub or a club)* ^a ; media consumption general; combination of socializing (e.g. by instant messaging, face-to-face communication and texting)*; watching a movie (on television, DVD, or in the cinema); reading comics; reading a magazine; reading the newspaper; reading a book (not for homework); listening to music/radio; socializing (not organized)*; talking (face-to-face), socializing*; going to a birthday party*; socializing and having a drink*; watching television; paying a visit; having break during a school day ^b .
Peers who are present	Peers (general code), partner (male), partner (female), partner and one male peer; partner and one female peer, partner and two or more male peers, partner and two or more female peers, partner and both male and female peers, one male peer, one female peer, two or more male peers, two or more female peers, both male and female peers.
Family members and other people classified as authority figures	These people had to be absent to count an hour as unsupervised: Mother, father, both parents, family (general code), other adult family members (uncle, aunt, grandpa, grandma, adult cousins, godparents), combinations of adult family members and other family members, teacher, sports trainer, other trainer, supervisor, mother or father of friend, adult neighbors, partner of parents, partner of other family member, janitor, employer, religious leader, other (e.g., doctor, dentist), parents of friends, psychologist/therapist, family member of friend, hairdresser/ beauty therapist, other adults, combinations of trainers, employers or other adults.

NOTES: In Chapter 2, findings of additional models are presented in which a strict definition of 'unstructured' was applied to operationalize unstructured socializing. The included activities according to this strict definition are marked with asterisks.

^aIn the Netherlands, there are no age limits for going to a pub (although there are for ordering alcoholic beverages). Going out is therefore on itself not rule breaking behavior.

^bThe activities 'having a break during a school day' and 'riding on a moped/scooter/quad for hobby' were included in the most recent study, presented in Chapter 6. These activities were not included in the earlier studies, presented in Chapters 2 and 5.

Appendix B

Method of systematic literature review

The goal of the systematic literature review was twofold: The first goal was to investigate whether the unstructured socializing-delinquency relationship was robust across respondents from different backgrounds, based on ethnicity, country, urbanization and gender. The second goal was to explore what factors explain (mediate) and specify (moderate) the unstructured socializing-delinquency relationship.

Systematic literature search

The literature search was conducted in two steps. As a first step, in the spring of 2015, three search engines were searched through for studies with 'unstructured socializing' as a general search topic (Criminal Justice Abstracts, Web of Science, and Sociological Abstracts). These searches resulted in 37 unique studies. Based on a reading of the abstract and in some cases a scan through the main text, 21 of those studies were considered to be relevant. The other studies did not meet the inclusion criteria, often because they only concerned victimization and not delinquent behavior. As a second step, a backward search was conducted in these 21 key studies by looking up all potentially relevant studies that the key studies referred to. The new studies were also read and searched through for potentially interesting papers and so on. This process continued until no other relevant studies were found. The literature search resulted in 74 unique publications.

Inclusion criteria

- Population: All studies that empirically studied a relationship (even if only investigated as bivariate correlation) between unstructured socializing and some type of delinquency or substance use. Studies that only addressed victimization and not delinquent behavior were excluded.
- Only those studies were included that operationalized the unstructured socializing concept with at least one of the three conditions (presence peers,

absence adults, unstructured activity), while at least one other condition was implied. Studies were excluded if they measured only 'unsupervised time' (e.g., Coley, Morris, and Hernandez, 2004; Stoolmiller, 1994) or only 'unstructured activities' (e.g., Feinstein, Bynner, and Duckworth, 2006; Mahoney and Stattin, 2000; Mahoney, Stattin and Lord, 2004). A few studies measured only 'time spent with peers' (e.g., Agnew, 1991; Meldrum, Young, and Weerman, 2009; Vásquez and Zimmerman, 2014; Weerman, 2011; Weerman and Hoeve, 2012), which admittedly is not the same as unstructured socializing. Nevertheless, those studies were retained, as the presence of peers is an important element in the unstructured socializing concept for explaining adolescent delinquency, and because a large part of this time is expected to be unsupervised; items were included referring to whether time spend with peers was at home or away from home. Further, studies were excluded that used the unstructured socializing concept only as part of a larger (lifestyle) construct (e.g., Patterson, Dishion and Yoerger, 2000; Svensson and Pauwels, 2010; Wikström and Svensson, 2008).

- The review was limited to individual level studies: Studies where both the variable for delinquency and the variable for unstructured socializing were at a higher aggregation level than the individual were excluded (e.g., Sampson and Groves, 1989).
- The review was limited to empirical studies: Meta studies or other literature reviews were excluded.
- Only English publications were included.
- The review did not exclude studies based on the age of the respondents. Thus, studies on children and adults were explicitly 'allowed'.
- Academic (peer reviewed and non-peer reviewed) journal articles were included, as well as academic books and book chapters. Dissertations were only included if 'unstructured socializing' was treated as a central topic of study, not if it was included only as control variable. Master theses were excluded.
- There was no explicit time period to which the literature search was limited, although the first step of the search strategy resulted mostly in publications that appeared after the publication of Osgood et al. in 1996, as they coined the term 'unstructured socializing'.

Table B1. Summary of studies included in the systematic literature review

Author(s)	Research project and sample	Category of operationalization of unstructured socializing ^a	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
Agnew (1991)	National Youth Survey (USA) N: 1725 Age: 11-17 No. of waves: 1	Category 1	O: minor delinquency, serious delinquency Mo: delinquent friends minor, delinquent friends serious	<ul style="list-style-type: none"> US → (+) O (both) Mo: US*serious dq friends → (NS) O (both) Mo: US*minor dq friends → (NS) O (both)
Agnew and Petersen (1989)	Project among high school students in suburban Dekalb County in Georgia (USA) N: 599 Age: 14-19 No. of waves: 1	Category 1 (3 measures: social activities; hanging out/loafing; leisure spend with peers regardless of nature activity)	O: delinquency total, minor delinquency, serious delinquency IV: variety of leisure activities Med: parental attachment, teacher attachment, grades, lifestyle expectations, acceptance of conventional beliefs, acceptance of deviant beliefs, association with deviant friends, parental disapproval of friends	<ul style="list-style-type: none"> US(all 3) → (+) total dq US (social act.) → (+) minor dq US (hanging, time w. peers) → (+) serious dq Med: social activities → all mediators (simultaneously added to model) → minor dq, partial mediation Med: time with peers → all mediators (simultaneously added to model) → serious dq, partial mediation Med: hanging → all mediators (simultaneously added to model) v serious dq, full mediation
Anderson (2003)	Add Health (USA) N: 17,890 Age: 13-19 No. of waves: 1	Category 1 (2 measures: one at individual level, one at school level)	O: violence, property offending, heavy alcohol use, marijuana use Mo (individual level): gender, income, private transportation, residential area, density residential area, dilapidation residential area	<ul style="list-style-type: none"> US (individual) → (+) O (all 4) US (school) → (+) violence, alcohol use, marijuana use Mo: US(individual)*density → (NS) O (all 4) Mo: US(school)*density → (NS) O (all 4) Mo: US(individual)*dilapidation → (NS) O (all 4) Mo: US(school)*dilapidation → (NS) O (all 4) Mo: US(school)*land use → (NS) alcohol and marijuana use Mo: US(school)*rural → (-) violence, property delinquency Mo: US(school)*urban → (+) violence, property delinquency Mo: US(individual)*land use → (NS) violence, alcohol use, marijuana use Mo: US(individual)*mixed land use → (+) property delinquency Mo: US(individual)*gender → (NS) violence, property delinquency

Continuation of Table B1

Author(s)	Research project and sample	Category of operationalization of unstructured socializing ^a	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
Anderson and Hughes (2009)	Add Health (USA) N: 17,890 Age: 13-19 No. of waves: 1	Category 1 (2 measures: one at individual level, one at school level)	O: violent offending, property offending, heavy alcohol consumption, marijuana use Mo: gender	<ul style="list-style-type: none"> Mo: US(individual)*male → (+) marijuana use, alcohol use Mo: US(individual)*private transportation → (NS) property delinquency, marijuana use, alcohol use Mo: US(individual)*private transportation → (+) violence (among the respondents with high rates of US, youth who drove some number of miles had higher offending rates than youths who did not drive) Mo: US(individual)*income → (NS) violence, marijuana use, alcohol use Mo: US(individual)*income → (+) property delinquency (US had a steeper slope for youth without a disposable income)
Augustyn and McGloin (2013)	Add Health (USA) N: 6574 Age: 13-19 No. of waves: 2	Category 1	O: predatory delinquency, substance use Mo: gender	<ul style="list-style-type: none"> US (individual) → (+) O (all 4) US (school) → (+) violent offending, marijuana use US (school) → (NS) property offending, heavy alcohol use US → (+) O (both) Mo: US*males → (+) predatory dq. Mo: US*gender → (NS) substance us
Barnes et al. (2007)	Study among Western New York State households (USA) N: 606 Age: 15-18 No. of waves: 1	Category 1	O: alcohol use, cigarette use, illicit drug use, delinquency Mo: gender, age, SES, race (white/black), family time	<ul style="list-style-type: none"> US → (+) O (all 4) Mo: US*gender → (NS) O (all 4) Mo: US*age → (NS) O (all 5) Mo: US*SES → (NS) O (all 5) Mo: US*white → (+) O (alcohol use, cigarette use, illicit drug use) Mo: US*race → (NS) delinquency Mo: US*family time → (NS) O (all 4)

Author(s)	Research project and sample	Category of operationalization of unstructured socializing ^a	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
Bernasco et al. (2013b)	SPAN (the Netherlands) N: 76 offenders Age: 12-17 No. of units: 4949 hours awake	Category 2	O: offending Med: alcohol use, cannabis use, carrying weapons	<ul style="list-style-type: none"> • US(3 separate conditions) → (+) O • US(interaction) → (+) O • Med: US → alcohol use, cannabis use, weapon carrying → O, no mediation (NS)
Bernburg and Thorlindsson (2001)	National Survey (Iceland) N: 3260 Age: 15-16 No. of waves: 1	Category 1	O: property offending, violence Mo: family commitment, school attachment, peer property offending, peer violence, definitions favorable to property offending, definitions favorable to violent behavior Med: peer property offending, peer violence, school bonding, family commitment, definitions favorable to property offending, definitions favorable to violent behavior	<ul style="list-style-type: none"> • US → (+) O (both) • Mo: US*family commitment → (-) O (both) • Mo: US*school attachment → (-) O (both) • Mo: US*peers' delinquency → (+) O (both) • Mo: US*definitions favorable to dq → (+) O (both) • Med: US → mediators (added to model in pairs) → O (both), partial mediation
Bernburg and Thorlindsson (2007)	National Survey (Iceland) N: 6458 Age: 15-16 No. of waves: 1	Category 1	O: delinquency (individual and school level) Mo (individual level): embeddedness in social ties Mo (school level): community instability (residential mobility, family disruption)	<ul style="list-style-type: none"> • US → (+) O • Mo: US*embeddedness → (-) O • Mo: US*community instability → (+) O
Boman (2013)	Rochester Youth Development Study (USA) N: 670 Age: 11-23 No. of waves: 9	Category 1	O: crime Mo: age (middle adolescence, late adolescence, emerging adulthood) Med: friend deviance	<ul style="list-style-type: none"> • US → (+) O • Med: US → friend deviance → crime, partial mediation (only during middle adolescence and emerging adulthood, not during late adolescence) • Mo: US*middle adolescence → (+) O
Chen et al. (2008)	Telephone interviews in California (USA) N: 1534 Age: 15-20 No. of waves: 1	Category 1	O: driving under influence (DUI)	<ul style="list-style-type: none"> • US → (+) O

Continuation of Table B1

Author(s)	Research project and sample	Category of operationalization of unstructured socializing ^a	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
DiPietro and McGloin (2012)	PHDCN (USA) N: 1799 Age: 9-19 No. of waves: 1	Category 1	O: violence Mo: immigrant generational status	<ul style="list-style-type: none"> • US → (+) O • Mo: US*immigrant generational status → (+) O (but evidence was not consistent)
Felson et al. (2012)	Second Nebraska Inmate Study (USA) N: 695 Age: adults No. of waves: 21224 person-months	Category 1	O: assault, property crime, dealing drugs	<ul style="list-style-type: none"> • US → (+) O (all)
Flannery, Williams, and Vazsonyi (1999)	Project among three middle schools from a medium-sized southwestern school district (USA) N: 1170 Age: 11-13 No. of waves: 1	Category 1	O: aggression, delinquency, substance use	<ul style="list-style-type: none"> • US → (+) O
Fleming et al. (2008)	Raising Healthy Children Project (USA) N: 776 Age: 11-15 No. of waves: 4	Category 1	O: delinquency	<ul style="list-style-type: none"> • US → (+) O
Gage et al. (2005)	Health Behavior of School-aged Children Survey (UA) N: 14,310 Age: 11-16 No. of waves: 1	Category 1	O: physical fighting, weapon carrying, alcohol use, cigarette smoking Mo: gender, parental involvement in school, parent-child communication, neighborhood safety, extracurricular activity	<ul style="list-style-type: none"> • US → (+) O (all) • Mo: US*gender → (NS) O • Mo: US* low parental involvement in school → (+) O • Mo: US*difficult parent-child communication → (+) O (only for boys) • Mo: US*neighborhood unsafety → (+) O • Mo: US*few days in extracurricular activity → (+) O (only for girls)

Author(s)	Research project and sample	Category of operationalization of unstructured socializing*	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
Galambo and Maggs (1991)	Two-Earner Family Study (Canada) N: 112 Age: 11-12 No. of waves: 2	Category 1 (2 measures: unsupervised time hanging out, peer involvement)	O: problem behavior Mo: gender, lax/firm parental control, parental acceptance, parent-adolescent conflict	US (both) → (+) O Mo: US (unsupervised time)*girls → (+) O Mo: US (unsupervised time)*parental control → (-) O (only for girls) Mo: US (unsupervised time)*parental acceptance → (-) O (only for girls) Mo: US (unsupervised time)*parent-adolescent conflict → (NS) O
Gardner, Roth, and Brooks-Gunn (2009)	PHDCN (USA) N: 1344 Age: 9-17 No. of waves: 3	Category 1	O: violent delinquency, nonviolent delinquency Mo: prior externalizing problem behavior	US → (+) O (nonviolent dq, not investigated for violent dq), only investigated for boys Mo: US*prior behavior → (NS) O (nonviolent dq)
Goldstein, Eccles, and Davis-Kean (2005)	Maryland Adolescent Development in Context Study (USA) N: 1357 Age: 12-17 No. of waves: 3	Category 1	O: problem behavior Mo: gender, racial group (African American and European American)	US → (+) O Mo: US*sex → (NS) O Mo: US*racial group → (NS) O
Gottfredson, Cross, and Soule (2007)	Programs included in the Maryland After-School Opportunity Fund Program (USA) N: 497 adolescents in 35 after-school programs Age: 10-17 No. of waves: 2	Category 1 (2 measures, both at level of after-school program)	O: delinquency, substance use (individual level)	US (both) → (NS) O (both)
Greene and Banerjee (2009)	Project among two schools in northeastern US (USA) N: 248 Age: 11-15 No. of waves: 1	Category 2	O: cigarette smoking Med: delinquent peers, cigarette offers from peers, smoking expectations	US → (+) O Med: US → delinquent peers → O, no mediation (NS) Med: US → cigarette offers → O, mediation Med: US → smoking expectancies → O, no mediation (NS)

Continuation of Table B1

Author(s)	Research project and sample	Category of operationalization of unstructured socializing ^a	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
Hawdon (1996)	Monitoring the Future (USA) N: 3140 Age: 17-19 No. of waves: 1	Category 1	O: marijuana use IV: structured routine activity patterns Med: peer marijuana use, religiosity, commitment (students' attitudes toward school, educational aspirations), attachment (attachment to parents), belief (belief in criminal justice system)	<ul style="list-style-type: none"> • Med: US → delinquent peers → cigarette offers → O, mediation • Med: US → delinquent peers → smoking expectancies → O, mediation • Total model: full mediation • US → (+) O • Med: US → peer marijuana use and religiosity (simultaneously added to model) → O, partial mediation • Med: US → indicators of commitment, attachment and belief (simultaneously added to model) → O, no mediation
Hawdon (1999)	Study among first-year students of a large southern university (USA) N: 108 Age: 17-18 No. of waves: 1	Category 1	O: delinquency, multiple drug use, larceny theft	<ul style="list-style-type: none"> • US → (+) O (all)
Hay and Forrest (2008)	National Longitudinal Study of Youth (USA) N: 779 Age: 12-14 No. of waves: 1	Category 1 (4 measures: children's report of unsupervised time away from home, children's report of time with peers, children's report of adult absence when returning from school, mother's report of unsupervised time away from home)	O: crime Mo: self-control	<ul style="list-style-type: none"> • US (all) → (+) O • Mo: US (children and mothers report of unsupervised time) *low self-control → (+) O • Mo: US (time with peers, adult absence) *low self-control → (NS) O

Author(s)	Research project and sample	Category of operationalization of unstructured socializing*	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
Haynie and Osgood (2005)	AddHealth (USA) N: 8838 Age: 12-20 No. of waves: 2	Category 1	O: delinquency Mo: minor peer delinquency, serious peer delinquency	• US → (+) O • Mo: US*peer delinquency → (NS) O
Higgins and Jennings (2010)	National evaluation of the G.R.E.A.T. program (USA) N: 407 Age: 12-16 No. of waves: 5	Category 2	O: delinquency	• US → (+) O
Hirschi (1969)	Richmond Youth Project (USA) N: 1300-1539 Age: 12-18 No. of waves: 1	Category 1 (2 measures: time talking with friends, riding around in a car)	O: delinquency	• US → (+) O
Hughes and Short (2014)	Data from study of street gangs in Chicago 1959-1962 (USA) N: 490 Age: 12-21 No. of waves: 1	Category 1 (4 measures: hanging in the streets, riding around in cars, attending house or quarter parties in the area, summary measure)	O: general delinquency, fighting Med: signifying	• US (all) → (+) O (both) • Med: hanging in the streets → signifying → O (fighting), full mediation • Med: attending parties → signifying → O (fighting), partial mediation • Med: riding around in cars → signifying → O (fighting), no mediation (NS)
Hundley (1987)	Project among Ontario students (Canada) N: 2048 Age: 14.5 No. of waves: 1	Category 1	O: substance use, delinquent behavior	• US → (+) O (both)
Janssen et al. (2015)	SPAN (the Netherlands) N: 603 Age: 11-19 No. of waves: 2	Category 3	O: delinquency	• US → (+) O

Continuation of Table B1

Author(s)	Research project and sample	Category of operationalization of unstructured socializing ^a	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
Junger and Wiegiersma (1995)	Project among high school students in Groningen (the Netherlands) N: 1328 Age: 13-15 No. of waves: 1	Category 1	O: deviance	<ul style="list-style-type: none"> US → (+) O
LaGrange and Silverman (1999)	University of Alberta Juvenile and Adolescent Behavior Study (Canada) N: 2095 Age: 11-18 No. of waves: 1	Category 1 (2 measures: together with friends, driving around)	O: general delinquency, property offenses, violence, drug offenses Mo: impulsivity, risk-taking, carelessness, temper, present oriented	<ul style="list-style-type: none"> US (both) → (+) O (general delinquency) US (both) → (NS) O (drug offenses) US (together with friends) → (+) O (violence) US (together with friends) → (NS) O (property offenses) US (driving around) → (+) O (property offenses) US (driving around) → (NS) O (violence) <p>Impulsivity</p> <ul style="list-style-type: none"> Mo: US (driving around)*impulsivity → (+) O (drug offenses) Mo: US (driving around)*impulsivity → (NS) O (general delinquency, property offenses, violence) Mo: US (together w. friends)*impulsivity → (NS) O (all) <p>Risk taking</p> <ul style="list-style-type: none"> Mo: US (driving around)*risk taking → (+) O (drug offenses) Mo: US (driving around)*risk taking → (NS) O (general delinquency, property offenses, violence) Mo: US (together w. friends)*risk taking → (+) O (violence) Mo: US (together w. friends)*risk taking → (+) O (general delinquency, property offenses, drug offenses)

Author(s)	Research project and sample	Category of operationalization of unstructured socializing ^a	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
				Carelessness <ul style="list-style-type: none"> Mo: US (driving around)*carelessness → (+) O (drug offense) Mo: US (driving around)*carelessness → (NS) O (general delinquency, property offenses, violence) Mo: US (together w. friends)*carelessness → (NS) O (all)
				Other indicators of self-control <ul style="list-style-type: none"> Mo: US (both)* temper → (NS) O (all) Mo: US (both)* present oriented → (NS) O (all)
Lam, McHale, and Crouter (2014)	Penn State Family Relationships Project (USA) N: 402 Age: 8-18 No. of waves: 5	Category 1	O: youth problem behaviors Mo: gender, gender composition of peer group (opposite/mixed-gender or same-gender)	<ul style="list-style-type: none"> US → (+) O Mo: US*mixed-gender peer group → (+) O Mo: US*gender → (NS) O
Lotz and Lee (1999)	Monitoring the Future (USA) N: 2772 Age: 18-19 No. of waves: 1	Category 1	O: property delinquency, violent crime, vandalism, smoking, drinking Mo: race (African American, white), gender	<ul style="list-style-type: none"> US → (+) O Mo: US*race → (NS) O Mo: US*male → (+) vandalism Mo: US*gender → (NS) property delinquency, violent crime, smoking, drinking
Maimon (2009)	PHDCN (USA) N: 824-2360 Age: 8-18 No. of waves: 3	Category 1	O: violent offending Mo (neighborhood level): collective efficacy	<ul style="list-style-type: none"> US → (+) O Mo: US* high collective efficacy → (-) O
Maimon and Browning (2010)	PHDCN (USA) N: 842 Age: 8-18 No. of waves: 3	Category 1	O: violent offending Mo (individual level): impulsivity Mo (neighborhood level): collective efficacy	<ul style="list-style-type: none"> US → (+) O Mo: US* high collective efficacy → (-) O Mo: US*impulsivity → (NS) O

Continuation of Table B1

Author(s)	Research project and sample	Category of operationalization of unstructured socializing ^a	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
McGloin and Sherner (2009)	Add Health (USA) N: 7415-9997 Age: 12-18 No. of waves: 2	Category 1	O: delinquency Mo: peer deviance, self-control	<ul style="list-style-type: none"> • US → (+) O • Mo: US*peer deviance → (-) O (only for girls) • Mo: US*peer deviance*self-control → (NS) O
McHale, Crouter, and Tucker (2001)	Penn State Family Relationships Project (USA) N: 198 Age: 10 to 12 No. of waves: 2	Category 1 (3 measures: hanging out, outdoor play, free time spent in unsupervised peer contexts)	O: conduct problems Med: time spent in unsupervised peer contexts	<ul style="list-style-type: none"> • US (all) → (+) O • Med: hanging out → time spent in unsupervised peer contexts → O, full mediation (but not straightforward results)
Meldrum, Barnes, and Hay (2015)	Study of Early Child Care and Youth Development (USA) N: 825 Age: 12-15 No. of waves: 2	Category 1	O: delinquency	<ul style="list-style-type: none"> • US → (+) O
Meldrum and Clark (2015)	Project among two schools in a southeastern state (USA) N: 357-426 Age: 11-21 No. of waves: 1	Category 1	O: petty theft, major theft, vandalism, violence, trespassing, alcohol use, marijuana use	<ul style="list-style-type: none"> • US → (+) O (all)
Meldrum, Young, and Weerman (2009)	School Project (the Netherlands) N: 1364-1949 Age: 11-18 No. of waves: 2	Category 1	O: delinquency	<ul style="list-style-type: none"> • US → (+) O

Author(s)	Research project and sample	Category of operationalization of unstructured socializing ^a	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
Miller (2013)	Edinburgh Study of Youth Transitions and Crime (Scotland) N: 3064-3454 Age: 15 No. of waves: 1	Category 1 (3 measures: hanging around with friends locally, hanging around in Edinburgh city center/hang around away from home, nightlife)	O: assault, fare evasion, shoplifting, vandalism, drug use	<ul style="list-style-type: none"> US (all) → (+) O (assault) US (hanging around locally) → (+) O (shoplifting, vandalism) US (nightlife, hanging around away from home) → (NS) O (shoplifting, vandalism) US (nightlife, hanging around away from home) → (+) O (drug use) US (hanging around locally) → (NS) O (drug use) US (hanging around away from home) → (+) O (fare evasion) US (nightlife, hanging around locally) → (NS) O (fare evasion)
Moore and Ohtsuka (2000)	Five secondary schools in Melbourne (Australia) N: 769 Age: 15-18 No. of waves: 1	Category 1 (2 measures: unstructured leisure time, socializing)	O: gambling, problem gambling Mo: gender	<ul style="list-style-type: none"> US (both) → (+) O (gambling) US (both) → (NS) O (problem gambling) Mo: US*gender → (NS) O
Müller, Eisner, and Ribeaud (2013)	Zurich Project on the Social Development of Children and Youths (Switzerland) N: 1032 Age: 11-14 No. of waves: 2	Category 2	O: variety of delinquency, shoplifting, vandalism, assault	<ul style="list-style-type: none"> US → (+) O (variety of delinquency, shoplifting, vandalism) US → (NS) O (assault)
Mustaine and Tewksbury (2000)	Project among college students in 8 different states (USA) N: 1513 Age: 17→20 (about 30% is 21+) No. of waves: 1	Category 1	O: assault	<ul style="list-style-type: none"> US → (NS) O

Continuation of Table B1

Author(s)	Research project and sample	Category of operationalization of unstructured socializing ^a	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
Novak and Crawford (2010)	National Education Longitudinal Study (USA) N: 1485 Age: 15-18 No. of waves: 2	Category 1	O: delinquency Mo: gender	<ul style="list-style-type: none"> • US → (+) O • Mo: US*males → (+) O
Op de Beeck and Pauwels (2010)	Youth in Flanders. Measured and Counted (Belgium) N: 4829 Age: 11-21 No. of waves: 1	Category 1	O: general offending, petty crime, serious delinquency Mo: family strain, school strain, loss strain	<ul style="list-style-type: none"> • US → (+) O • Mo: US*family strain → (-) O (general offending) • Mo: US*school strain → (-) O (general offending) • Mo: US*family/school strain → (NS) O (petty crime, serious delinquency)
Osgood and Anderson (2004)	National evaluation of the G.R.E.A.T. program (USA) N: 4358 within 36 schools Age: 13-15 No. of waves: 1	Category 2 (both at individual and school level)	O: delinquency (both at individual and school level)	<ul style="list-style-type: none"> • US (individual) → (+) O • US (school) → (+) O
Osgood et al. (1996)	Monitoring the Future (USA) N: 1782-1840 Age: 18-26 No. of waves: 5	Category 1 (4 measures: ride around in a car or motorcycle just for fun; get together with friends informally; go to parties or other social affairs; during a typical week, on how many evenings do you go out for fun and recreation)	O: criminal behavior, heavy alcohol use, marijuana use, use of other illicit drugs, dangerous driving	<ul style="list-style-type: none"> • US (all) → (+) O (alcohol and marijuana use) • US (driving around, go to parties, evenings out for fun) → (+) O (criminal behavior) • US (get together with friends) → (NS) O (criminal behavior) • US (get together with friends, go to parties, evenings out for fun) → (+) O (other drug use) • US (driving around) → (NS) O (other drug use) • US (driving around, evenings out for fun) → (+) O (dangerous driving) • US (get together with friends, go to parties) → (NS) O (dangerous driving)

Author(s)	Research project and sample	Category of operationalization of unstructured socializing ^a	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
Pettit et al. (1999)	Child Development Project (USA) N: 438 Age: 12-13 No. of waves: 2	Category 1	O: externalizing problems Mo: parental monitoring, neighborhood safety	<ul style="list-style-type: none"> US → (+) O Mo: US*parental monitoring → (-) O Mo: US*neighborhood safety → (-) O Mo: US*parental monitoring*neighborhood safety → (-) O: lowest level of externalizing problems for high monitored adolescents from safe neighborhoods who report low amounts of US
Posner and Vandell (1999)	Project in Milwaukee elementary schools (USA) N: 194 Age: 8-11 No. of waves: 3	Category 3 (2 measures: unstructured outdoor activities, socializing)	O: behavior problems Mo: race	<ul style="list-style-type: none"> US (outdoor activities) → (+) O US (socializing) → (NS) O Mo: US (outdoor activities)*white → (+) O
Regnerus (2002)	Add Health (USA) N: 1648 Age: 13-19 No. of waves: 2	Category 1	O: theft, minor delinquency Mo: age group (two groups), No. of delinquent friends, proportion of delinquent friends, mean delinquency among friendship group (delinquency of friends matched to DVs)	<ul style="list-style-type: none"> US → (+) O (both) Mo: US* younger → (+) O (theft) Med: US → friends' delinquency (3 measures) → O (both), no mediation (NS)
Riley (1987)	National survey (England and Wales) N: 751 Age: 14-15 No. of waves: 1	Category 3	O: offending Med: peer-group commitment	<ul style="list-style-type: none"> US → (+) O Med: US → peer-group commitment → O, partial mediation
Sentse et al. (2010)	TRAILS (the Netherlands) N: 1023 Age: 10-14 No. of waves: 2	Category 1	O: antisocial behavior Mo: gender, antisocial friends	<ul style="list-style-type: none"> US → (+) O Mo: US* boys → (+) O Mo: US* antisocial friends → (+) O

Continuation of Table B1

Author(s)	Research project and sample	Category of operationalization of unstructured socializing ^a	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
Smith and Ecob (2013)	Edinburgh Study of Youth Transitions and Crime (Scotland) N: 4300 Age: 13-17 No. of waves: 6	Category 1 (2 measures: hanging about, spare-time activities)	O: serious offending, general offending	• US (both) → (+) O (both)
Staff et al. (2010)	Monitoring the Future (USA) N: 1000-3500 Age: 13-19 No. of waves: 2-3	Category 1	O: delinquency, marijuana use, heavy drinking	• US → (+) O (all)
Steketee (2012)	International Self Report Study of Delinquency-2 (31 countries in Europe, USA and Latin America) N: about 67,000 Age: 12-16 No. of waves: 1	Category 1 (5 measures: hanging out with friends, going out at night, time with 1-3 friends/larger group, time with friends in public places, lifestyle of frequently hanging out with large group in public places)	O: serious offending, delinquency versatility Mo: gender	• US (first 4 measures) → (+) serious offending • US (lifestyle) → (+) delinquency versatility • Mo: US* gender → (NS) O
Sun and Longazel (2008)	Project among college classes in one mid-Atlantic public university (USA) N: 558 Age: 18-26 No. of waves: 1	Category 1 (2 measures: going to parties, getting together with friends informally)	O: binge drinking, drinking-driving, negative alcohol related behaviors (e.g., police contact, getting into fights)	• US (going to parties) → (+) O (all) • US (getting together with friends) → (NS) O (all)

Author(s)	Research project and sample	Category of operationalization of unstructured socializing ^a	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
Svensson and Oberwittler (2010)	Halmstad School Survey, MPI Youth Survey (resp. Sweden and Germany) N: 880 (Sweden), 879 (Germany) Age: 15-16 (Sweden), 13-16 (Germany) No. of waves: 1	Category 1	O: offending Mo: delinquent friends	<ul style="list-style-type: none"> US → (+) O (in both samples) Mo: US*delinquent friends → (+) O (in both samples)
Thomas and McGloin (2013)	Add Health, National evaluation of the G.R.E.A.T. program, Monitoring the Future data (all USA) N: 8989 (Add Health), 1172 (G.R.E.A.T.), 2809 (Monitoring the Future) Age: 10-22 (Add Health), 13-19 (G.R.E.A.T.), 18-26 (Monitoring the Future) No. of waves: 2-4	Category 2	O: delinquency Mo: impulsivity	<ul style="list-style-type: none"> US → (+) O (in all samples) Mo: US*impulsivity → (NS) O (inconsistent findings across samples and research designs, no strong support for interaction)
Thorlindsson and Bernburg (2006)	National survey (Iceland) N: 3431 Age: 15-16 No. of waves: 1	Category 1	O: alcohol use, hashish use Mo: peer alcohol use, positive peer attitude towards alcohol use, peer hashish use, positive peer attitude toward hashish use	<ul style="list-style-type: none"> US → (+) O (both) Mo: US*peer alcohol use → (+) O (alcohol use) Mo: US*peer attitudes tow. alcohol use → (+) O (alcohol use) Mo: US*peer hashish use → (+) O (hashish use) Mo: US*peer attitudes tow. hashish use → (+) O (hashish use)
Vásquez and Zimmerman (2014)	National Youth Survey (USA) N: 1543 Age: 13-20 No. of waves: 2	Category 1	O: drug delinquency, property delinquency, violent delinquency	<ul style="list-style-type: none"> O (all) → (+) US

Continuation of Table B1

Author(s)	Research project and sample	Category of operationalization of unstructured socializing ^a	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
Vazsonyi et al. (2002)	International Study of Adolescent Development (Hungary, the Netherlands, Switzerland, USA) N: 6914 Age: 15-19 No. of waves: 1	Category 1	O: vandalism, alcohol, drug use, school misconduct, general deviancy, theft, assault	<ul style="list-style-type: none"> US → (+) O (all)
Wallace and Bachman (1991)	Monitoring the Future (USA) N: 77500 Age: 17-19 No. of waves: 1	Category 1	O: tobacco use, alcohol use, marijuana use, cocaine use	<ul style="list-style-type: none"> US → (+) O (all)
Weerman (2011)	School Study (the Netherlands) N: 1156 Age: 11-18 No. of waves: 2	Category 1 (2 measures: time with peers, being part of an informal street-oriented youth group)	O: delinquency	<ul style="list-style-type: none"> US (part of informal street-oriented group) → (+) O US (time spent with peers) → (NS) O
Weerman et al. (2013)	SPAN (the Netherlands) N: 843 Age: 12-17 No. of waves: 1	Category 3 (2 measures: time with peers unsupervised, time with peers mainly socializing)	O: delinquency Mo: physical time with peers, virtual or online time with peers, time with peers in public places, time with peers not in public, time with peers supervised, time with peers not socializing, time with peers exposed to alcohol/drugs, time with peers not exposed to alcohol/drugs, time with two or more peers, time with one peer	<ul style="list-style-type: none"> US (both) → (+) O Mo: US*public location → (+) O (time spent with peers is related to delinquency only when it combines at least two of the conditions just socializing, being in public, being unsupervised)
Weerman and Hoeve (2012)	School Study (the Netherlands) N: 1110 Age: 11-18 No. of waves: 2	Category 1	O: delinquency Mo: gender	<ul style="list-style-type: none"> US → (+) O Mo: US*boys → (+) O

Author(s)	Research project and sample	Category of operationalization of unstructured socializing ^a	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
Weerman et al. (2015)	SPAN (the Netherlands) N: 616-843 Age: 11-20 No. of waves: 2	Category 1	O: delinquency Mo: gender	US → (+) O Mo: US*gender → (NS) O
West and Farrington (1977)	Cambridge Study in Delinquent Development (England) N: 389 Age: 18-19 No. of waves: 1	Category 1 (2 measures: hanging about on the streets, driving motor vehicle)	O: delinquents/nondelinquents	O → (+) US (both)
Wikström and Butterworth (2006)	Peterborough Youth Study (England) N: 1957, 339 subsample Age: 14-15 No. of waves: 1	Category 3 (2 measures: peer-centeredness, time spent in high-risk public environments)	O: offending, offending prevalence, offending frequency Mo: gender, risk score (balanced score, protective score)	US → (+) O Mo: US (time spent in high-risk public environments)*girls → (+) O (offending prevalence) Mo: US (time spent in high-risk public environments)*girls → (NS) O (offending frequency) Mo: US (peer-centeredness)*balanced risk score → (+) O (offending)
Wikström et al. (2010)	Peterborough Adolescent and Young Adult Development Study (England) N: 716 Age: 13-17 No. of waves: 5	Category 3 (2 measures: unsupervised with peers in areas of low collective efficacy, unsupervised with peers in areas with public entertainment)	O: crime Mo: crime propensity (composite of morality and low self-control)	US (both) → (+) O Mo: US (both)*crime propensity → (+) O

Continuation of Table B1

Author(s)	Research project and sample	Category of operationalization of unstructured socializing ^a	Outcome (O); independent variables if relevant (IV); mediators (Med); moderators (Mo)	Main findings regarding the unstructured socializing (US)-delinquency/substance use (O) relationship ^b
Wikström et al. (2012a)	Peterborough Adolescent and Young Adult Development Study (England) N: 657-716 Age: 13-17 No. of waves: 5	Category 3 (3 measures: time spent in unstructured peer-oriented activities in areas of low collective efficacy, in areas with public entertainment, combined measure)	O: crime, crime rates across hours Mo: crime propensity (composite of morality and self-control), peer crime involvement, collective efficacy in the area, functional location (local centers-city centers; on the streets and in parks-moving around), time of day (evenings-during the day)	<ul style="list-style-type: none"> US (all) → (+) O (crime) Mo: US (combined measure)*peer crime involvement → (+) O (crime) Mo: US (combined measure)*crime propensity → (+) O (crime) Mo: US *medium collective efficacy → (+) O (crime rates across hours) Mo: US *focal centers and on the streets → (+) O (crime rates across hours) Mo: US *evening → (+) O (crime rates across hours)
Wong (2005)	Survey in Western Canadian city (Canada) N: 578 Age: 9-19 No. of waves: 1	Category 1	O: total delinquency, violence, property offenses, trivial offenses IV: other leisure activities Med: differential involvement index, attachment to parents, attachment to school, attachment to peers, respect for law, delinquent association, social bond index	<ul style="list-style-type: none"> US → (+) O (all) Med: US → attachment to parents, school and peers, respect for law, delinquent association (simultaneously added to model) → O (all), full mediation (delinquent association is the most important mediating factor)
Yin, Katims, and Zapata (1999)	Study in school district in south central Texas (USA) N: 2651 Age: 13-16 No. of waves: 1	Category 1	O: delinquency Mo: gender	<ul style="list-style-type: none"> US → (+) O Mo: US*gender → (NS) O

NOTES: Only the results of the studies are displayed that concerned the direct unstructured socializing-delinquency relationship, or moderation or mediation thereof. ABBREVIATIONS: US = unstructured socializing; O = outcome/measure for delinquency or substance use; Mo = moderator/moderation; Med = mediator/mediation; IV = independent variables, only displayed if relevant; NS = non-significant; + = positive relationship found; - = negative relationship found.

^aOperationalization of unstructured socializing: Category 1: One condition measured, at least one other condition implied; Category 2: All conditions measured in stylized questionnaire-format; Category 3: All conditions measured in time diary format.

^bFull mediation refers to the direct effect being reduced to non-significance; partial mediation refers to a substantially reduced direct effect that remains significant.



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Writing this dissertation has certainly kept me from unstructured socializing, or from spending time otherwise engaged in social activities with family and friends. I would therefore like to conclude with some special thanks

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About the Author



About the Author

Evelien Hoeben (1987) is a researcher in sociology and criminology. She obtained her master in Sociology at the University of Groningen (2010, cum laude) on a study about the social networks of forensic psychiatric patients. After one year as full-time data coordinator at the NSCR, for the Study of Peers, Activities, and Neighborhoods (SPAN), she started her PhD research on that same project. The studies described in this book were part of her PhD research, which was conducted between August 2011 and September 2015. Her research interests include adolescent delinquency and substance use, peer processes, time use, and situational explanations for deviance. Evelien currently works as a postdoctoral researcher at the Sociology department of the University of Amsterdam. More information is available on: www.evelienhoeben.com.

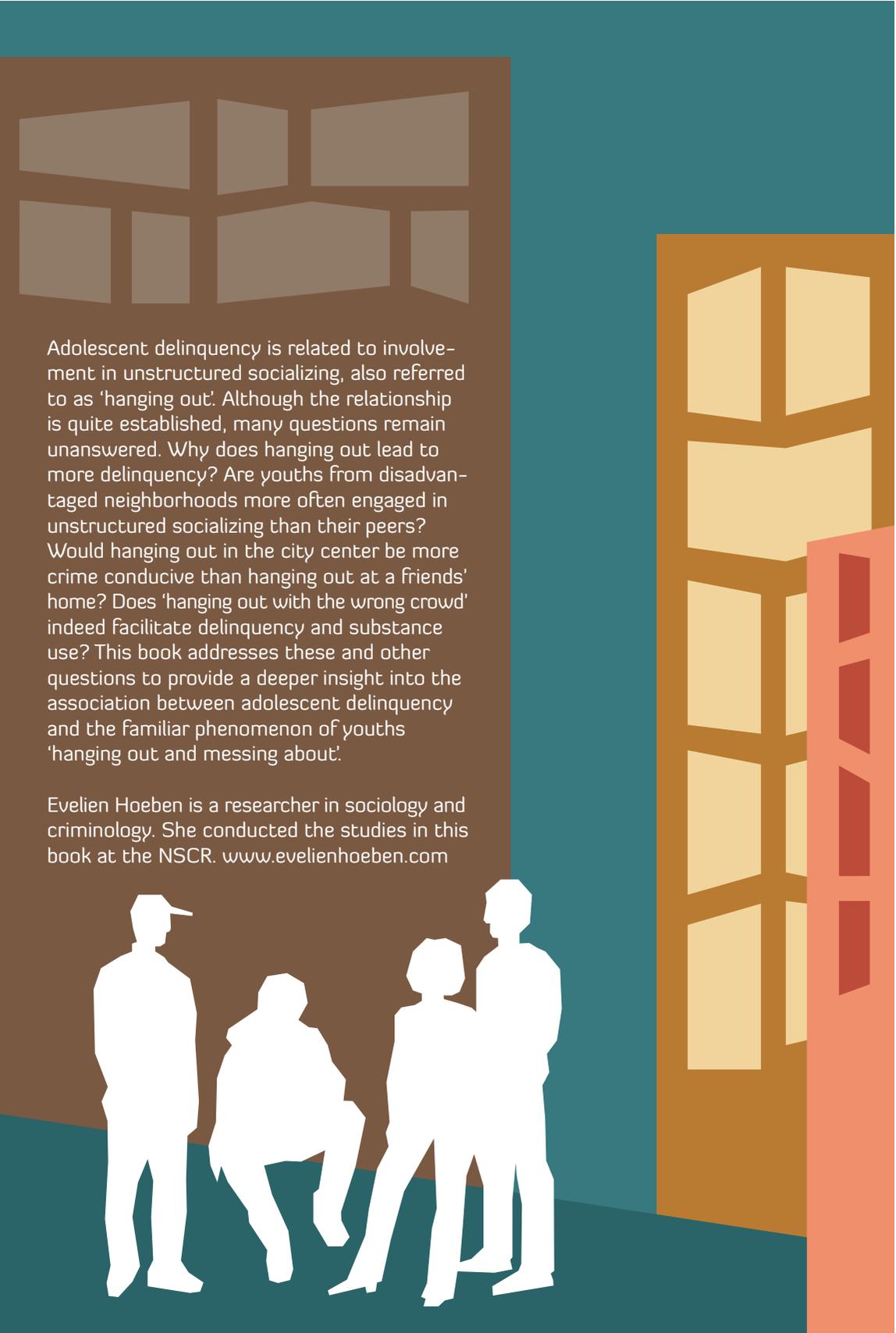
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Adolescent delinquency is related to involvement in unstructured socializing, also referred to as 'hanging out'. Although the relationship is quite established, many questions remain unanswered. Why does hanging out lead to more delinquency? Are youths from disadvantaged neighborhoods more often engaged in unstructured socializing than their peers? Would hanging out in the city center be more crime conducive than hanging out at a friends' home? Does 'hanging out with the wrong crowd' indeed facilitate delinquency and substance use? This book addresses these and other questions to provide a deeper insight into the association between adolescent delinquency and the familiar phenomenon of youths 'hanging out and messing about'.

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