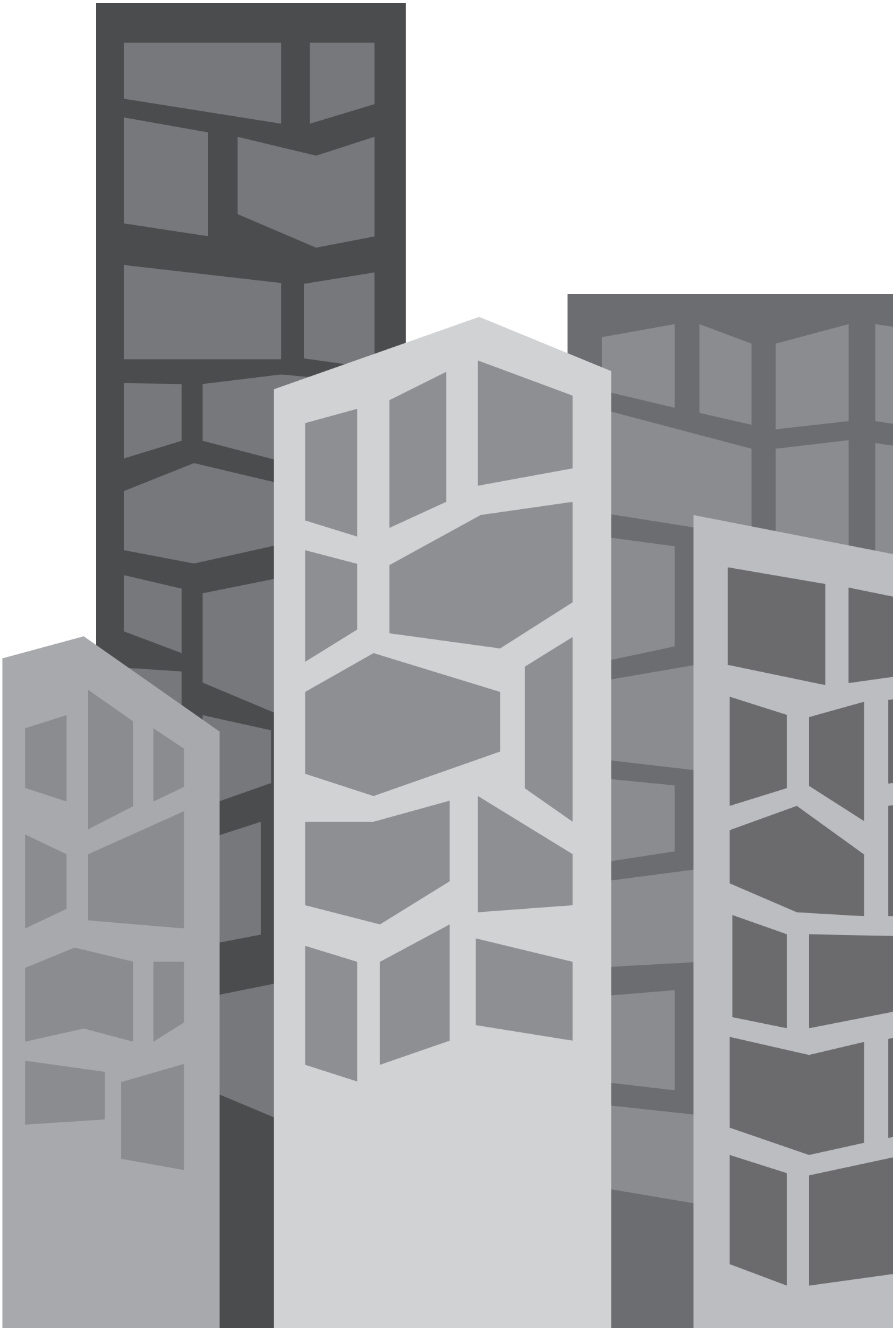

Chapter Six.

Disadvantage in the Area

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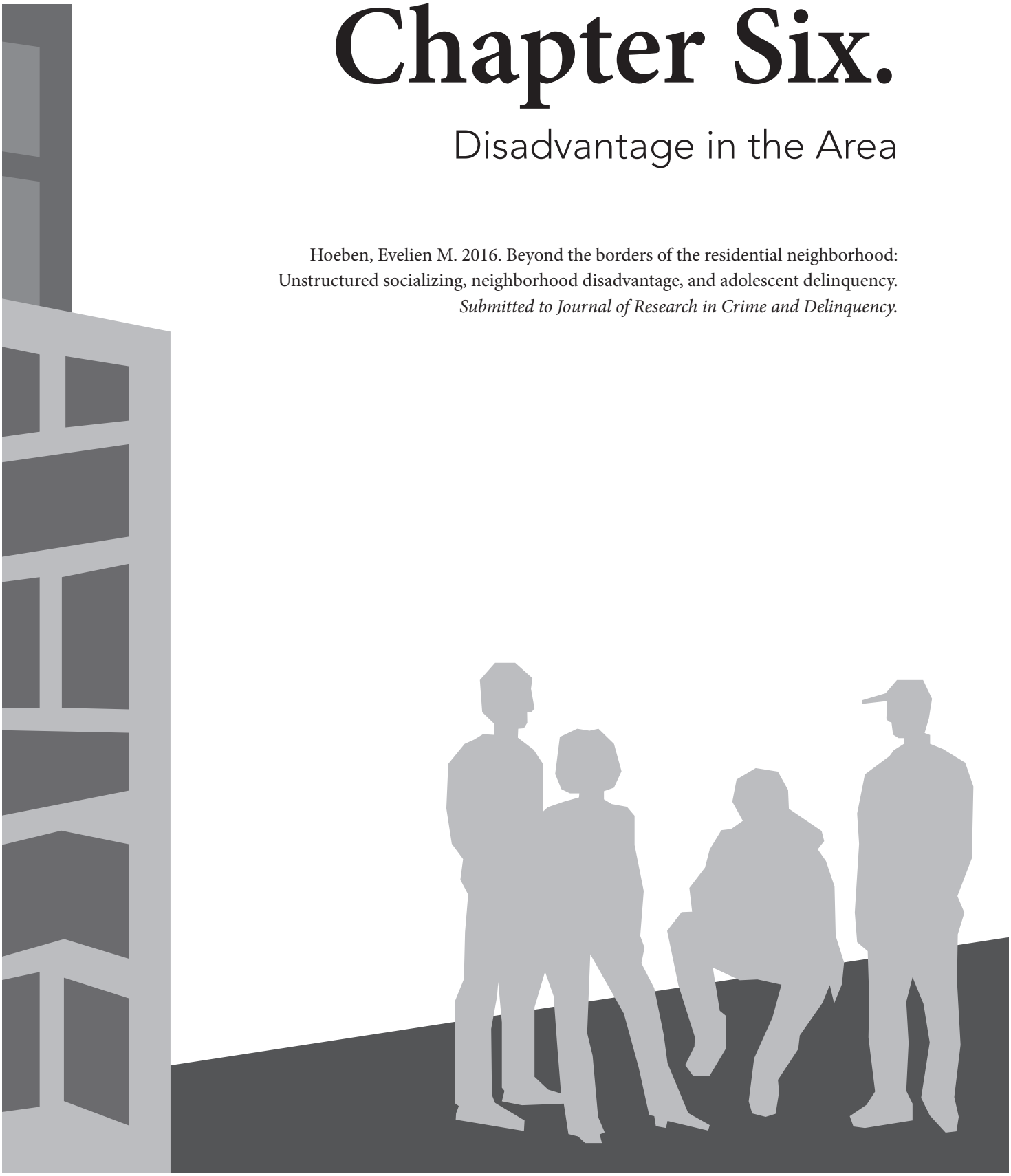

Disadvantage in the Area

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 Wiebe (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 acts[28]. 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 to13 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 km^2) 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 absent[29]. 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 municipality[30], 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 neighbor-hood[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.

[a] The 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.
[b] The 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.

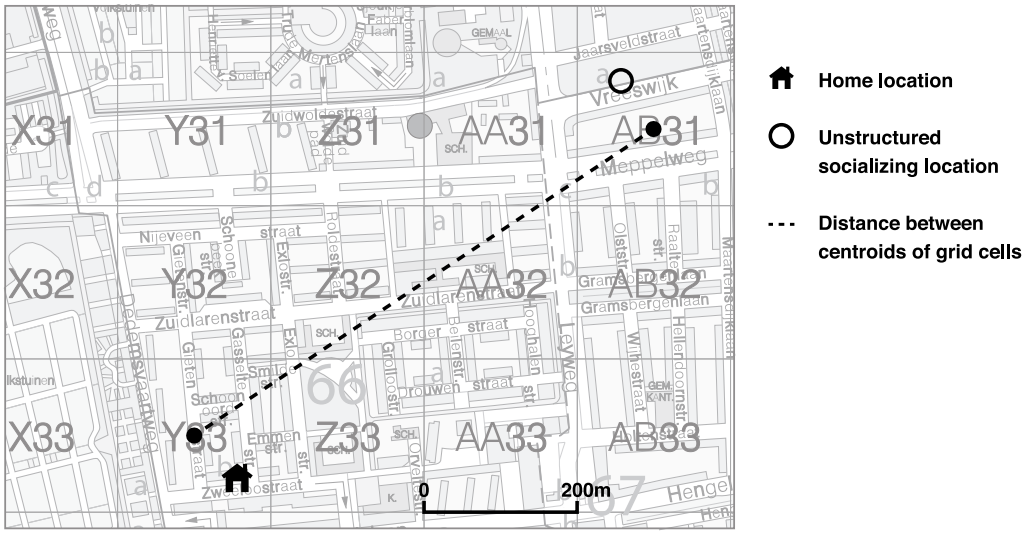

Figure 6.1. Distance estimation between home and whereabouts. The Euclidian distance was estimated as the distance in meters between the centroids of the home grid cell (here Y33) and the centroid of the grid cell where unstructured socializing took place (here AB31)

Several controls were included. Dummy variables indicated respondents' *gender* (1 = female) and *ethnicity* (1 = ethnic minority[31]). *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.
[a]The 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 unconflated 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 Unconflated 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: χ^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, β = -.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)
Neighbor-hood	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)
Neighbor-hood	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 spend 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 extent 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, Gladfelter, 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. *Answer categories: never (0); once (1); twice (2); three to five times (3); six to ten times (4); more than ten times (5).*	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: Very likely/likely/neither likely nor unlikely/unlikely/very unlikely.* (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: Totally agree/agree/do not agree nor disagree/disagree/totally disagree.* (Three items were recoded such that a high score indicated high social trust). 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.	Community survey
Physical disorder	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