Weak Ties with Strong Links: Gang Entry through School Peers' Older Brothers

Daniel Cunha Byström*

October 27, 2026

Abstract

How do criminal networks reach younger members, and what role do school peers' family ties play? I combine novel Swedish police data on participants in criminal networks with population registers covering families, schools, neighborhoods, and criminal histories. I study male students in grade 7, at ages 13–14, and leverage cohort-to-cohort variation within schools in exposure to school peers whose older brothers have prior gang-related offending. A 5 percentage point increase in exposure raises the probability of subsequently being listed in the police Gang Register by about 19 percent relative to the mean, and exposure accounts for about a tenth of all listings. Additional analyses suggest that weak ties alone can raise general offending but that entry into criminal networks depends on the strong links to peers' older brothers.

Keywords: gangs, criminal networks, weak ties, brother links, peer effects
JEL Classification: K42, J13, I24, C31

*CEP, London School of Economics; SOFI, Stockholm University.
I thank my supervisors, Randi Hjalmarsson and Mikael Lindahl, for their invaluable guidance, advice, and support throughout the development of this paper. I am also grateful to Matthew Lindquist, Manne Gerell, Elisa Jácome, Giovanni Mastrobuoni, Emily Owens, and Arizo Karimi for their helpful comments and suggestions. I thank seminar and conference participants at ESPE, TWEC, ESEC, Helsinki GSE, London School of Economics, and the University of Gothenburg. Financial support from the European Union (ERC, Police-Prisons-Firms, Grant No. 101093345) is gratefully acknowledged. The views and opinions expressed are those of the author and do not necessarily reflect those of the European Union or the European Research Council. Neither the European Union nor the granting authority can be held responsible for them. I also acknowledge funding from Stiftelsen Clas Groschinskys Minnesfond (Reference No. SF2411). This project received ethical approval from the Stockholm regional ethical review committee under project number 2023-03541-01.

1 Introduction

An estimated 400,000 juveniles join a gang each year in the United States, and about one in twenty 14-year-olds is a gang member (Pyrooz and Sweeten 2015). Recruitment at these ages has lasting consequences: it draws children into criminal careers and sustains the organizations that recruit them (Castro et al. 2025; Sviatschi 2022a,b). How do criminal organizations reach these new members? Unlike firms, they face constraints on advertising, formal screening, and assessing the trustworthiness of potential members, and they therefore rely on existing social relationships to identify and vet recruits (Densley 2012).

Research on social networks distinguishes strong ties, such as those within families, from weak ties to acquaintances, such as neighbors and schoolmates (Granovetter 1973). A large literature, mostly on labor markets, shows that both matter: strong ties carry trust and referrals (Gee et al. 2017; Kramarz and Nordström Skans 2014), while weak ties reach beyond a person's immediate circle and bring new information (Granovetter 1983; Rajkumar et al. 2022). For criminal organizations, this trade-off is sharper, since they must balance the efficiency needed to operate against the security of limiting their exposure to law enforcement (Morselli et al. 2007). Strong ties within families offer trust and make it easy to introduce new members (Brottsförebyggande rådet 2023; Hashimi et al. 2021). Weak ties reach further, and research on crime points to their importance in spreading criminal activity (Calvó-Armengol et al. 2007; Patacchini and Zenou 2008).

In this paper, I study whether weak ties formed in school draw adolescents into criminal networks. The weak tie I study is to a school peer whose older brother is involved in a gang, and it can matter through two channels. A family background of this kind may come with characteristics associated with disruptive and criminal behavior, so these peers may affect other students through their own behavior (Billings and Hoekstra 2023; Carrell et al. 2018; Carrell and Hoekstra 2010; Kristoffersen et al. 2015). I refer to this channel as behavioral influence. The same peers may also connect other students to their older brothers and the networks around them, so that a weak tie in school leads to a strong link in the peer's family (Jackson and Rogers 2007). I refer to this channel as network access. Existing research shows that exposure to delinquent or high-risk peers raises criminal behavior (Bayer et al. 2009; Billings and Hoekstra 2023; Larsen and Kristensen 2017) and that contact in schools and prisons can create criminal partnerships (Billings et al. 2019; Johnsen and Khoury 2024), but it leaves open whether exposure also connects adolescents to established criminal organizations beyond their peer group. The distinction matters for how to disrupt entry into these organizations. If peers matter only through behavioral influence, interventions can focus on the peer group itself; if they also provide network access, part of the risk lies in connections outside the group that such interventions may miss. Because both channels contribute to the same overall peer effect, I first estimate the overall effect of exposure and then examine how it varies with the availability of the strong link, the peer's older brother, and with the closeness of the weak tie in school.

I study this question in Sweden, where organized crime has grown over the past two decades and shifted toward decentralized networks rooted in local social relationships (Brottsförebyggande rådet 2016; Gerell et al. 2020; Rostami 2017; Rostami and Mondani 2023). Shootings have increased (Brottsförebyggande rådet 2021a; Sturup et al. 2019) and explosions have become more common (Sturup et al. 2020), with much of this violence attributed to conflicts between these networks (Brottsförebyggande rådet 2024; Jönsson and Nilsson 2019), often linked to local drug markets (Brottsförebyggande rådet 2021b, 2025b; Gerell et al. 2021).[1] These networks increasingly involve young people.[2] Criminal groups recruit adolescents to carry out drug-related and violent crimes (Brottsförebyggande rådet 2023; Polismyndigheten 2025; SVT 2024), and this recruitment is described as following an age structure, with individuals roughly 15 to 20 years old drawing in adolescents roughly 12 to 15 years old (Brottsförebyggande rådet 2023).[3] Because these networks are rooted in local relationships rather than formal hierarchies, they are a natural setting for studying how personal ties draw adolescents in. These developments have also drawn wide political attention (Rostami 2017) and a range of policy responses, including harsher sentences for young adults convicted of serious crimes (Regeringskansliet 2021) and new police efforts against the networks (Polismyndigheten 2021, 2025). One of these efforts is the source of the novel data I use: since 2019, the police have identified individuals they classify as active participants in criminal networks and listed 18,490 of them between 2019 and 2024 in what I refer to as the Gang Register (Polismyndigheten 2024). These records can be linked to population-wide administrative registers covering family relationships, schooling, residential location, and criminal histories, and the linked data make three things observable together: (i) network participation, as identified by the police; (ii) the older brother who defines a peer's family link; and (iii) an adolescent's later co-offenders.

Using the Gang Register, I first identify features of criminal histories that distinguish listed individuals from other offenders: an early onset of offending, offenses common in gang environments, and repeated co-offending. Because these features can be read from the dated criminal registers, the resulting classification, which I call gang-related offending, shows when an individual's offending comes to resemble that of listed individuals, including in the years before the Gang Register begins in 2019. I then study male students who enter lower secondary school in grade 7 between 2013 and 2019, at around age 13, when more than half of Swedish students move to a new school. For each student, I measure exposure as the share of his grade-7 school cohort whose older brothers had gang-related offending before

[1] Although overall homicide rates in Europe remain low relative to the Americas (Suonpää et al. 2024; UNODC 2023), the scale of narcotics trafficking (Polismyndigheten 2021), contract killings (Polismyndigheten 2025), and credible reports of foreign state involvement (Säkerhetspolisen 2024) have raised broader concerns about the expansion of organized criminal activity in Western Europe (Krüsselmann et al. 2023; SOM-institutet 2024).

[2] Appendix Figures A1 and A2 show that suspicions of narcotics offenses and of firearm-related murder rose markedly among 15- to 24-year-olds, especially from the late 2010s onward.

[3] Recruitment reportedly also takes place in schools, where students already involved in gangs recruit their schoolmates (SVT 2025).

the cohort formed, and I refer to these peers as linked peers. The empirical design compares students who attend the same school and live in the same neighborhood but enter grade 7 in different years, and who therefore meet different shares of linked peers. Within these school–neighborhood cells, students' predetermined characteristics do not jointly predict their exposure, the observed exposure shares resemble random draws from simulated cohorts, and exposure in grade 6 does not predict whether students change schools or neighborhoods when they enter grade 7.

Entering a school cohort with more linked peers raises later network participation. A 5 percentage point increase in exposure, or roughly five additional linked peers in a school cohort of about 95, raises the probability of later appearing in the Gang Register by 19% relative to the mean of 1.4%, and the probability of gang-related offending between ages 16 and 21 by 10.5% relative to the mean of 3.5%. The estimates change little when controls are added and are not driven by other peer characteristics that may be correlated with having an older brother with gang-related offending, such as sex, foreign background, or parental income, employment, or education. Aggregated over all students, exposure at its observed level accounts for about 10% of those who appear in the Gang Register. These listings occur among students without a gang-related father or older brother of their own.

To assess whether the effect reflects what linked peers do or who they know, I separate two kinds of outcomes: general offending, which includes any offense and co-offending with a linked peer, and network outcomes, which include listing in the Gang Register and co-offending with a linked peer's older brother or with another listed individual. Gang-related offending serves as a behavioral counterpart to listing: it captures offending characteristic of gang environments, whether or not the police have identified the individual. Network access predicts that the effects on network outcomes depend on whether the older brother can be reached. Under behavioral influence, the brother link would merely proxy for the linked peer's criminal home environment, so the effects should not depend on the brother's availability. Three sets of results assess this distinction. First, the increase in co-offending extends beyond the linked peers. A 5 percentage point increase in exposure raises the probability of co-offending after compulsory school with a linked peer by about 46% of the mean, with a linked peer's older brother by about 22%, and with an individual listed in the Gang Register by about 12%. The increase in co-offending with the older brother and with register members occurs mainly among students who also co-offend with the linked peer. These new relationships add to, rather than replace, the relationship with the linked peer, consistent with the linked peer acting as a bridge to his or her older brother and the network around him.

Second, the estimates reflect links to older brothers with gang-related offending rather than to criminal family backgrounds in general. Links through brothers with other criminal records yield smaller estimates, as do links through fathers with gang-related offending, which are likely a stronger signal of a criminal home environment. Both kinds of links appear

to matter mainly for narcotics offending, while violent offending and network participation follow the link to an older brother with gang-related offending. Third, the estimates for network outcomes are smaller where contact with the older brother is plausibly more limited or disrupted. When none of a linked peer's older brothers with gang-related offending lives in another municipality, a 5 percentage point increase in exposure raises co-offending with the older brother by about 38% of the mean; when all of them do, by about 3%. The other network outcomes and gang-related offending show the same decline, and the effects on network outcomes are concentrated among linked peers whose brothers are 3 to 7 years older, or about 16 to 20 when the cohort forms, the ages at which individuals are described as drawing in younger adolescents. When the brothers are in prison, these effects turn negative, although imprecisely. The estimates for general offending remain positive whether or not the brothers can be reached. Weak ties alone appear to raise general offending, while entry into criminal networks depends on the strong links to peers' older brothers.

The weak ties that lead to these strong links also differ in how much they matter. Among students with no Swedish-born parent, a 5 percentage point increase in exposure to linked peers who share the student's parental region of origin raises listing by about 48% of the mean, against about 4% for other linked peers. Exposure through same-age neighborhood peers has smaller effects, about 7% of the mean for listing against 17% to 19% for the school measure, which may reflect that contact in neighborhoods is less organized by age. Gang-related offending rises with exposure only where criminal networks are present, and the effects are concentrated among students with disadvantaged backgrounds, in particular those with low prior achievement or a single parent. Among female students, the estimates for crime are imprecise, but exposure raises mood-related diagnoses between ages 13 and 15 by about 5% of the female mean.

This paper contributes to three literatures. The first is the literature on social networks and the strength of ties discussed above. Most of this work concerns labor markets (Bayer et al. 2008; Boorman 1975; Calvó-Armengol and Jackson 2004; Dustmann et al. 2016; Montgomery 1991), where employers can also recruit through formal channels; I study a setting in which organizations cannot recruit openly. In research on crime, Calvó-Armengol et al. (2007) model how information exchanged through strong and weak ties affects crime and employment, and Patacchini and Zenou (2008) find that weak ties, measured as friends of friends, are associated with more criminal activity among U.S. adolescents. I study indirect ties from students to their school peers' older brothers, in which a weak tie leads to a strong link, use cohort-to-cohort variation in exposure to these ties, and observe whether students later offend with the brothers themselves. The effects on network outcomes are concentrated where the school tie is socially close and the brother can be reached, suggesting that weak ties in school can give adolescents access to their peers' strong family links and to the networks behind them.

The second literature studies peer effects. Peers affect educational outcomes (Carrell et al. 2009; Sacerdote 2001) and criminal behavior in correctional facilities (Bayer et al. 2009; Damm and Gorinas 2020; Johnsen and Khoury 2024; Ouss 2011; Philippe 2024; Stevenson 2017), neighborhoods (Billings and Schnepel 2020; Damm and Dustmann 2014; Dustmann and Landersø 2021), schools (Billings et al. 2019; Billings and Hoekstra 2023; Kim and Fletcher 2017; Larsen and Kristensen 2017), and co-offending networks (Lindquist and Zenou 2014).[4] The mechanisms examined in this work, such as crime-specific learning, social contagion, and the formation of criminal partnerships, operate among the peers themselves (Bayer et al. 2009; Billings et al. 2019; Damm and Gorinas 2020; Johnsen and Khoury 2024; Stevenson 2017). Studies of school peers often identify disruptive or at-risk peers by their family background, such as exposure to domestic violence or a family member's arrest, conviction, or incarceration (Billings and Hoekstra 2023; Carrell et al. 2018; Carrell and Hoekstra 2010; Gupta et al. 2022; Kristoffersen et al. 2015). Closest to this paper, Billings and Hoekstra (2023) use cohort variation in the share of peers whose parents have been arrested and find effects on achievement and adult arrests that operate mainly through schools rather than neighborhoods. In this paper, a peer's family background may also connect other students to a person outside the peer group: the linked peer's older brother, who can be identified in the data. Links through brothers with other criminal records have smaller effects, and exposure raises co-offending with the brothers and with other listed individuals, alongside co-offending with the linked peers themselves. The results suggest that peers matter through the connections they carry outside the peer group as well as through their own behavior.

Finally, the paper contributes to research on how young people enter gangs and criminal careers. Much of the research on gangs and organized crime studies established criminal organizations and their consequences.[5] Work on entry studies who joins drug-trafficking gangs in Rio de Janeiro's favelas and at what age (Carvalho and Soares 2016) and shows that childhood exposure to criminal activity, through work in illegal labor markets, the arrival of deported gang members, or neighborhood gang crime, raises later criminal involvement (Dustmann et al. 2023; Sviatschi 2022a,b). Research on crime within families documents the transmission of criminal behavior from parents to children (Besemer and Farrington 2012;

[4]For peer effects on educational outcomes more broadly, see, for example, Angrist and Lang (2004), Bifulco et al. (2011), Imberman et al. (2012), Lavy and Schlosser (2011), Lefgren (2004), and Ohinata and van Ours (2013). On school and neighborhood environments and crime, Deming (2011) finds that attending a first-choice school reduces adult crime, with suggestive evidence that peers account for more of the effect in middle school, and Ludwig and Kling (2007) find no evidence in the Moving to Opportunity experiment that lower neighborhood crime rates reduce individuals' arrests.

[5]This work studies the origins of the Italian Mafia and its influence on economic development, public funds, and politics (Acemoglu et al. 2019; Barone and Narciso 2015; Campedelli et al. 2024; Daniele and Dipoppa 2017; De Feo and De Luca 2017; Pinotti 2015); violence and territorial control by drug-trafficking organizations and gangs in Latin America and their consequences for schooling and economic development (Dell 2015; Melnikov et al. 2020; Monteiro and Rocha 2017; Sobrino 2020); and the organization, markets, and effects of gangs in the United States, including prison gangs, and policies against them (Bruhn 2021; Cook et al. 2007; Dooley et al. 2014; Grogger 2002; Levitt and Venkatesh 2000; Skarbek 2010).

Hjalmarsson and Lindquist 2012; Junger et al. 2013) and correlations in crime between siblings (Eriksson et al. 2016); having a gang-involved older sibling, particularly an older brother, predicts a younger sibling's own gang entry (Hashimi et al. 2021). Related work measures children's exposure to the justice involvement of parents and other household adults and studies the effects of parental and sibling incarceration (Bhuller et al. 2018a,b; Finlay et al. 2023; Grönqvist et al. 2024; Murray and Farrington 2008; Norris et al. 2021). This work focuses on outcomes within the family. Less is known about the social ties through which adolescents enter criminal networks, and gang involvement is often difficult to observe directly; Dustmann et al. (2023), for example, measure neighborhood gang crime with a proxy based on co-offending convictions. I observe police-identified network participation in population-wide data and study one route of entry: a family connection carried by a school peer. I find that older brothers' gang-related offending also affects unrelated adolescents, the school peers of their younger siblings, who become more likely to appear in the Gang Register and to offend with the brothers themselves. Links through older brothers matter more than links through fathers with gang-related offending, suggesting that entry into criminal networks passes between adjacent cohorts more than across generations.

Section 2 describes the setting, the data, and the measurement of gang-related offending and exposure, and Section 3 presents the empirical design and the evidence on its identifying assumptions. Section 4 reports the overall effect of exposure, Section 5 follows the strong links to the older brothers, Section 6 turns to the weak ties that lead there, and Section 7 concludes.

2 Setting, Data, and Measurement

This section describes the setting and the data. I first describe the age structure of Swedish criminal networks and how school cohorts form at the start of grade 7. I then introduce the data, the measure of gang-related offending that allows family connections to be dated before a cohort forms, and the analysis sample, exposure measure, and outcomes.

2.1 Criminal Networks and the Age Structure of Recruitment

Organized crime in Sweden has changed in character since the early 2000s. In the early 1990s, youth co-offending in Stockholm formed a large but unstable network without durable gangs (Sarnecki 2001). Hierarchical organizations such as motorcycle gangs have given way to more decentralized networks rooted in local social relationships in disadvantaged neighborhoods (Brottsförebyggande rådet 2016; Gerell et al. 2020; Rostami and Mondani 2023), alongside a sharp increase in firearm violence and in conflicts between groups (Brottsförebyggande rådet 2021a, 2024; Sturup et al. 2019). Suspicions of narcotics offenses and of firearm-

related murder have risen sharply among 15- to 24-year-olds, especially from the late 2010s onward.[6]

The rise of these groups is commonly linked to immigration and difficulties of integration, which, together with residential segregation, have concentrated socioeconomic disadvantage in particular neighborhoods (Gerell et al. 2020, 2022; Hällsten et al. 2013; Malmberg et al. 2018). This paper does not study how these networks emerged, but how, once established, they sustain and expand their membership by reaching younger cohorts. Reports from the Swedish National Council for Crime Prevention (*Brottsförebyggande rådet*, BRÅ) describe these networks as clusters of similarly aged individuals who maintain relationships across age groups, and describe recruitment that follows the same pattern: individuals roughly 15 to 20 years old draw in adolescents roughly 12 to 15 years old, typically into low-level tasks in local drug markets that shift legal and physical risk away from more established participants (Brottsförebyggande rådet 2016, 2021b, 2023). Younger participants are also less costly to use in this way, since offenders under 21 have historically faced milder sanctions than adults.[7]

What role do family ties play in these networks? Panel A of Figure 1 shows how BRÅ illustrates their structure (Brottsförebyggande rådet 2023). Individuals of similar age form clusters with frequent horizontal connections, while fewer vertical links connect these clusters across age groups, from adults to older and younger adolescents. The police describe the individuals they register in similar terms, as cooperating in crime both horizontally, between peers of the same age, and vertically, between older and younger individuals (Polismyndigheten 2024). Panel B plots a subgraph of individuals listed in the police Gang Register (described further in Section 2.3), connected by the ties observed in the administrative registers: weak ties formed in school and in the neighborhood, and strong ties to relatives. In this network, family ties often connect clusters of individuals that would otherwise be separate. Across the full network of listed individuals, of which the panel shows only a part, individuals with a family tie to another listed individual have a mean betweenness centrality more than five times as high as those without.[8] Returning to Panel A, this pattern is consistent with the vertical links between age groups being strong ties within families, and the horizontal links within age groups being weak ties formed in schools and neighborhoods.

While the family ties in Panel B include fathers, uncles, brothers, and cousins, this paper focuses on older brothers. Older brothers are much closer in age to a 13-year-old than fathers or uncles are, and are therefore more likely to be in the age range at which BRÅ describes individuals drawing in younger adolescents. They are also more likely than uncles

[6]Appendix Figure A1 and Figure A2 plot narcotics-related and firearm-related murder suspicions per 100,000 individuals by age group between 2000 and 2023.

[7]Age 21 historically marked the threshold for full adult sanctioning in Sweden; a 2022 reform lowered it to 18.

[8]Non-standardized betweenness centrality is the number of distinct shortest paths between all ordered pairs of nodes that pass through the focal node. Individuals with a family tie have a mean betweenness centrality of 66,921, compared with 12,470 for those without.

or cousins to be present in a younger sibling's daily life. Extended family could also matter but is harder to study, since uncles and cousins are inconsistently observed in the registers, particularly in families with a foreign background, which are overrepresented in the Gang Register. I therefore limit the analysis to the immediate family and define the family link through older brothers.

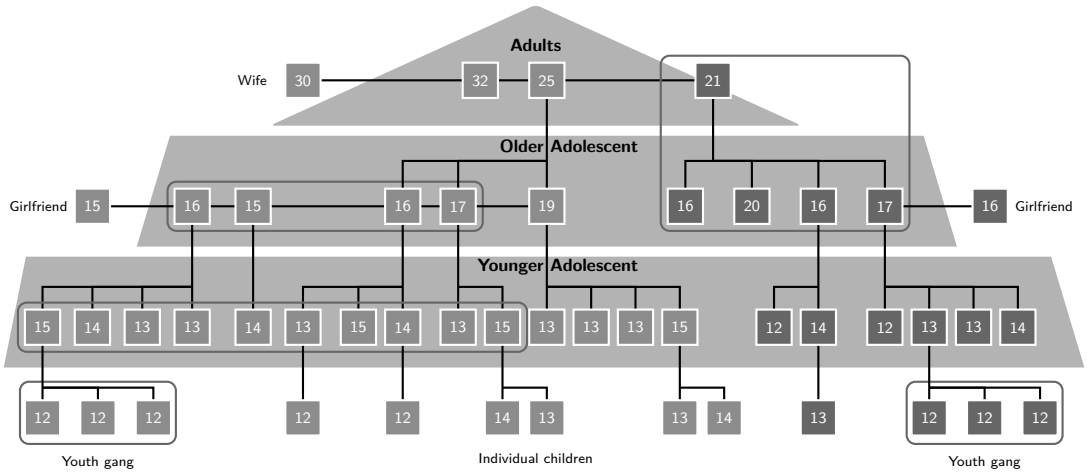
2.2 Schools and Neighborhoods as Peer Environments

Since the early 1990s, Sweden has operated a decentralized school system in which publicly funded independent schools operate alongside municipal schools. Municipal schools assign students based on residential proximity, while independent schools admit students based on queue time, proximity, or sibling priority (Björklund et al. 2004; Holmlund et al. 2020; Sjögren et al. 2024). Together with residential segregation, school choice has produced substantial differences in student composition across schools (Böhlmark et al. 2016).

Compulsory school ends with grade 9 and is typically organized in three stages, the last of which, lower secondary school, covers grades 7 to 9. Because many schools do not offer every grade, moving from one stage to the next often means moving to a new school. Schools for the early grades are typically smaller, and students from several of them continue to a larger school for grades 7 to 9, so students entering grade 7 join a cohort drawn from several earlier schools, in which some peers are familiar and others are new. Appendix Figure A3 plots the share of students in a new school in each grade, separating moves made because the previous school does not offer the next grade from moves made for other reasons. School changes are by far most common at the start of grade 7, when more than half of all students attend a new school, most of them because their previous school ends at grade 6. Smaller peaks occur in grades 4 and 6, while in grades 8 and 9 almost no students move because a grade is not offered. Residential moves remain at about 6% in every grade. The grade-7 transition thus reshuffles students' school peers without changing where they live. Because few later moves are forced by the grades a school offers, changes in a student's school peers after grade 7 are more likely to reflect families' own choices.

School and neighborhood environments overlap only partly. Residential proximity influences which school a student attends, but a school's intake area typically covers several neighborhoods, and students from the same neighborhood may attend different schools. The two environments also structure contact between adolescents differently. Schools group students by age, so the school cohort defines a clear set of same-aged peers who are in repeated contact with one another. Interactions in neighborhoods are not organized by age in the same institutional way, so the relevant peer group there is harder to pin down, and a link carried by a same-age neighbor may capture only part of it.

(a) Conceptual Illustration of the Age Structure



(b) Observed Ties Among Individuals in the Gang Register

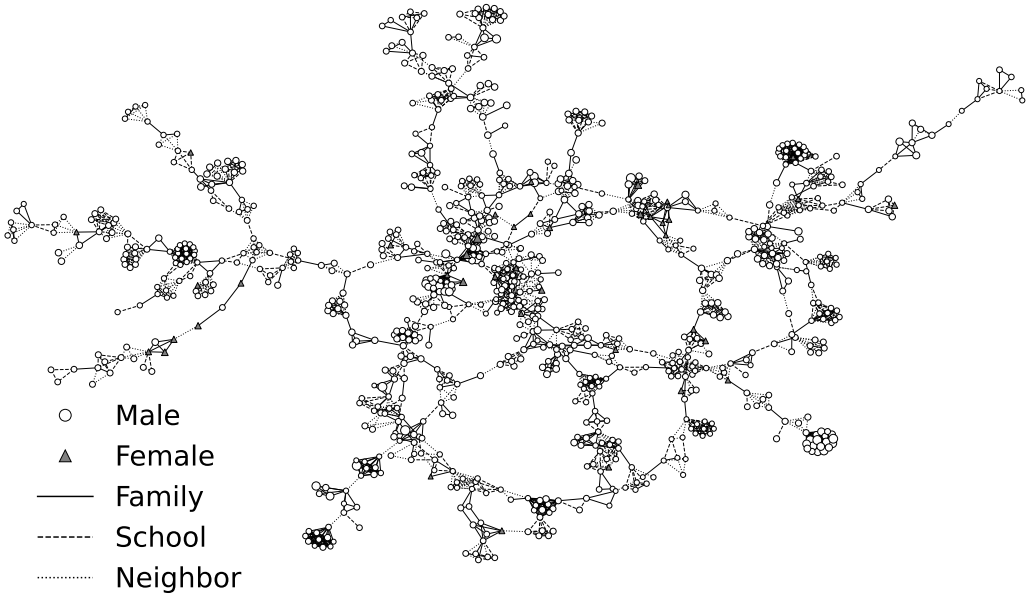


Figure 1: Gang Network Structure: Conceptual Illustration and Observed Ties

Note.—Panel A reproduces how the Swedish National Council for Crime Prevention (BRÅ) illustrates the structure of criminal networks in Sweden (Brottsförebyggande rådet 2023). Each box is an individual and the number gives his or her age; individuals of similar age form clusters, and fewer links connect the clusters across age groups. Panel B shows a subgraph of individuals listed in the police Gang Register, connected by ties observed in the population-wide administrative registers. Individuals are linked if they are relatives (solid lines), attended the same compulsory school (dashed lines), or lived in the same neighborhood (dotted lines). Node shape indicates gender, and larger nodes are older individuals. The network statistics reported in the text are computed on the full network of listed individuals, of which the panel shows a part.

2.3 Data

Studying gang entry through school peers' older brothers requires three types of data: (i) police data identifying who participates in criminal networks, (ii) criminal records showing who has offended and who has offended together, and (iii) registers linking students to their families, schools, and neighborhoods. The administrative registers cover the entire Swedish population and are held by BRÅ, Statistics Sweden, and the National Board of Health and Welfare. Personal identification numbers link individuals across all sources, which allows me to reconstruct each student's family connections to criminal activity as they stood before the police identified anyone as a network participant.

The first key data source is a police dataset known as the cylinder model (*cylindermodellen*), which I refer to as the *Gang Register*. The police introduced the model in 2019 to identify who exerts criminal influence in local communities. It lists individuals the police classify as active participants in criminal networks: those suspected, based on intelligence, of association with organized crime involving offenses punishable by at least one year in prison or committed systematically (Polismyndigheten 2024). Like police gang databases in other countries, it builds on police intelligence (Densley and Pyrooz 2020). The register covers the years 2019 to 2024. Listing does not date entry into a network; it records that the police identified the individual as active at some point during these years. I therefore use listing as an indicator of observed participation rather than as a measure of when participation began.

The second key data source consists of two BRÅ registers on criminal activity. The convictions register, available from 1975, records offenses, sanctions, and offense and conviction dates; the suspects register, available from 1995, records suspected offenses with offense and confirmation dates. Convictions often follow an earlier suspicion, but some offenses appear only in the convictions register, so I combine the two. Throughout the paper, an *offense* is an event in either register, dated by the offense date. Both registers include case identifiers, which allow me to identify co-offending. Specifically, I classify two individuals as co-offenders if they are recorded in the same case. Because the age of criminal responsibility in Sweden is 15, no offenses are recorded before that age.

The third type of data links students to their families, schools, and neighborhoods. Statistics Sweden's multigenerational register (*flergenerationsregistret*) links each individual to parents, siblings, aunts and uncles, and cousins. Annual education registers record the school and grade of every compulsory-school student from 2008 onward. Residential location is observed annually at the level of Regional Statistical Areas (*Regionala statistikområden*, RegSO). RegSOs were developed by Statistics Sweden for analyses of segregation; the 3,363 areas have roughly 650 to 23,000 residents each, and their boundaries are stable over time and drawn independently of school intake areas. Further registers provide background characteristics and additional outcomes, including country of birth and migration history,

household composition, parental income, employment, and education, school grades and test scores, and healthcare diagnoses.

2.4 Classifying Gang-Related Offending

Defining exposure requires a way to distinguish older brothers whose criminal records resemble those of network participants from older brothers with other criminal records. I therefore use the criminal registers to classify individuals as having *gang-related offending*, based on the offending patterns that separate listed individuals from other offenders.

Appendix Table A1 describes the 18,490 individuals listed in the Gang Register. Almost all are men (94%), their average year of birth is 1998, 79% have a foreign background, and 41% are born abroad. Most have a criminal record: 77% have at least one recorded offense, and 67% have offended together with at least one other person, 38% with five or more different people. Listed individuals are also often related to one another. Among those whose relatives can be observed, 23% have an older brother who is also listed, compared with 3% for fathers, 6% for uncles, and 10% for older cousins.

Appendix Figure A4 shows that the offending of listed individuals differs from that of other offenders in three respects. First, it starts earlier: about nine in ten listed offenders have their first recorded offense by age 21, compared with fewer than half of other offenders. Second, it more often includes offenses that are common in gang environments. Following BRÅ's description of such offenses (Brottsförebyggande rådet 2023), I define *gang-common offenses* as murder, weapons possession, aggravated narcotics offenses, robbery, coercion, and extortion. About 72% of listed offenders have at least one such offense, compared with about 11% of other offenders. Third, it involves repeated co-offending in ordinary crime categories. On their own, assault, property, and non-aggravated narcotics offenses are not specific to gang environments, since the same legal categories cover, e.g., a bar fight or youth theft. Committing them repeatedly with others is a stronger signal of networked offending: about 59% of listed offenders have co-offended at least twice in these categories, compared with about 7% of other offenders. Appendix Table A2 reports the underlying offense frequencies by listing status. Comparative research in Europe and the United States defines a street gang as "any durable, street-oriented youth group whose involvement in illegal activity is part of its group identity" (Esbensen and Maxson 2012). The offending of listed individuals reflects several elements of this definition: it starts early, commonly includes offenses typical of street crime, and is often committed with others.

The classification combines these three margins. An individual has gang-related offending if the first recorded offense occurs by age 21 and the individual either (i) has at least one gang-common offense or (ii) has co-offended at least twice in assault, property, or non-aggravated narcotics offenses. Figure 2 shows what each part of the rule contributes. In Panel (a), a classification based on offense types alone captures 97% of listed offenders but also 58% of other offenders. Adding the onset and repeated co-offending restrictions in Panel

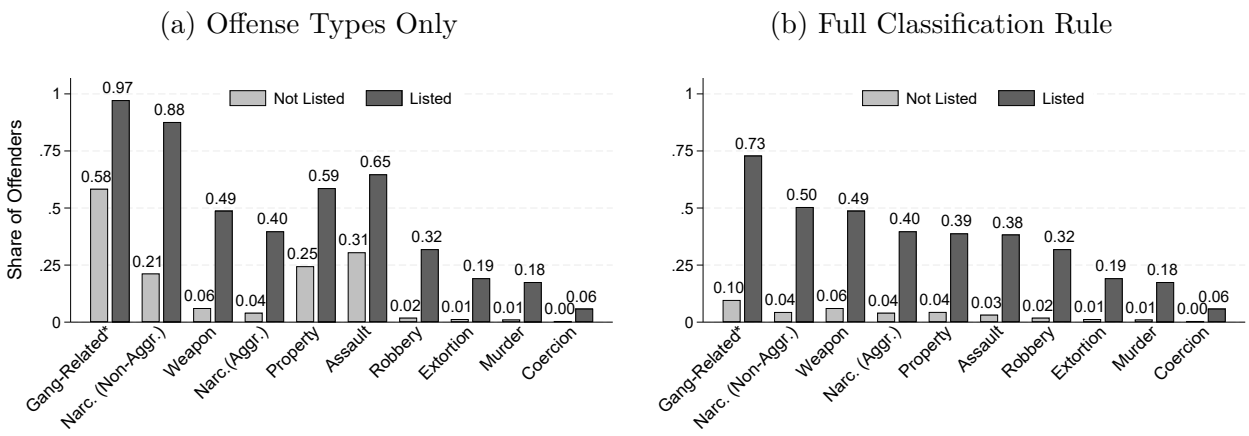


Figure 2: Classifying Gang-Related Offending: Listed versus Other Offenders

Note.—Each bar shows the share of offenders with at least one recorded offense in a crime category, separately for offenders listed and not listed in the Gang Register. Panel (a) counts every offense. Panel (b) applies the full rule that defines gang-related offending: the first recorded offense must occur by age 21, and non-aggravated narcotics, assault, and property offenses count only for offenders with at least two co-offenses across these three categories. The first bar (Gang-Related*) gives the share with at least one offense in any of the categories, which in Panel (b) is the share classified as having gang-related offending. The rule is selected to distinguish listed from other offenders. The sample covers offenses committed between 2007 and 2023; 2007 is the first year in which offenses count toward qualifying relatives, for the earliest cohort entering grade 7 in 2013. Appendix Figure A4 reports the three margins from which the rule is constructed.

(b) retains 73% of listed offenders while reducing the share of other offenders classified as gang-related to 10%.

The classification serves two purposes. First, it defines treatment. Students whose older brother has gang-related offending are linked peers, and their share in a school cohort defines exposure. Because every offense in the criminal registers is dated, I can determine whether an older brother meets the classification before the focal student enters grade 7. Listing in the Gang Register is observed only from 2019, after most cohorts in the sample have entered grade 7, and dates police registration rather than entry into a network.

Second, applied to the focal students' own offending between ages 16 and 21, the classification provides an outcome that complements Gang Register listing. Listing is the primary outcome, since it is the most direct measure of network participation available. However, because the register builds on police intelligence, listing may also depend on where the police look and which individuals they monitor; a student connected to individuals the police already follow, for example, may be identified more readily for the same level of involvement. Gang-related offending is based on recorded offenses rather than on a police assessment of network participation, and thus depends less on police discretion. It also captures individuals who may have been missed by the police or who were active only before the register began in 2019. For the same reasons, I also report effects on violent, property, and narcotics offending.

2.5 Sample, Exposure, and Outcomes

I construct the analysis sample in three steps. (i) I select all students observed in grade 7 between 2013 and 2019 who are 12 to 14 years old at the start of the school year, which accommodates both early starters and grade repeaters, and who remain alive and resident in Sweden through grade 9. (ii) I link each student to parents and siblings through the multigenerational register, and merge demographic, socioeconomic, school, residential, and criminal records for the student and each relative. (iii) I restrict the relatives' criminal histories to offenses committed from the year the student turns seven through the calendar year before the student enters grade 7. The resulting data contain 675,194 students from the 2000–2006 birth cohorts, attending 2,159 schools and living in 3,361 neighborhoods.

Exposure is built from a single indicator. For student j in grade 7 at school s in year t, let $D_{jst} = 1$ if j has at least one older brother with gang-related offending before j enters grade 7. The indicator records a family connection, so neither j nor the students exposed to j need have committed any offense. Because the age of criminal responsibility in Sweden is 15, an older brother who meets the classification before j enters grade 7 is at least three years older than j. When the cohort forms, he has therefore typically left lower secondary school, so the other students in the cohort meet j in school, but not his older brother. I refer to students with $D_{jst} = 1$ as *linked peers*. For a focal student i, exposure is the leave-one-out share of linked peers in his school cohort:

$$\text{Brother-Link Exposure}_{ist} = \frac{\sum_{j \neq i} D_{jst}}{N_{st} - 1}, \tag{1}$$

where N_{st} is the number of students in grade 7 at school s in year t. Exposure is computed over all students in the school cohort regardless of sex, so a boy can be exposed through a girl whose older brother has gang-related offending. On average, linked peers make up 2.5% of a student's school cohort, or about two of the roughly 95 other students (Appendix Table A3). The paper also uses versions of this measure based on fathers, neighborhood peers, older cohorts, and older brothers with different offending histories.

The main analysis focuses on male students, since 94% of listed individuals are men; I analyze female students separately. I also exclude students whose own father or older brother has prior gang-related offending. This separates exposure through school peers from exposure within the student's own family, and it means that linked peers themselves are not part of the estimation sample. The estimation sample contains 334,398 male students.

The two main outcomes are an indicator for appearing in the Gang Register at any point between 2019 and 2024, and gang-related offending between ages 16 and 21, using the definition above. The age window starts when students typically leave compulsory school and ends at the age at which offenders historically became subject to full adult sanctions.

Table 1 compares four groups of male students in grade 7: all (column 1), the estimation sample of students whose father and older brothers have no prior gang-related offending

Table 1: Summary Statistics for Male Students in Grade 7

	(1) All Students	(2) without Gang-Related Family	(3) with Gang-Related Family	(4) with Gang-Listed Family
A. Outcomes: Post or End of Compulsory School				
Crime Activity (Age 16-21)				
Any	0.19	0.18	0.43	0.62
Gang-Related	0.04	0.04	0.15	0.31
Violent	0.06	0.05	0.19	0.35
Property	0.07	0.06	0.21	0.33
Narcotics	0.08	0.07	0.24	0.43
Weapon	0.02	0.02	0.09	0.17
Other	0.07	0.07	0.13	0.18
Listed in the Gang Register	0.02	0.01	0.07	0.36
Eligiblity to High School	0.88	0.89	0.71	0.62
Merit Score	212.66	214.49	163.86	152.72
Standardized Test (Grade 9)	-0.06	-0.04	-0.58	-0.83
Mental Health Diagnose (Age 13-15)				
Mood	0.02	0.02	0.04	0.01
Stress	0.03	0.03	0.05	0.02
B. Background				
Foreign Background	0.20	0.19	0.30	0.75
Single Parent Home	0.25	0.24	0.47	0.41
Standardized Test (Grade 6)	-0.08	-0.06	-0.54	-0.80
Father Characteristics				
Age	45.03	44.96	46.76	45.31
Above Median Labor Income	0.51	0.52	0.20	0.17
Employed, yr t-1	0.84	0.85	0.58	0.48
Yrs. of Schooling	11.87	11.94	10.02	9.38
Dead	0.01	0.01	0.04	0.02
Missing	0.03	0.03	0.01	0.05
Mother Characteristics				
Age	43.08	43.08	43.15	42.11
Above Median Labor Income	0.50	0.51	0.28	0.19
Employed, yr t-1	0.83	0.84	0.66	0.49
Yrs. of Schooling	12.75	12.82	10.92	9.56
Dead	0.00	0.00	0.01	0.01
Missing	0.01	0.01	0.00	0.01
C. Peer Groups				
Peers in school-grade	95.11	95.28	90.59	90.04
Peers in neighborhood-grade	49.38	49.39	49.03	54.52
Peers in neighborhood-school-grade	22.83	22.91	20.76	20.74
Observations	347,044	334,398	12,646	3,010

Note.—Means for four groups of male students who entered grade 7 in 2013–2019: (1) all male students; (2) the estimation sample, whose father and older brothers have no prior gang-related offending; (3) students whose father or an older brother has prior gang-related offending; and (4) students with at least one father or brother later listed in the Gang Register. Relatives' prior offending covers offenses from the year the student turns seven through the year before he enters grade 7. Crime outcomes are measured between ages 16 and 21, Gang Register listing between 2019 and 2024, school outcomes at the end of compulsory school, and mental-health diagnoses between ages 13 and 15. Peer groups count the other students in the same grade at the student's school, in his neighborhood, and in both. Relatives' Gang Register listing defines column (4) only and is not used to define exposure. Appendix Table A4 reports the same statistics for female students.

(column 2), those whose father or an older brother has such offending (column 3), and those with at least one father or brother who is later listed in the Gang Register (column 4). How different are students who grow up with such a family connection? Comparing columns (2) and (3), the differences are large on every margin. Between ages 16 and 21, 43% of the students in column (3) have at least one recorded offense and 15% have gang-related offending, compared with 18% and 4% in the estimation sample, and they are about five times as likely to be listed in the Gang Register (7% versus 1.4%). The same students are about twice as likely to live with a single parent (47% versus 24%), score about half a standard deviation lower on grade-6 standardized tests, and have fathers who are much less likely to earn above the median (20% versus 52%) or to be employed (58% versus 85%). Most of these gaps widen further in column (4): 36% of students with a father or brother who is later listed are listed themselves, and 75% have a foreign background, compared with 19% in the estimation sample.

3 Empirical Design and Identification

This section describes the cohort-to-cohort design and the assumptions under which it identifies the effect of exposure. I then examine the evidence on these assumptions and discuss what the estimated effect represents.

3.1 The Cohort-to-Cohort Comparison

The object of interest is the effect of entering a grade-7 school cohort with more linked peers on a student's subsequent probability of being identified as a participant in a criminal network. Let i index students, s schools, n neighborhoods, and t the calendar year of entry into grade 7. A regression of the outcome on exposure alone,

$$Y_{i,s,n,t+k} = \alpha + \beta^{\text{pop}} \times \text{Brother-Link Exposure}_{i,s,t} + \epsilon_{i,s,n,t}, \tag{2}$$

would not recover this effect. Three challenges complicate the identification of peer effects in schools and neighborhoods: selection, reflection, and common shocks. Families sort across schools and neighborhoods in ways that are correlated with both peer composition and later outcomes; students and their peers may influence each other's behavior; and shocks that hit a cohort can move its composition and its outcomes together.

Reflection is a central concern in the peer-effects literature (Manski 1993; Moffitt 2001), but it plays a smaller role here. Exposure is defined by the past offending of peers' older brothers rather than by the contemporaneous behavior of the peers themselves. Because this offending is recorded before the cohort forms, the students' behavior in the cohort cannot have affected it. The design assumes that influence runs from older to younger individuals,

in line with evidence on sibling influence (Altonji et al. 2017) and on sibling correlations in crime (Eriksson et al. 2016).

To address selection and shocks common to a cohort, I estimate

$$Y_{i,s,n,t+k} = \beta \times \text{Brother-Link Exposure}_{i,s,t} + \phi_t + \lambda_{s,n} + \varepsilon_{i,s,n,t}, \tag{3}$$

where ϕ_t are calendar-year fixed effects and $\lambda_{s,n}$ are school–neighborhood fixed effects. The calendar-year fixed effects absorb shocks common to all students entering grade 7 in the same year. The school–neighborhood fixed effects restrict comparisons to students who attend the same school *and* live in the same neighborhood, so the estimates rely on differences between cohorts drawn from the same school and the same residential area (Hoxby 2000).

I condition on the combination of school and neighborhood, rather than on schools alone, because a school draws its students from several neighborhoods, and the mix of neighborhoods in its intake can change from one year to the next. A comparison within schools would then partly compare students from different residential environments, and gang activity in Sweden is geographically concentrated (Appendix Figure A5). Holding the school and the neighborhood fixed removes persistent differences in both environments, including the local presence of criminal networks, and leaves the variation that arises from which students happen to enter that school from the same area in a given year. The same fixed effects can also be kept when exposure is instead measured among same-age neighborhood peers, so the school- and neighborhood-based estimates differ only in the peer group and not in the comparison.

The design thus relies on variation in cohort composition across entry years. Birth date determines the year in which a student enters grade 7, while the number of linked peers he meets depends on which other students enter the same school in that year. Figure 3 shows this variation. Among cohorts with at least one linked peer, linked peers make up mainly 1% to 5% of the cohort, or one to five students in an average school cohort of about 95, with a right tail to roughly 10%. Absorbing the fixed effects compresses the distribution but leaves substantial variation, and it is this remaining variation that (3) uses. Because exposure is a share, the coefficients correspond to moving from no linked peers to a cohort made up entirely of them, far outside the observed range. I therefore report effects of a 5 percentage point increase in exposure, following Billings and Hoekstra (2023). In an average school cohort, this corresponds to roughly five additional linked peers. I also report the effect of one additional linked peer, from a specification that measures exposure as the number of linked peers and controls for cohort size.

Following Angrist (2014) and related applied work (Billings and Hoekstra 2023; Kim and Fletcher 2017; Larsen and Kristensen 2017), the estimation sample excludes students whose own father or older brother has prior gang-related offending, so that a student's own family background is not mechanically tied to his exposure. Standard errors are two-way clustered by school and neighborhood. Under the identifying assumptions discussed below,

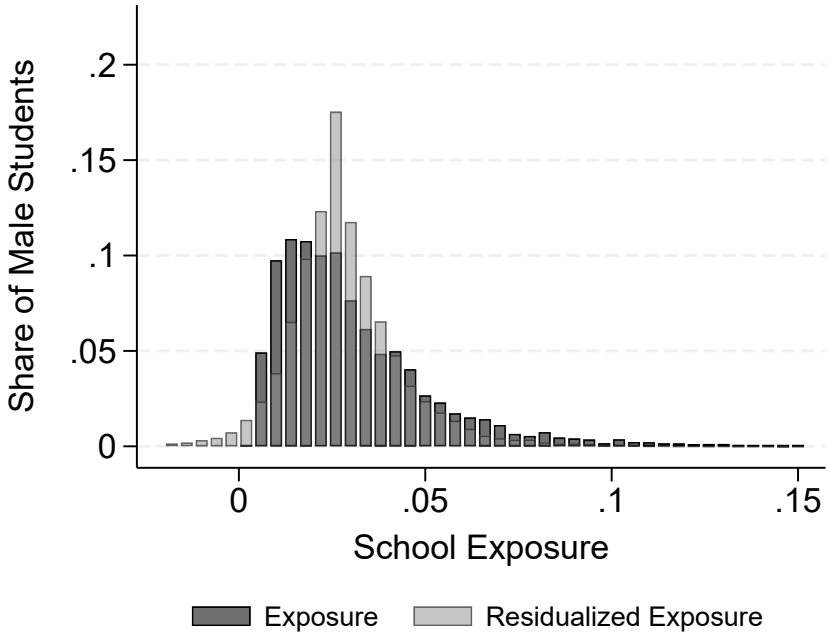


Figure 3: Distribution of Brother-Link Exposure, Raw and Net of Fixed Effects

Note.—Distribution of Brother-Link Exposure among male students in grade 7. Brother-Link Exposure is the share of linked peers, students with an older brother who had gang-related offending before entering grade 7, among the other students in grade 7 at the same school in the same year. Dark bars show exposure as measured, and light bars the residuals from a regression of exposure on calendar-year and school–neighborhood fixed effects, re-centered at the raw mean; these residuals are the variation that (3) uses. Students with zero exposure are excluded, and the horizontal axis is truncated at 0.15. Appendix Table A3 reports the corresponding statistics for exposure through older brothers and fathers in school and neighborhood cohorts.

(3) requires no further controls, but adding them can improve precision and function as additional robustness checks. I add, in turn, (i) the student's own predetermined characteristics (foreign background, single-parent household, and parental income, employment, and education), (ii) the composition of the cohort (the shares of students who are male and who have a foreign background), (iii) municipality-specific linear trends, and (iv) cohort size.

3.2 Assessing the Identifying Assumptions

Identification rests on three assumptions: (i) school selection, (ii) cohort-specific shocks, and (iii) endogenous mobility. Together, they imply that, conditional on calendar-year and school–neighborhood fixed effects, the remaining cohort-to-cohort variation in exposure is unrelated to other determinants of students' later outcomes. Put simply, students who enter a school in a year with more linked peers should be comparable to students who enter the same school, from the same neighborhood, in other years. Because some determinants of outcomes are unobserved, I assess each assumption through one of its testable implications.

Table 2: Brother-Link Exposure and Students' Predetermined Characteristics

	Dep. Var.: Older-Brother-Link Exposure in School Grade	
	(1)	(2)
Foreign Background	0.01009**	0.00014
	(0.00097)	(0.00013)
Single Parent HH.	0.00165**	0.00009
	(0.00019)	(0.00008)
Father Age	-0.00000	0.00001
	(0.00001)	(0.00001)
Father Inc. (Below Median)	0.00259**	0.00001
	(0.00017)	(0.00008)
Father Employed	-0.00032	0.00004
	(0.00032)	(0.00013)
Father Comp. School	0.00298**	0.00028*
	(0.00027)	(0.00012)
Father High School	0.00169**	0.00009
	(0.00018)	(0.00008)
Father Missing	0.00070	0.00026
	(0.00082)	(0.00045)
Mother Age	-0.00009**	0.00001
	(0.00002)	(0.00001)
Mother Inc. (Below Median)	0.00181**	-0.00004
	(0.00016)	(0.00008)
Mother Employed	-0.00139**	-0.00001
	(0.00031)	(0.00012)
Mother Comp. School	0.00421**	0.00024
	(0.00048)	(0.00015)
Mother High School	0.00169**	0.00000
	(0.00015)	(0.00007)
Mother Missing	0.00101	-0.00031
	(0.00129)	(0.00070)
Calendar-Year Fixed		✓
School-Neighborhood Fixed		✓
F-Stat	27.99452	1.31349
p(F)	0.00000	0.18490
Adj. R^2	0.06257	0.52136
Dependent Mean	0.02490	0.02490
Observations	334,398	334,398

Note.—Each column regresses Brother-Link Exposure on the student's predetermined characteristics, for male students whose father and older brothers have no prior gang-related offending. Exposure is the share of linked peers, students with an older brother who had gang-related offending before entering grade 7, among the other students in grade 7 at the same school in the same year. Column (2) adds calendar-year and school–neighborhood fixed effects. Income and schooling indicators refer to below-median income and to compulsory or upper-secondary schooling as the highest level. The F-test also includes an unreported indicator for missing household information. Standard errors, two-way clustered by school and neighborhood, in parentheses. (**) $p < .01$, (*) $p < .05$, ($^+$) $p < .1$.

School selection. The first assumption is that, within school–neighborhood cells, families do not select schools on characteristics correlated with the composition of the entering cohort. If they did, exposure would be related to students' own backgrounds. Table 2 regresses exposure on foreign background, household structure, and parental age, income, employment, and education. Without fixed effects, in column (1), exposure is higher for students with a foreign background, a single parent, and parents with less education or lower earnings, and the characteristics are jointly significant at the 1% level ($F = 28.0$). This is the pattern that sorting across schools and neighborhoods would produce. Once calendar-year and school–neighborhood fixed effects are included in column (2), the coefficients shrink toward zero and are jointly insignificant ($F = 1.31$, $p = 0.18$). Only one of the fourteen coefficients remains significant at the 5% level, and it is small: having a father with only compulsory schooling is associated with 0.0003 higher exposure, compared with a mean of 0.025. The same exercise gives similar results for neighborhood-based exposure, with a joint p-value of 0.67 once the fixed effects are included, and for school- and neighborhood-based exposure defined through fathers, with joint p-values of 0.77 and 0.16 (Appendix Table A5 and Table A6).

Cohort-specific shocks. The second assumption is that localized shocks do not move cohort composition and outcomes together. Calendar-year fixed effects absorb shocks common to all cohorts entering grade 7 in the same year, but shocks that vary over time within a school—a change in staff, a temporary program, or a change in local policing—are not absorbed. If cohort composition instead reflects which students happen to enter a school in a given year, its variation across cohorts should resemble what random cohort formation would produce. To assess this, I implement a reshuffling exercise following Ammermueller and Pischke (2009), Carrell and West (2010), and Billings and Hoekstra (2023). The procedure has three steps. (i) For each observed cohort, I draw 4,999 simulated cohorts of the same size from all students observed in grade 7 at the same school over the sample period. (ii) For each simulated cohort, I compute the share of linked peers. (iii) I calculate an empirical p-value equal to the share of simulated cohorts with lower exposure than the observed cohort. If cohorts are formed as if at random, an observed cohort is equally likely to fall anywhere in the distribution of its simulated cohorts, so these p-values should be uniformly distributed within each school. Of the 2,159 schools, 1,740 are informative for this exercise.[9] Pearson, Kolmogorov–Smirnov, and binned χ^2 tests reject uniformity at the 5% level in 4.9%, 3.2%, and 1.3% of these schools, that is, at or below the rate expected by chance (Appendix Table A7). Repeating the exercise within the 2,967 informative neighborhoods, out of 3,361, gives rejection rates of 4.9%, 2.7%, and 2.1%.

[9]Schools observed with only one cohort (262) or without a linked peer in any cohort (157) are not informative. The corresponding numbers for neighborhoods are 6 and 388.

Endogenous mobility. The third assumption is that families do not respond to cohort composition by moving, which would select students into or out of exposure. In the Swedish context, Sjögren et al. (2024) find that inflows of recently arrived migrant students can induce incumbent families to switch schools. Such responses could bias the estimates in either direction. If the students most adversely affected by exposure leave high-exposure cohorts, the estimates would understate its effects; if students already at higher risk are more likely to remain, they would overstate them. Appendix Table A8 therefore relates exposure in grade 6 to school and residential moves between grades 6 and 7. If families moved away from cohorts with many linked peers, students with higher exposure in grade 6 would be more likely to change schools or neighborhoods before grade 7. Grade-6 exposure does not predict changing schools (a coefficient of 0.030 with a standard error of 0.041, against a mean of 58%) or changing neighborhoods (0.000, with a standard error of 0.020, against a mean of 5%). The same holds among students whose school also offered grade 7, although this estimate is less precise (0.015, with a standard error of 0.110, against a mean of 14%).

Together, these exercises show the patterns one would expect if the identifying assumptions hold. Within school–neighborhood cells, exposure is unrelated to students' observed backgrounds, its variation across cohorts produces no more rejections of random cohort formation than chance would, and it does not predict moves before grade 7. I therefore proceed to the results under these assumptions.

3.3 What the Estimate Represents

Under the identifying assumptions, β measures the effect of entering a school cohort with a higher share of linked peers. It is an intention-to-treat effect: it captures the consequences of sharing a cohort with more linked peers, whether or not a student gets to know any particular one of them. It applies to male students without a gang-related father or older brother of their own, who make up the estimation sample.

Because friendships within cohorts are not observed, the specification treats all linked peers in a cohort alike. Each contributes equally to measured exposure, and each additional percentage point of exposure has the same effect, a restriction I relax in a robustness check. This linear-in-means specification is the workhorse in empirical work on peer effects, although more general models allow peers to matter in other ways than through their average behavior (Boucher et al. 2024). Students are also likely to interact more with some peers than with others, for example with peers of a similar background. The cohort share may therefore differ from the exposure a student actually experiences, which I examine by distinguishing linked peers by their social proximity to the student.

Finally, exposure may be correlated with other features of the cohort, such as its sex composition or the socioeconomic background of its students. I therefore also estimate the model with these characteristics in place of Brother-Link Exposure.

4 The Overall Effect of Exposure

This section estimates the overall effect of exposure to linked peers on Gang Register listing and gang-related offending, an effect that may combine behavioral influence and network access. I first present the main estimates. I then examine whether they could reflect other characteristics of the cohort, exposure in older cohorts, or particular parts of the sample, and finally trace how the effect on offending evolves with age.

Table 3: Effect of Brother-Link Exposure on Gang Register Listing and Gang-Related Offending

	Listed in the Gang Register					Gang-Related Offense (Ages 16–21)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Brother-Link Exposure	0.0534**	0.0507**	0.0503**	0.0488**	0.0484*	0.0734**	0.0694**	0.0674*	0.0681*	0.0678*
	(0.0185)	(0.0184)	(0.0184)	(0.0188)	(0.0188)	(0.0271)	(0.0268)	(0.0269)	(0.0270)	(0.0271)
Focal Controls		✓	✓	✓	✓		✓	✓	✓	✓
Peer Group Controls			✓	✓	✓			✓	✓	✓
Linear Municipality Trends				✓	✓				✓	✓
School Grade Size					✓					✓
5 pp. Effect (% Mean)	19.0%	18.0%	17.9%	17.4%	17.2%	10.5%	9.9%	9.6%	9.7%	9.7%
Dep. Mean	0.0140	0.0140	0.0140	0.0140	0.0140	0.0350	0.0350	0.0350	0.0350	0.0350
Observations	334,398	334,398	334,398	334,398	334,398	334,398	334,398	334,398	334,398	334,398

Note.—Each column reports the coefficient on Brother-Link Exposure from a separate estimate of (3), for male students who entered grade 7 in 2013–2019 and whose father and older brothers have no prior gang-related offending. Brother-Link Exposure is the share of linked peers, students with an older brother who had gang-related offending before entering grade 7, among the other students in grade 7 at the same school in the same year. Columns (1)–(5) report effects on being listed in the Gang Register between 2019 and 2024, and columns (6)–(10) on gang-related offending between ages 16 and 21, which requires a first recorded offense by age 21 and either a gang-common offense (murder, weapons possession, aggravated narcotics offenses, robbery, coercion, or extortion) or at least two co-offenses in assault, property, or non-aggravated narcotics offenses. Columns (1) and (6) include calendar-year and school–neighborhood fixed effects only. Columns (2) and (7) add the student's predetermined characteristics: foreign background, single-parent household, indicators for maternal and paternal income above the median and for November employment, indicators for the highest parental education at the compulsory or upper-secondary level, with longer education omitted, and indicators for missing information. Columns (3) and (8) add peer-group composition, the cohort shares of male students and of students with a foreign background. Columns (4) and (9) add municipality-specific linear trends, and columns (5) and (10) cohort size. *5 pp. Effect (% Mean)* is the effect of a 5 percentage point increase in exposure, about five additional linked peers in an average cohort, relative to the mean of the outcome. Standard errors, two-way clustered by school and neighborhood, in parentheses. $(^{**})$ $p < .01$, $(^{*})$ $p < .05$, $(^{+})$ $p < .1$.

Main estimates. Table 3 reports estimates of (3). Column (1) presents the baseline specification, with calendar-year and school–neighborhood fixed effects only. A 5 percentage point increase in exposure raises the probability of later appearing in the Gang Register by 0.27 percentage points, a 19.0% increase relative to the mean of 1.4%. Adding the four sets of controls in turn, in columns (2) to (5), lowers the estimate slightly, to 0.24 percentage points or 17.2% of the mean. The estimates for gang-related offending between ages 16 and 21 follow the same pattern: 0.37 percentage points, or 10.5% of the mean of 3.5%, in column (6), and 0.34 percentage points, or 9.7%, with all controls in column (10). Because gang-related offending depends less on police discretion than listing, the similar pattern for this outcome suggests that the results do not merely reflect which students the police identify. All estimates are statistically significant at the 5% level. Including the controls changes the estimates little, and the results are robust across specifications.

Measuring exposure as the number of linked peers rather than their share leads to the same conclusion (Appendix Table A9). With cohort size controlled for throughout, one additional linked peer raises the probability of listing by 0.05 percentage points, or 3.6% of the mean, and the probability of gang-related offending by 0.07 percentage points, or 2.0% (columns 1 and 5). With all controls, the corresponding effects are 3.3% and 2.1% of the mean, about a fifth of the 5 percentage point effects in Table 3. Aggregated over all students in the sample, exposure at its observed level accounts for about 10% of those who appear in the Gang Register.[10]

Other cohort characteristics. If exposure proxied for other features of the cohort, the estimates would reflect the composition of the cohort rather than the older-brother links. In Figure 4, I therefore replace Brother-Link Exposure in (3), one at a time, with the cohort share of peers who are male, who have a foreign background, or whose fathers or mothers have below-median income, are employed, or have compulsory or upper-secondary schooling as their highest education. None of these characteristics reproduces the effect of Brother-Link Exposure. All estimates lie within about 0.01 of zero for listing and 0.02 for gang-related offending, compared with 0.053 and 0.073 for Brother-Link Exposure.

Older cohorts. A student also shares his school with the two cohorts above him. I measure exposure in his own cohort because students spend most of their time with peers in their own grade, through classes and other structured activities. Exposure in older cohorts may also be more visible to families and therefore more susceptible to school selection and endogenous mobility. Appendix Table A10 reports estimates with exposure measured separately in the student's own cohort and in the cohorts one and two years above him

[10]The calculation multiplies the baseline estimate for listing (0.0534, column 1 of Table 3) by mean exposure in the estimation sample (0.0249) and the number of students in it: $0.0534 \times 0.0249 \times 334{,}398 \approx 445$, with a 95% confidence interval of about 140 to 750. With a listing rate of 1.4%, the sample contains about 4,680 listed students, so the 445 listings correspond to about 9.5% of them. The calculation assumes that the effect is linear in exposure.

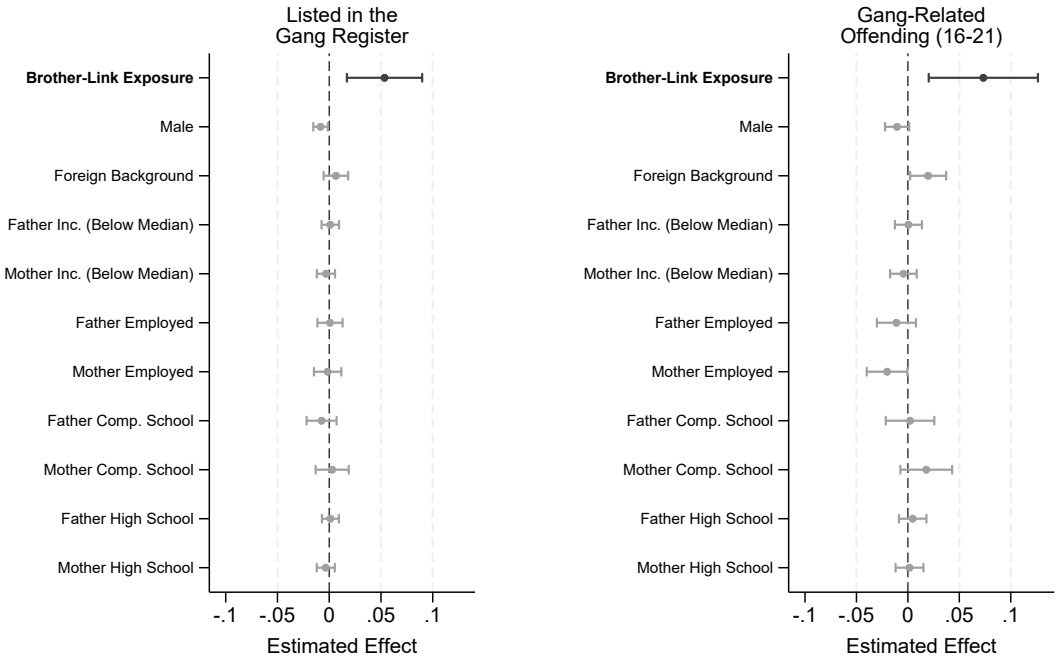


Figure 4: Effects of Brother-Link Exposure and of Other Cohort Characteristics

Note.—Each row reports the coefficient from a separate estimate of (3), with calendar-year and school–neighborhood fixed effects, for male students who entered grade 7 in 2013–2019 and whose father and older brothers have no prior gang-related offending. The first row reports Brother-Link Exposure, the share of linked peers (students with an older brother who had gang-related offending before entering grade 7) among the other students in grade 7 at the same school in the same year, as in columns (1) and (6) of Table 3. In the other rows, exposure is replaced, one at a time, by the cohort share of students who are male, who have a foreign background, or whose father or mother has below-median income, is employed, or has compulsory or upper-secondary schooling as the highest level. The left panel reports effects on Gang Register listing and the right panel on gang-related offending between ages 16 and 21. Bars show 95% confidence intervals based on standard errors two-way clustered by school and neighborhood.

in the same school. For listing, the estimates are 0.051 for the own cohort against 0.020 and 0.021 for the older cohorts; for gang-related offending, they are 0.075 against 0.026 and 0.003. Only the own-cohort estimates are statistically distinguishable from zero. When I pool exposure over all three cohorts, the overall effect is larger (0.104 for listing and 0.123 for gang-related offending), but the separate estimates suggest that peers in the student's own cohort primarily drive it.

Additional robustness. The estimates do not depend on particular parts of the sample. Appendix Figure A6 reports estimates of (3) after excluding schools in which no cohort has a linked peer, the 1% or 5% smallest or largest cohorts, one entry year at a time, and Stockholm, Gothenburg, or Malmö in turn. For school exposure, the estimates range from 0.042 to 0.064 for Gang Register listing and from 0.053 to 0.099 for gang-related offending, against 0.053 and 0.073 in the baseline. The largest estimates for both outcomes, which also have the widest confidence intervals, come from excluding schools without a linked peer in any cohort. When I relax the linear specification by adding a quadratic term in

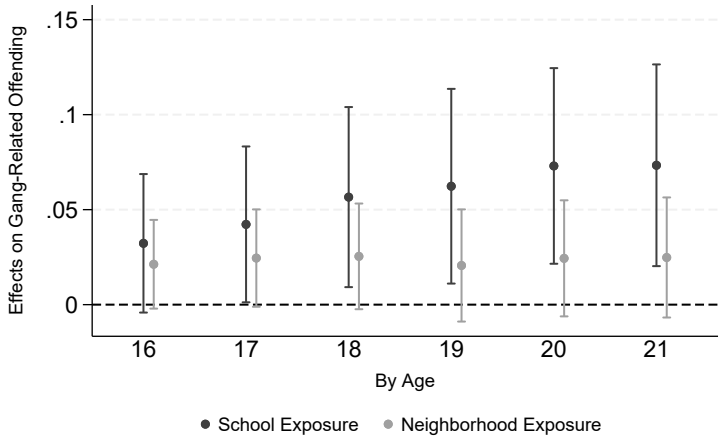


Figure 5: Effect on Gang-Related Offending Recorded by Each Age from 16 to 21

Note.—Each point reports the coefficient on exposure from a separate estimate of (3), with calendar-year and school–neighborhood fixed effects, for male students who entered grade 7 in 2013–2019 and whose father and older brothers have no prior gang-related offending. The outcome is gang-related offending recorded by the age on the horizontal axis. Dark points use Brother-Link Exposure, the share of linked peers (students with an older brother who had gang-related offending before entering grade 7) among the other students in grade 7 at the same school in the same year, and light points the corresponding share among same-age peers in the student's neighborhood. Because the criminal registers end in 2023, later birth cohorts are observed only up to younger ages, so the sample changes along the horizontal axis. Bars show 95% confidence intervals based on standard errors two-way clustered by school and neighborhood.

exposure, the effect on gang-related offending appears only once exposure reaches about 5% (Appendix Figure A7).

Age profile. Figure 5 reports estimates of (3) for gang-related offending recorded by each age from 16 to 21. For school exposure, the estimate is 0.032 at age 16, where its confidence interval includes zero, and rises to 0.073 by age 20. The timing is consistent with connections formed in early adolescence that translate into recorded offending over the following years, in line with the age structure of recruitment described earlier.

5 Strong Links: Behavioral Influence or Network Access?

Entering a school cohort with more linked peers raises a student's later probability of appearing in the Gang Register and of gang-related offending. Two channels could produce this effect. The first is behavioral influence: a linked peer affects other students through his or her own behavior, and the older brother's record reflects family circumstances associated with that behavior. The second is network access: the linked peer connects other students to someone outside the cohort, namely the older brother and the network around him. In this case, a weak tie formed in school leads to a strong link outside it: the linked peer's older brother. Both channels can raise offending, and both may operate at the same time.

The two channels differ in whether the effect requires contact with people outside the cohort. I therefore distinguish two groups of outcomes. General offending, measured by any offense between ages 16 and 21 and by co-offending with a linked peer, can respond to behavioral influence without such contact. Network outcomes, measured by Gang Register listing and by co-offending with a linked peer's older brother or with another individual listed in the Gang Register, more directly capture participation in the network or contact with it. Gang-related offending lies between the two groups, since it measures behavior characteristic of network environments without measuring membership. Either channel can raise outcomes in both groups. Network access, however, predicts that the effects on network outcomes depend on whether the older brother can be reached. Behavioral influence does not, unless the linked peer's own behavior depends on the brother's availability.

This section follows these strong links. I first examine exposed students' later co-offending partners, then whether the effect depends on the older brother's gang-related offending rather than on criminal family backgrounds in general, and finally whether the effects on network outcomes require the older brother to be reachable.

5.1 Later Co-Offending Partners

Case-level records identify co-offenders, which makes it possible to observe exposed students' later co-offending partners. If exposure operated only through behavioral influence, exposed students should become more likely to co-offend with the linked peers themselves. Network access implies a broader pattern: exposure should also increase co-offending with the linked peers' older brothers and with individuals listed in the Gang Register.

Table 4 reports the estimates for co-offending after compulsory school. A 5 percentage point increase in exposure raises the probability of co-offending with a linked peer by about 46% of the mean, with a linked peer's older brother by about 22%, and with an individual listed in the Gang Register by about 12%. The increase in co-offending thus extends beyond the linked peers. The last two outcomes directly reveal contact with the network: exposed students later commit offenses together with the older brothers of their school peers and with individuals the police identify as network participants.

The remaining columns ask whether these new relationships replace or add to the relationship with the linked peer. When co-offending is split into offending with the linked peer only, with the older brother only, and with both, the estimates are positive for the linked peer only (0.055) and for both (0.046), while the estimate for the older brother only shrinks to 0.010, against 0.056 for co-offending with the brother overall. The corresponding split for register members gives 0.042 for the linked peer only, 0.059 for both, and -0.004 for a register member only. The increase in co-offending with the older brother and with register members occurs mainly among students who also co-offend with the linked peer.

Table 4: Later Co-Offending with Linked Peers, Their Older Brothers, and Register Members

	Post-Compulsory School Co-Offense with:								
	(1) Linked Peer	(2) Older Brother	(3) Registered Gang-Member	(4) Linked Peer Not Brother	(5) Brother Not Linked Peer	(6) Linked Peer & Brother	(7) Linked Peer Not Gang	(8) Gang Not Linked Peer	(9) Linked Peer & Gang
Brother-Link Exposure	0.101**	0.056**	0.055*	0.055**	0.010	0.046**	0.042**	-0.004	0.059**
	(0.020)	(0.021)	(0.028)	(0.013)	(0.013)	(0.014)	(0.010)	(0.019)	(0.019)
Dep. Mean	0.011	0.013	0.023	0.006	0.008	0.006	0.004	0.015	0.007
Observations	334,398	334,398	334,398	334,398	334,398	334,398	334,398	334,398	334,398

Note.—Each column reports the coefficient on Brother-Link Exposure from a separate estimate of (3), with calendar-year and school–neighborhood fixed effects, for male students who entered grade 7 in 2013–2019 and whose father and older brothers have no prior gang-related offending. Brother-Link Exposure is the share of linked peers, students with an older brother who had gang-related offending before entering grade 7, among the other students in grade 7 at the same school in the same year. The outcomes indicate whether the student, after compulsory school, commits an offense together with (1) a linked peer, (2) a linked peer's older brother, or (3) an individual listed in the Gang Register; co-offenders are individuals recorded in the same criminal case. Columns (4)–(6) split the outcomes in columns (1) and (2) into co-offending with a linked peer but not the older brother, with the older brother but not a linked peer, and with both. Columns (7)–(9) split the outcomes in columns (1) and (3) in the same way. Standard errors, two-way clustered by school and neighborhood, in parentheses. (**) $p < .01$, (*) $p < .05$, (+) $p < .1$.

The new criminal relationships add to, rather than replace, the relationship with the linked peer, consistent with the linked peer acting as a bridge to his or her older brother and the network around him.

This pattern also speaks against a simpler explanation, in which exposure widens the pool of potential partners independently of the linked peer. Co-offending with older brothers or register members would then also rise when the linked peer is not involved, but these estimates shrink to 0.010 and −0.004.

5.2 Gang-Related versus Other Family Criminality

Under behavioral influence, the older brother's record matters only as a sign of the linked peer's home environment. If so, exposure through older brothers with other criminal records should have similar effects. I therefore split exposure through older brothers with any prior offending into exposure through brothers with gang-related offending and exposure through brothers with other prior offending only, and include both in the same specification. A peer counts toward the first measure if an older brother has gang-related offending and toward the second otherwise.

Panel B of Table 5 reports the results. A 5 percentage point increase in exposure through brothers with gang-related offending raises Gang Register listing by about 19% of the mean, gang-related offending by about 11%, violent offending by 9%, property offending by 5%, and narcotics offending by 8%. Exposure through brothers with other prior offending has smaller effects, at most about 4% of the mean, none of which is statistically distinguishable from zero. These estimates are close to zero for violent and property offending (0.003 and 0.002) and largest, in absolute terms, for narcotics offending (0.029). The effect appears to run through older brothers with gang-related offending rather than through criminal family backgrounds in general.

Brothers with gang-related offending may also differ from other criminally active brothers in other ways, for instance in how serious or frequent their offending is. Panel C holds the type of offending fixed and varies the family member, comparing exposure through older brothers and through fathers with gang-related offending, included jointly. A father with gang-related offending is likely a stronger signal of a criminal home environment, and he may also shape the behavior of both the linked peer and the older brother. If the effect ran through behavioral influence from the home, fathers should matter at least as much as brothers. If access and social proximity matter, brothers should matter more: they are closer in age to the cohort and more likely to belong to the groups that draw in younger adolescents.

The brother estimates are larger for all five outcomes. For listing, a 5 percentage point increase in exposure through brothers raises the probability by about 19% of the mean, against about 6% through fathers, and for violent offending the father estimate is close to zero (0.004, against 0.090 for brothers). As with other criminally active brothers, the

Table 5: Gang-Related versus Other Offending, and Older Brothers versus Fathers

	Dep. Vars.: Listed in the Gang Register or Offense Types at Ages 16–21				
	(1) Listed	(2) Gang-Related	(3) Violent	(4) Property	(5) Narcotics
Panel A. Older Brothers with Any Prior Offending					
Brother-Link Exp.: Any	0.024*	0.046**	0.036*	0.023	0.063**
	(0.011)	(0.015)	(0.017)	(0.019)	(0.019)
Panel B. Older Brothers with Gang-Related versus Other Prior Offending					
Brother-Link Exp.: Gang	0.054**	0.074**	0.091**	0.067*	0.123**
	(0.019)	(0.027)	(0.028)	(0.033)	(0.031)
Brother-Link Exp.: Other	0.010	0.027	0.003	0.002	0.029
	(0.012)	(0.017)	(0.020)	(0.022)	(0.023)
p -value: Gang=Other	0.039	0.137	0.011	0.088	0.012
Panel C. Older Brothers versus Fathers with Gang-Related Offending					
Brother-Link Exp.: Gang	0.053**	0.073**	0.090**	0.067*	0.121**
	(0.018)	(0.027)	(0.028)	(0.033)	(0.031)
Father-Link Exp.: Gang	0.018	0.025	0.004	0.007	0.065
	(0.022)	(0.033)	(0.039)	(0.039)	(0.043)
p -value: Brother=Father	0.200	0.280	0.072	0.247	0.306
Obs.	334,398	334,398	334,398	334,398	334,398
Dep. Mean	0.014	0.035	0.053	0.064	0.073

Note.—Each column reports estimates from a separate regression based on (3), with calendar-year and school–neighborhood fixed effects, for male students whose father and older brothers have no prior gang-related offending. Each exposure measure is the share of the other students in the student's grade-7 school cohort with the indicated family link before entering grade 7. Panel A uses older brothers with any prior offending. Panel B splits this measure in two, included in the same regression: a peer counts toward the first if an older brother has gang-related offending and toward the second otherwise. Panel C includes exposure through older brothers and through fathers with gang-related offending in the same regression. The p-values test the equality of the two coefficients. Standard errors, two-way clustered by school and neighborhood, in parentheses. $(^{**})$ $p < .01$, $(^{*})$ $p < .05$, $(^{+})$ $p < .1$.

largest father estimate in absolute terms is for narcotics offending (0.065). Links that signal a criminal home environment, whether through other criminally active brothers or through a father with gang-related offending, appear to matter mainly for narcotics offending, which may reflect delinquent behavior more broadly, and little for violent offending and network participation. Violent offending and network participation instead follow the link to an older brother with gang-related offending, as network access predicts.

5.3 Availability of the Older Brother

If the effect runs through network access, the effects on network outcomes should be smaller when contact with the older brother is limited. The effects on general offending, which

can arise through behavioral influence alone, should depend less on him. I examine three characteristics that plausibly limit contact: where the older brothers with gang-related offending live, whether they were sentenced to prison, and how much older they are than the linked peer.

Geographic proximity. Table 6 splits exposure by whether none, some, or all of a linked peer's older brothers with gang-related offending lived in another municipality during grade 7, with the three measures included jointly. Residential distance does not directly change the seriousness of these brothers' criminal involvement or the perceived costs of offending, so differences across the groups are unlikely to reflect deterrence. For general offending, the estimates are similar whether or not the brothers live elsewhere: a 5 percentage point increase in exposure raises any offending by about 7% of the mean when none of them lives in another municipality and by about 6% when all do, and co-offending with a linked peer by about 48% and 46%, respectively. For the network outcomes, the estimates are much smaller when all of them live elsewhere. Co-offending with the older brother falls from about 38% of the mean to about 3%, co-offending with a register member from about 21% to about 1%, and listing from about 29% to about 11%. Gang-related offending shows the same decline, from about 19% to about 2%. When only some of these brothers live elsewhere, the estimates are close to zero for the network outcomes but similar to those of the other groups for co-offending with a linked peer. With the brothers living elsewhere, the linked peer's own influence remains, but most of the effect on the network outcomes is gone.

Incarceration. A prison sentence offers a second source of variation in availability. Appendix Table A11 splits exposure by whether all of a linked peer's older brothers with gang-related offending were sentenced to prison at the start of or during grade 7, against none or only some of them. A sentence removes the brother from the linked peer's surroundings, and the punishment may also deter. For general offending, the estimates are similar or larger when all of these brothers were sentenced (0.192 against 0.207 for any offense and 0.175 against 0.099 for co-offending with a linked peer). For the network outcomes, they turn negative (-0.139 against 0.059 for listing, -0.046 against 0.059 for co-offending with the older brother, and -0.016 against 0.057 for co-offending with a register member), as does gang-related offending (-0.128 against 0.079). This pattern is consistent with both disruption and deterrence. Few of these relatively young brothers are sentenced to prison, however, so the estimates for this group are imprecise, with standard errors five to seven times larger than for the other group, and I cannot statistically distinguish them from those for the other linked peers.

Table 6: Effects by Whether the Linked Peers' Older Brothers Live in Another Municipality

	(1) Any Offense (16–21)	(2) Co-Offend with Linked Peer	(3) Gang-Related Offense (16–21)	(4) Listed in the Register	(5) Co-Offend with Brother	(6) Co-Offend with Gang
Brother-Link Exposure, by linked peers' older brothers' municipality of residence during grade 7						
None in another municipality	0.259**	0.105**	0.135**	0.081*	0.100**	0.097*
	(0.063)	(0.029)	(0.041)	(0.032)	(0.031)	(0.042)
Some in another municipality	0.092	0.093*	-0.006	0.015	0.006	0.012
	(0.085)	(0.036)	(0.046)	(0.031)	(0.036)	(0.046)
All in another municipality	0.211*	0.101**	0.017	0.032	0.009	0.005
	(0.093)	(0.032)	(0.045)	(0.028)	(0.034)	(0.038)
p: None = All	0.666	0.919	0.045	0.250	0.038	0.088
Dep. Mean	0.178	0.011	0.035	0.014	0.013	0.023
Observations	334,398	334,398	334,398	334,398	334,398	334,398

Note.—Each column reports estimates from a separate regression based on (3), with calendar-year and school–neighborhood fixed effects, for male students who entered grade 7 in 2013–2019 and whose father and older brothers have no prior gang-related offending. Brother-Link Exposure, the share of linked peers (students with an older brother who had gang-related offending before entering grade 7) among the other students in grade 7 at the same school in the same year, is split into three measures, included in the same regression, by whether none, some, or all of a linked peer's older brothers with gang-related offending lived in another municipality during grade 7. Columns (1) and (2) report general offending: any offense between ages 16 and 21 and co-offending with a linked peer after compulsory school. Columns (4)–(6) report network outcomes: Gang Register listing and co-offending after compulsory school with a linked peer's older brother or with an individual listed in the Gang Register (*Gang*). Column (3) reports gang-related offending between ages 16 and 21. The p-value tests the equality of the coefficients for none and all. Standard errors, two-way clustered by school and neighborhood, in parentheses.
(**) $p < .01$, (*) $p < .05$, (+) $p < .1$.

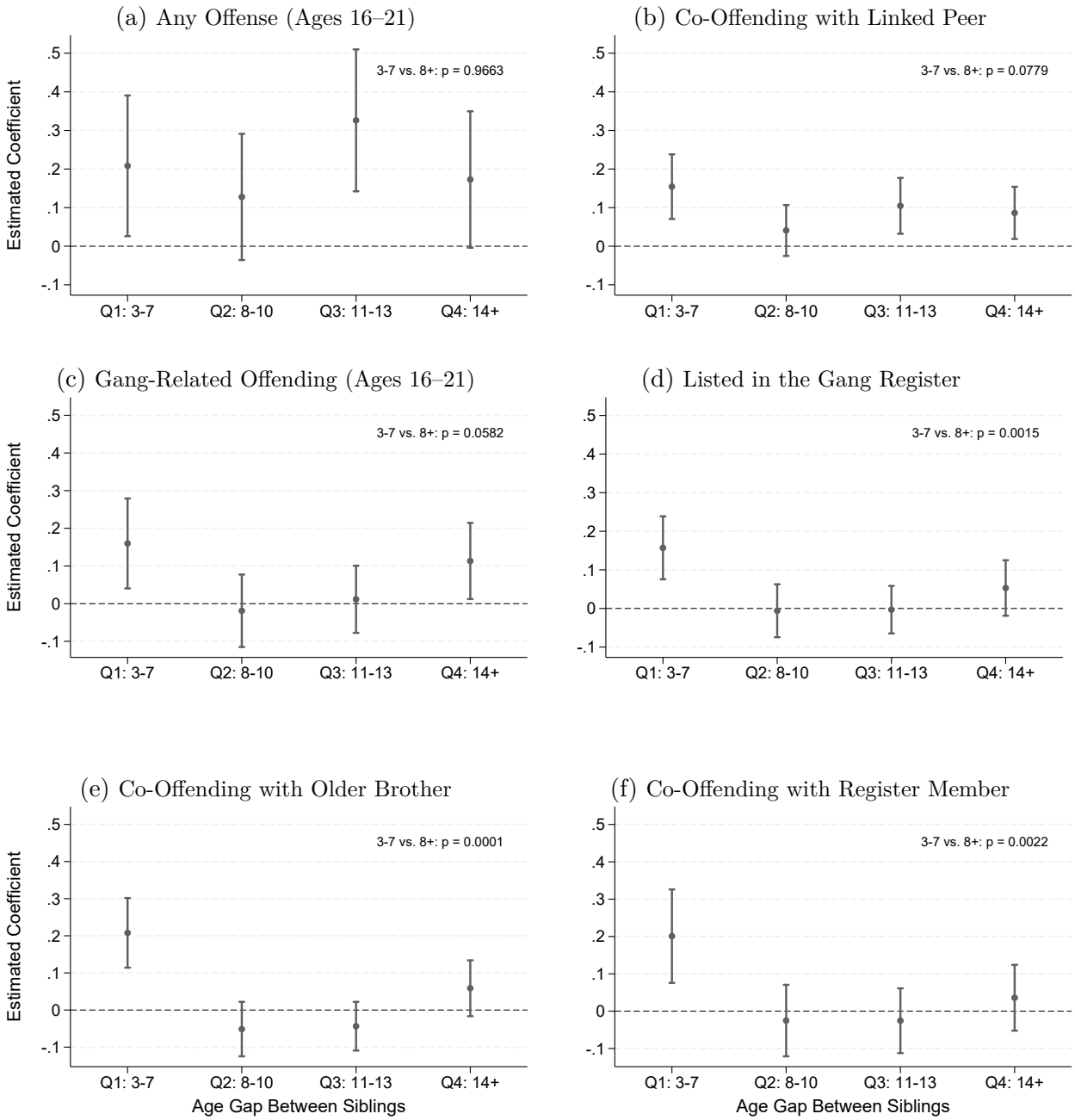


Figure 6: Effects by the Age Gap Between Linked Peers and Their Older Brothers

Note.—Each panel reports estimates from a regression based on (3), with calendar-year and school–neighborhood fixed effects, for male students who entered grade 7 in 2013–2019 and whose father and older brothers have no prior gang-related offending. Brother-Link Exposure, the share of linked peers (students with an older brother who had gang-related offending before entering grade 7) among the other students in grade 7 at the same school in the same year, is split into four measures, included in the same regression, by the quartile of the average age gap between a linked peer and his or her older brothers with gang-related offending (3–7, 8–10, 11–13, and 14 or more years). Because the older brother's qualifying offense must occur before the linked peer enters grade 7, and the brother must then be at least 15, the age of criminal responsibility, the minimum observable gap is three years. Panels (a) and (b) report general offending, panels (d)–(f) network outcomes, and panel (c) gang-related offending; co-offending is measured after compulsory school. The p-value in each panel comes from a separate regression that splits exposure into the lowest quartile and the three upper quartiles combined and tests the equality of the two coefficients. Bars show 95% confidence intervals based on standard errors two-way clustered by school and neighborhood.

Age proximity. A third characteristic is whether the older brothers are close enough in age to interact with a cohort of 13-year-olds. By construction, a brother with gang-related offending is at least three years older than the linked peer. Figure 6 splits exposure by quartiles of the average age gap between a linked peer and his or her older brothers with gang-related offending, with the four measures included jointly. Brothers in the lowest quartile are 3 to 7 years older, or about 16 to 20 years old when the cohort enters grade 7, the ages at which BRÅ describes individuals drawing in younger adolescents. Brothers in the upper quartiles are at least 8 years older and already adults when the cohort forms. For general offending, the estimates are positive across all four quartiles. For the network outcomes, the effect is concentrated in the lowest quartile: exposure through linked peers whose brothers are closest in age raises listing, co-offending with the older brother, and co-offending with a register member, while the estimates are around zero for brothers 8 to 13 years older and smaller for those 14 or more years older. Gang-related offending lies between the two groups.

Although each comparison limits contact with the older brother in a different way, all three point in the same direction. Exposed students offend more, and more often together with the linked peer, whether or not the older brother can be reached. The effects on network outcomes are concentrated among linked peers whose brothers live in the same municipality and are close in age to the cohort, and they turn negative, although imprecisely, when the brothers are in prison.

Together, the results in this section point towards network access. Exposure raises co-offending with the linked peers' older brothers and with register members, it works through brothers with gang-related offending rather than through criminal family backgrounds in general, and its effects on network outcomes depend on whether the brother can be reached. This is the pattern one would expect if the linked peer, a weak tie in school, gives other students access to his or her older brother, a strong link, and through him to the network. Behavioral influence may still contribute, particularly to general offending, which responds to exposure regardless of the brother's availability. If weak ties in school can lead to strong links into criminal networks, it matters which weak ties form, where, and among which students. The next section turns to these questions.

6 Weak Ties: Where and for Whom They Matter

The previous section shows that the effect follows the strong links to the linked peers' older brothers and the networks around them. This section turns to the weak ties that lead there and examines which of them matter, in which settings, and for which students. I first examine whether the effect depends on social proximity to the linked peer and compare exposure in schools with exposure among same-age neighborhood peers. I then examine

Table 7: Effects on Listing by Whether Linked Peers Share the Student's Parental Origin

	Dependent Variable: Listed in the Gang Register		
	(1) Native Parentage	(2) Foreign Parentage	(3) Foreign Parentage (Frequent in the Gang Register)
Panel A. Brother-Link Exposure, Regardless of Parental Origin			
Brother-Link Exposure	0.016	0.154**	0.175**
	(0.010)	(0.056)	(0.066)
Panel B. Brother-Link Exposure By Parental-Origin Match			
Brother-Link Exp. (Different)	0.008	0.044	0.087
	(0.029)	(0.055)	(0.066)
Brother-Link Exp. (Shared)	0.018+	0.525**	0.416**
	(0.010)	(0.116)	(0.129)
p -value: Shared = Different	0.755	0.000	0.010
Observations	269,874	64,524	41,120
Dep. Mean	0.004	0.055	0.064

Note.—Each column reports estimates from a separate regression based on (3), with calendar-year and school–neighborhood fixed effects, in which the outcome is being listed in the Gang Register. The sample consists of male students who entered grade 7 in 2013–2019 and whose father and older brothers have no prior gang-related offending: in column (1) those with at least one Swedish-born parent, in column (2) those with no Swedish-born parent, and in column (3) the students in column (2) whose parental origin is among those most frequently represented in the Gang Register (Appendix Figure A8). Panel A reports the effect of Brother-Link Exposure, the share of linked peers (students with an older brother who had gang-related offending before entering grade 7) among the other students in grade 7 at the same school in the same year. Panel B splits this share into linked peers who share at least one parental region of origin with the student and linked peers who do not, included in the same regression; the p-value tests the equality of the two coefficients. Parental regions of origin are Sweden; other Nordic countries; Western and Central Europe; Eastern Europe and the Caucasus; Central and South Asia; East and Southeast Asia; the Middle East and North Africa; Sub-Saharan Africa; Latin America; North America; and Oceania. Standard errors, two-way clustered by school and neighborhood, in parentheses. (**) $p < .01$, (*) $p < .05$, (+) $p < .1$.

whether the effect is larger where criminal networks are present and among students in at-risk groups, and finally whether exposure affects female students and outcomes beyond crime.

6.1 Social Proximity to the Linked Peer

A weak tie can only lead to a strong link if the student and the linked peer are in contact. Brother-Link Exposure gives every linked peer in the cohort the same weight, but students are likely to interact more with peers of a similar background. Weak ties may then form more readily with some linked peers than with others, so students in the same cohort can differ in how exposed they actually are.

Parental origin provides an observable, if coarse, measure of social proximity in these cohorts, and individuals listed in the Gang Register are disproportionately drawn from a small number of countries of origin (Appendix Figure A8). I therefore split Brother-Link

Exposure into exposure to linked peers who share at least one parental region of origin with the focal student and exposure to those who do not, include both in the same specification, and estimate it separately by the student's own parental background (Table 7).

Among students with no Swedish-born parent, a 5 percentage point increase in exposure raises the probability of listing by about 14% of the mean. Split by origin, the same increase raises listing by about 48% of the mean for origin-matched exposure, against about 4% for exposure to unmatched linked peers. The pattern is similar among students whose parental origin is among those most frequently represented in the register, with about 33% of the mean for matched exposure against about 7% for unmatched exposure. Among students with at least one Swedish-born parent, both estimates are small in absolute terms, reflecting a base rate of 0.4%.

For students with no Swedish-born parent, the weak ties that matter are mainly those to linked peers who share their parental origin. The overall effect thus averages over students who are more or less socially close to the linked peers in their cohort. Shared origin may play a role through friendship formation, overlapping family networks, correlated residential exposure, or shared language.

6.2 School and Same-Age Neighborhood Exposure

Weak ties also form outside school, among same-age peers in the neighborhood, and a large literature documents the importance of neighborhoods for crime, education, and labor-market outcomes.[11] Table 8 re-estimates (3) with the leave-one-out share of same-age neighborhood peers carrying an older-brother link, keeping the same fixed effects. A 5 percentage point increase in this exposure raises listing by about 7% of the mean, against 17% to 19% for the school measure, and gang-related offending by about 4%, against about 10%. When the sample is restricted to neighborhoods in which some cohort has a linked peer, the neighborhood estimates are larger (0.048 for listing and 0.088 for gang-related offending), but so are the school estimates under the same restriction (0.064 and 0.099; Appendix Figure A6). Figure 5 also shows that the neighborhood estimates for gang-related offending remain around 0.02 at every age from 16 to 21, whereas the school estimates rise. Exposure through same-age neighborhood peers thus has smaller effects than exposure in school.

Differences in the age structure of school and neighborhood contact may help explain why. Schools organize repeated contact within grade cohorts, so same-age peers are a regular source of connections to older individuals.

[11] See, among others, Åslund et al. (2011) and Billings and Hoekstra (2023) on education; Oreopoulos (2003), Damm (2014), Chetty et al. (2016), and Chetty and Hendren (2018) on labor-market and mobility outcomes; and Damm and Dustmann (2014), Billings et al. (2019), Billings and Schnepel (2020), Ludwig et al. (2001), and Kling et al. (2005) on crime and delinquency. Kling et al. (2007), Ross (2011), and Chyn and Katz (2021) discuss the broader evidence.

Table 8: Effect of Brother-Link Exposure Among Same-Age Neighborhood Peers

	Listed in the Gang Register					Gang-Related Offense (Ages 16–21)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Brother-Link Exposure	0.0191^{+}	0.0195^{+}	0.0196^{+}	0.0187^{+}	0.0186^{+}	0.0248	0.0261	0.0261	0.0250	0.0249
	(0.0104)	(0.0104)	(0.0104)	(0.0105)	(0.0105)	(0.0161)	(0.0161)	(0.0161)	(0.0160)	(0.0160)
Focal Controls		✓	✓	✓	✓		✓	✓	✓	✓
Peer Group Controls			✓	✓	✓			✓	✓	✓
Linear Municipality Trends				✓	✓				✓	✓
Neighborhood-Cohort Size					✓					✓
5 pp. Effect (% Mean)	6.8%	7.0%	7.0%	6.6%	6.6%	3.5%	3.7%	3.7%	3.6%	3.6%
Dep. Mean	0.0140	0.0140	0.0140	0.0140	0.0140	0.0350	0.0350	0.0350	0.0350	0.0350
Observations	334,398	334,398	334,398	334,398	334,398	334,398	334,398	334,398	334,398	334,398

Note.—Each column reports the coefficient on neighborhood-based Brother-Link Exposure from a separate estimate of (3), for male students who entered grade 7 in 2013–2019 and whose father and older brothers have no prior gang-related offending. Neighborhood-based exposure is the share of linked peers, students with an older brother who had gang-related offending before entering grade 7, among the other students in the same grade who live in the student's neighborhood. Columns (1)–(5) report effects on Gang Register listing and columns (6)–(10) on gang-related offending between ages 16 and 21. Columns (1) and (6) include calendar-year and school–neighborhood fixed effects only; the following columns add, in turn, the student's predetermined characteristics, peer-group composition, municipality-specific linear trends, and neighborhood-cohort size. *5 pp. Effect (% Mean)* is the effect of a 5 percentage point increase in exposure relative to the mean of the outcome. Standard errors, two-way clustered by school and neighborhood, in parentheses. (**) $p < .01$, (*) $p < .05$, ($^{+}$) $p < .1$.

Neighborhood contact is less restricted by age, and students may interact directly with older residents, including a linked neighbor's brother, without a same-age peer in between. As a result, exposure through same-age neighborhood peers may capture a smaller part of the relevant contact than the corresponding school measure.

6.3 Local Network Presence

If exposure operates through network access, the weak ties should matter most where criminal networks are present. Gang activity in Sweden is geographically concentrated (Appendix Figure A5), and Table 9 re-estimates (3) separately for county capitals and other municipalities, for neighborhoods with and without gang presence, and for neighborhoods in the top and bottom quartiles of the foreign-born share. A neighborhood has gang presence if, on average, at least five of its residents were listed in the Gang Register in each year between 2019 and 2023. The estimates are larger where networks are present. For Gang Register listing, the coefficient is 0.139 in neighborhoods with gang presence against 0.012 in those without; for gang-related offending, it is 0.206 against 0.001. The same ordering holds for county capitals against other municipalities (0.083 against 0.030 for listing and 0.139 against 0.019 for gang-related offending) and for the top against the bottom quartile of the foreign-born share (0.125 against 0.005, and 0.186 against -0.001).

Because base rates are also higher where networks are present (5.3% against 0.4% for listing and 7.2% against 2.6% for gang-related offending), the comparison relative to the subsample means differs between the two outcomes. For listing, a 5 percentage point increase in exposure corresponds to about 13% of the mean in neighborhoods with gang presence and about 15% in those without, although the latter estimate is imprecise. For gang-related offending, the corresponding figures are about 14% and close to zero.

Students in neighborhoods with and without gang presence are exposed to linked peers with the same kind of strong link, an older brother with prior gang-related offending. Yet exposure raises gang-related offending only where networks are present, and its effect on listing is larger there in absolute terms. This is the pattern network access predicts: the strong link matters where there is a network for it to lead into.

6.4 Student Risk Factors

The effect of exposure also varies with students' own characteristics. Appendix Table A12 interacts exposure with indicators for being Swedish-native, living in a two-parent household, having grade-6 achievement above the first quartile, and having household income above the first quartile.[12] Each specification also controls for the corresponding indicator, so the coefficient on exposure gives the effect for students in the at-risk group: those with a foreign background, a single parent, or achievement or household income in the bottom quartile.

[12]Prior achievement is measured by standardized test scores from the national tests in grade 6.

Table 9: Effects by Local Network Presence: County Capitals, Gang Presence, and Foreign-Born Share

Panel A. Dependent Variable: Listed in the Gang Register

Sample Restriction:	Main	County Capital	Non-County Capital	Gang Presence	No Gang Presence	Top Quartile Foreign Share	Bottom Quartile Foreign Share
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
B-L Exposure	0.053**	0.083*	0.030+	0.139**	0.012	0.125**	0.005
	(0.019)	(0.036)	(0.016)	(0.054)	(0.009)	(0.047)	(0.011)
Observations	334,398	147,844	186,554	66,880	267,518	78,257	86,519
Dep. Mean	0.014	0.018	0.011	0.053	0.004	0.045	0.002

Panel B. Dependent Variable: Gang-Related Offense (Ages 16–21)

Sample Restriction:	Main	County Capital	Non-County Capital	Gang Presence	No Gang Presence	Top Quartile Foreign Share	Bottom Quartile Foreign Share
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
B-L Exposure	0.073**	0.139**	0.019	0.206**	0.001	0.186**	-0.001
	(0.027)	(0.047)	(0.029)	(0.061)	(0.023)	(0.058)	(0.037)
Observations	334,398	147,844	186,554	66,880	267,518	78,257	86,519
Dep. Mean	0.035	0.039	0.032	0.072	0.026	0.071	0.019

Note.—Each column reports the coefficient on Brother-Link Exposure (*B-L Exposure*) from a separate estimate of (3), with calendar-year and school–neighborhood fixed effects, for the indicated subsample of male students who entered grade 7 in 2013–2019 and whose father and older brothers have no prior gang-related offending. Brother-Link Exposure is the share of linked peers, students with an older brother who had gang-related offending before entering grade 7, among the other students in grade 7 at the same school in the same year. Panel A reports effects on Gang Register listing and Panel B on gang-related offending between ages 16 and 21; columns (1) and (8) use the full sample. *County capitals* comprise Stockholm (including Södertälje), Göteborg, Malmö, Uppsala, Västerås, Nyköping, Linköping, Jönköping, Växjö, Kalmar, Karlskrona, Sundsvall, Halmstad, Karlstad, Örebro, Falun, Gävle, Östersund, Umeå, and Luleå; Sundsvall, the main city of Västernorrland, replaces the formal capital Härnösand, and Visby on Gotland is excluded. *Gang presence* denotes neighborhoods in which, on average, at least five residents were listed in the Gang Register in each year between 2019 and 2023. The *foreign share* columns compare neighborhoods in the top and bottom quartiles of the share of foreign-born residents. Standard errors, two-way clustered by school and neighborhood, in parentheses. (**) $p < .01$, (*) $p < .05$, (+) $p < .1$.

For these students, a 5 percentage point increase in exposure raises the probability of listing by 0.65 to 1.01 percentage points, against 0.27 in the full sample, and the probability of gang-related offending by 0.81 to 1.27 percentage points, against 0.37.

Every interaction term is negative and offsets most or all of the coefficient, so that for students outside each at-risk group the implied coefficients lie between about −0.03 and 0.03, against 0.053 and 0.073 in the full sample. When the four interactions are included together, those for prior achievement and household structure change little for both outcomes, as does the one for a Swedish-native background for listing, while the one for household income shrinks toward zero. Exposure to linked peers matters for students with disadvantaged backgrounds, in particular those with low prior achievement or a single parent, and has little effect on other students.

Larger effects in these groups could partly reflect longer exposure, if at-risk students are less likely than others to leave exposed cohorts. Appendix Table A13 relates grade-7 exposure to changing schools in grade 8 or 9 for the cohorts entering grade 7 in 2013–2017, whose moves are observed through 2019. Exposure does not predict school changes on average (a coefficient of 0.192, with a standard error of 0.117, against a mean of 15%). Among the four characteristics, only prior achievement makes a difference: after exposure, students above the bottom quartile of grade-6 achievement are more likely to change schools (0.134, with a standard error of 0.065). Part of the larger estimate for low-achieving students may therefore reflect that they remain exposed for longer. The other three characteristics show no such difference in mobility, so longer exposure does not explain the larger effects for students with a foreign background, a single parent, or low household income.

6.5 Female Students and Outcomes Beyond Crime

The outcomes so far concern criminal involvement among male students, since men make up 94% of the individuals listed in the Gang Register. Girls and women in criminal networks have nevertheless received growing attention in Sweden, and they are reported to often take on different tasks from men (Brottsförebyggande rådet 2025a). Exposure may therefore affect female students in ways that the crime outcomes capture only in part. It may also affect outcomes beyond crime, among female students who do not take part in crime as well as among male students. Table 10 reports crime, mental-health, and educational outcomes separately by sex.

The estimated effects on crime are concentrated among male students. Among female students, the estimates are small in absolute terms, but so are their base rates (0.1% for listing and 0.6% for gang-related offending, against 1.4% and 3.4% among male students). Relative to these means, the point estimates correspond to about 20% and 14%, close to those for male students, although they are imprecise.

Table 10: Effects of Brother-Link Exposure on Crime, Mental Health, and Education, by Sex

	Listed in Gang Register or Gang-Related Offending (Ages 16-21)		Mental Health Diagnoses (Ages 13-15)		Grade 9 Education	
	(1) Listed	(2) Gang-Related	(3) Mood	(4) Stress	(5) Grade 9 Std. Test Score	(6) High School Eligibility
Panel A. All Students - 643,790						
Brother-Link Exposure	0.028**	0.041**	0.034*	0.031+	-0.087	-0.046+
	(0.009)	(0.014)	(0.014)	(0.018)	(0.073)	(0.028)
Dep. Mean	0.007	0.020	0.037	0.056	0.044	0.898
Panel B. Male Students - 330,830						
Brother-Link Exposure	0.058**	0.068**	0.001	0.003	-0.167+	-0.039
	(0.018)	(0.026)	(0.014)	(0.019)	(0.086)	(0.036)
Dep. Mean	0.014	0.034	0.021	0.032	-0.045	0.890
Panel C. Female Students - 312,960						
Brother-Link Exposure	0.004	0.017	0.057*	0.054+	-0.010	-0.045
	(0.004)	(0.011)	(0.025)	(0.030)	(0.085)	(0.035)
Dep. Mean	0.001	0.006	0.054	0.082	0.138	0.907

Note.—Each cell reports the coefficient on Brother-Link Exposure, the share of linked peers (students with an older brother who had gang-related offending before entering grade 7) among the other students in grade 7 at the same school in the same year, from a separate estimate of (3). Panel A includes all students, Panel B male students, and Panel C female students whose father and older brothers have no prior gang-related offending and who have non-missing grade-9 test scores and high-school eligibility status. Columns (1) and (2) report Gang Register listing and gang-related offending between ages 16 and 21; columns (3) and (4) mood- and stress-related diagnoses between ages 13 and 15; column (5) the grade-9 test score in Swedish, English, and mathematics, standardized within year; and column (6) high-school eligibility, an indicator for passing grades in these subjects. All regressions include calendar-year and school–neighborhood fixed effects and control for any mood- or stress-related diagnosis before grade 7 and for the grade-6 test score, with an indicator for a missing score. Standard errors, two-way clustered by school and neighborhood, in parentheses. (**) $p < .01$, (*) $p < .05$, (+) $p < .1$.

The mental-health estimates show a different pattern. A 5 percentage point increase in exposure raises mood-related diagnoses between ages 13 and 15 among female students by about 5% of the female mean and stress-related diagnoses by about 3%, while the corresponding estimates for male students are close to zero. Educational effects are small. Grade-9 standardized test scores decline among male students by less than one hundredth of a standard deviation for a 5 percentage point increase, and high-school eligibility shows no clear change for either male or female students.

The mental-health results point to consequences of exposure among female students that are not apparent in the crime outcomes. They appear already while the students are in lower secondary school, before the ages at which gang-related offending is measured.

7 Conclusion

This paper asks whether school peers affect adolescents' entry into criminal networks only through their own behavior or also by connecting them to people outside the peer group. Linking Swedish police records on network participants to population registers, I compare male students who enter grade 7 in the same school and neighborhood in different years. A 5 percentage point increase in the share of peers whose older brothers have gang-related offending raises the probability of later appearing in the Gang Register by about a fifth of the mean, and exposure at its observed level accounts for about a tenth of all listings.

Several patterns point towards network access. Exposure raises co-offending with the linked peers' older brothers and with other individuals in the Gang Register, mainly alongside co-offending with the linked peers themselves. The effect follows older brothers with gang-related offending rather than criminal family backgrounds in general. The effects on network outcomes are also smaller when the brothers live in another municipality, are further apart in age, or, although imprecisely, are in prison, while the effects on general offending vary little with the brothers' circumstances. Although each of these comparisons limits contact with the brothers in a different way, all three point in the same direction. Weak ties alone appear to raise general offending, while entry into criminal networks depends on the strong links to peers' older brothers. These weak ties matter most between socially close students, in schools more than among same-age neighbors, where criminal networks are present, and for students with disadvantaged backgrounds. Among female students, exposure raises mood-related diagnoses already in lower secondary school.

Together, the findings suggest that, alongside the behavioral influence emphasized in research on peer effects, weak ties formed in school can give adolescents access to their peers' strong family links and, through them, to criminal networks. Through such links, older criminal networks can reach younger cohorts. Brothers close in age to the cohort, socially close peers, and local networks can be identified in other settings, so these features indicate where similar pathways are likely to matter, even where effect sizes differ. That

the pathway operates in a country with comprehensive public schooling and an extensive welfare state also suggests that it does not depend on weak public institutions. Friendships within cohorts, and how students come into contact with the older brothers, are not observed directly, so the evidence on network access comes from students' later co-offenders and from how the effects vary with the brothers' records and availability. Data that record such ties would allow future work to trace the pathway more directly.

Although the paper does not evaluate specific interventions, the findings can inform prevention. Because the students studied here have no gang-related father or older brother of their own, and linked peers need not offend themselves, prevention that targets young people through their own family's gang involvement or their peers' behavior may miss part of the risk. Support for families in which older brothers have gang-related offending may also benefit the school peers of their younger children, particularly when the brothers are close in age to the cohort and live nearby. The transition to grade 7, at the ages at which recruitment is reported to begin, may be a natural point for such efforts, and policies that make recruitment harder at these ages can have lasting effects on children's schooling and criminal careers, and on the revenues of the organizations that recruit them (Castro et al. 2025). The concentration of the effects where criminal networks are present and among disadvantaged students points to the value of targeting these schools and neighborhoods. Because entry into criminal networks depends on the strong links behind weak ties formed in school, such efforts can be aimed at those links rather than at the students who form the ties.

References

Acemoglu, Daron, Giuseppe De Feo, and Giacomo Davide De Luca (2019). "Weak States: Causes and Consequences of the Sicilian Mafia". *The Review of Economic Studies*.

Altonji, Joseph G., Sarah Cattan, and Iain Ware (2017). "Identifying Sibling Influence on Teenage Substance Use". *Journal of Human Resources*.

Ammermueller, Andreas and Jörn-Steffen Pischke (2009). "Peer Effects in European Primary Schools: Evidence from the Progress in International Reading Literacy Study". *Journal of Labor Economics*.

Angrist, Joshua D. (2014). "The Perils of Peer Effects". *Labour Economics*.

Angrist, Joshua D. and Kevin Lang (2004). "Does School Integration Generate Peer Effects? Evidence from Boston's Metco Program". *American Economic Review*.

Barone, Guglielmo and Gaia Narciso (2015). "Organized Crime and Business Subsidies: Where Does the Money Go?" *Journal of Urban Economics*.

Bayer, Patrick, Randi Hjalmarsson, and David Pozen (2009). "Building Criminal Capital behind Bars: Peer Effects in Juvenile Corrections". *The Quarterly Journal of Economics*.

Bayer, Patrick, Stephen L. Ross, and Giorgio Topa (2008). "Place of Work and Place of Residence: Informal Hiring Networks and Labor Market Outcomes". *Journal of Political Economy*.

Besemer, Sytske and David P. Farrington (2012). "Intergenerational Transmission of Criminal Behaviour: Conviction Trajectories of Fathers and Their Children". *European Journal of Criminology*.

Bhuller, Manudeep, Gordon B. Dahl, Katrine V. Loken, and Magne Mogstad (2018a). "Intergenerational Effects of Incarceration". *AEA Papers and Proceedings*.

Bhuller, Manudeep, Gordon B. Dahl, Katrine V. Løken, and Magne Mogstad (2018b). *Incarceration Spillovers in Criminal and Family Networks*.

Bifulco, Robert, Jason M. Fletcher, and Stephen L. Ross (2011). "The Effect of Classmate Characteristics on Post-secondary Outcomes: Evidence from the Add Health". *American Economic Journal: Economic Policy*.

Billings, Stephen, David J. Deming, and Stephen L. Ross (2019). "Partners in Crime". *American Economic Journal: Applied Economics*.

Billings, Stephen and Kevin T. Schnepel (2020). "Hanging Out with the Usual Suspects: Neighborhood Peer Effects and Recidivism". *Journal of Human Resources*.

Billings, Stephen B. and Mark Hoekstra (2023). "The Effect of School and Neighborhood Peers on Achievement, Misbehavior, and Adult Crime". *Journal of Labor Economics*.

Björklund, Anders, Per-Anders Edin, Peter Fredriksson, and Alan Krueger (2004). *Education, equality, and efficiency - An analysis of Swedish school reforms during the 1990s*. IFAU - Institute for Evaluation of Labour Market and Education Policy.

Boorman, Scott A. (1975). "A Combinatorial Optimization Model for Transmission of Job Information through Contact Networks". *The Bell Journal of Economics*.

Boucher, Vincent, Michelle Rendall, Philip Ushchev, and Yves Zenou (2024). "Toward a General Theory of Peer Effects". *Econometrica*.

Brottsförebyggande rådet (2016). *Kriminella nätverk och grupperingar: polisers bild av maktstrukturer och marknader*.

— (2021a). *Dödligt skjutvapenvåld i Sverige och andra europeiska länder: en jämförande studie av nivåer, trender och våldsmetoder*.

— (2021b). *Narkotikamarknader*.

— (2023). *Barn och unga i kriminella nätverk*.

— (2024). *Ökningen av skjutvapenvåld i Sverige*.

— (2025a). "Flickor och kvinnor i kriminella nätverk".

— (2025b). "Var inträffar skjutningar och sprängningar?"

Bruhn, Jesse (2021). "Competition in the Black Market: Estimating the Causal Effect of Gangs in Chicago". *SSRN Electronic Journal*.

Böhlmark, Anders, Helena Holmlund, and Mikael Lindahl (2016). "Parental Choice, Neighbourhood Segregation or Cream Skimming? An Analysis of School Segregation after a Generalized Choice Reform". *Journal of Population Economics*.

Calvó-Armengol, Antoni and Matthew O. Jackson (2004). "The Effects of Social Networks on Employment and Inequality". *American Economic Review*.

Calvó-Armengol, Antoni, Thierry Verdier, and Yves Zenou (2007). "Strong and Weak Ties in Employment and Crime". *Journal of Public Economics*.

Campedelli, Gian Maria, Gianmarco Daniele, and Marco Le Moglie (2024). *Mafia, Politics and Machine Predictions*.

Carrell, Scott E., Richard L. Fullerton, and James E. West (2009). "Does Your Cohort Matter? Measuring Peer Effects in College Achievement". *Journal of Labor Economics*.

Carrell, Scott E., Mark Hoekstra, and Elira Kuka (2018). "The Long-Run Effects of Disruptive Peers". *American Economic Review*.

Carrell, Scott E. and Mark L. Hoekstra (2010). "Externalities in the Classroom: How Children Exposed to Domestic Violence Affect Everyone's Kids". *American Economic Journal: Applied Economics*.

Carrell, Scott E. and James E. West (2010). "Does Professor Quality Matter? Evidence from Random Assignment of Students to Professors". *Journal of Political Economy*.

Carvalho, Leandro S. and Rodrigo R. Soares (2016). "Living on the Edge: Youth Entry, Career and Exit in Drug-Selling Gangs". *Journal of Economic Behavior & Organization*.

Castro, Eleno, Felipe Coy, Carlos Schmidt-Padilla, and Maria Micaela Sviatschi (2025). "Breaking the Gang: A Preventive Approach to Reduce Recruitment in Schools".

Chetty, Raj and Nathaniel Hendren (2018). "The Impacts of Neighborhoods on Intergenerational Mobility I: Childhood Exposure Effects*". *The Quarterly Journal of Economics*.

Chetty, Raj, Nathaniel Hendren, and Lawrence F. Katz (2016). "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment". *American Economic Review*.

Chyn, Eric and Lawrence F. Katz (2021). "Neighborhoods Matter: Assessing the Evidence for Place Effects". *Journal of Economic Perspectives*.

Cook, Philip J., Jens Ludwig, Sudhir Venkatesh, and Anthony A. Braga (2007). "Underground Gun Markets". *The Economic Journal*.

Damm, Anna Piil (2014). "Neighborhood Quality and Labor Market Outcomes: Evidence from Quasi-Random Neighborhood Assignment of Immigrants". *Journal of Urban Economics*. Spatial Dimensions of Labor Markets.

Damm, Anna Piil and Christian Dustmann (2014). "Does Growing Up in a High Crime Neighborhood Affect Youth Criminal Behavior?" *The American Economic Review*.

Damm, Anna Piil and Cédric Gorinas (2020). "Prison as a Criminal School: Peer Effects and Criminal Learning behind Bars". *The Journal of Law and Economics*.

Daniele, Gianmarco and Gemma Dipoppa (2017). "Mafia, Elections and Violence against Politicians". *Journal of Public Economics*.

De Feo, Giuseppe and Giacomo Davide De Luca (2017). "Mafia in the Ballot Box". *American Economic Journal: Economic Policy*.

Dell, Melissa (2015). "Trafficking Networks and the Mexican Drug War". *American Economic Review*.

Deming, David J. (2011). "Better Schools, Less Crime? *". *The Quarterly Journal of Economics*.

Densley, James A. (2012). "Street Gang Recruitment: Signaling, Screening, and Selection". *Social Problems*.

Densley, James A. and David C. Pyrooz (2020). "The Matrix in Context: Taking Stock of Police Gang Databases in London and Beyond". *Youth Justice*.

Dooley, Brendan D., Alan Seals, and David Skarbek (2014). "The Effect of Prison Gang Membership on Recidivism". *Journal of Criminal Justice*.

Dustmann, Christian, Albrecht Glitz, Uta Schönberg, and Herbert Brücker (2016). "Referral-Based Job Search Networks". *The Review of Economic Studies*.

Dustmann, Christian and Rasmus Landersø (2021). "Child's Gender, Young Fathers' Crime, and Spillover Effects in Criminal Behavior". *Journal of Political Economy*.

Dustmann, Christian, Mikkel Mertz, and Anna Okatenko (2023). "Neighbourhood Gangs, Crime Spillovers and Teenage Motherhood". *The Economic Journal*.

Eriksson, Karin Hederos, Randi Hjalmarsson, Matthew J. Lindquist, and Anna Sandberg (2016). "The Importance of Family Background and Neighborhood Effects as Determinants of Crime". *Journal of Population Economics*.

Esbensen, Finn-Aage and Cheryl L. Maxson, eds. (2012). *Youth Gangs in International Perspective: Results from the Eurogang Program of Research*.

Finlay, Keith, Michael Mueller-Smith, and Brittany Street (2023). "Children's Indirect Exposure to the U.S. Justice System: Evidence From Longitudinal Links between Survey and Administrative Data*". *The Quarterly Journal of Economics*.

Gee, Laura K., Jason Jones, and Moira Burke (2017). "Social Networks and Labor Markets: How Strong Ties Relate to Job Finding on Facebook's Social Network". *Journal of Labor Economics*.

Gerell, Manne, Per-Olof Hallin, Kim Nilvall, and Stig Westerdahl (2020). *Att vända utvecklingen : från utsatta områden till trygghet och delaktighet*.

Gerell, Manne, Mia Puur, and Nicklas Guldåker (2022). "Swedish Conditions? Characteristics of Locations the Swedish Police Label as Vulnerable". *Nordic Journal of Urban Studies*.

Gerell, Manne, Joakim Sturup, Mia-Maria Magnusson, Kim Nilvall, Ardavan Khoshnood, and Amir Rostami (2021). "Open Drug Markets, Vulnerable Neighbourhoods and Gun Violence in Two Swedish Cities". *Journal of Policing, Intelligence and Counter Terrorism*.

Granovetter, Mark S. (1973). "The Strength of Weak Ties". *American Journal of Sociology*.

— (1983). "The Strength of Weak Ties: A Network Theory Revisited". *Sociological Theory*.

Grogger, Jeffrey (2002). "The Effects of Civil Gang Injunctions on Reported Violent Crime: Evidence from Los Angeles County". *The Journal of Law & Economics*.

Grönqvist, Hans, Susan Niknami, Mårten Palme, and Mikael Priks (2024). "The Intergenerational Effects of Parental Incarceration". *IFN Working Paper*.

Gupta, Arpit, Christopher Hansman, and Evan Riehl (2022). *Community Impacts of Mass Incarceration*.

Hashimi, Sadaf, Sara Wakefield, and Robert Apel (2021). "Sibling Transmission of Gang Involvement". *Journal of Research in Crime and Delinquency*.

Hjalmarsson, Randi and Matthew J. Lindquist (2012). "Like Godfather, Like Son: Exploring the Intergenerational Nature of Crime". *Journal of Human Resources*.

Holmlund, Helena, Anna Sjögren, and Björn Öckert (2020). *Jämlikhet i möjligheter och utfall i den svenska skolan*. IFAU - Institute for Evaluation of Labour Market and Education Policy.

Hoxby, Caroline (2000). "The Effects of Class Size on Student Achievement: New Evidence from Population Variation". *The Quarterly Journal of Economics*.

Hällsten, Martin, Ryszard Szulkin, and Jerzy Sarnecki (2013). "Crime as a Price of Inequality? The Gap in Registered Crime between Childhood Immigrants, Children of Immigrants and Children of Native Swedes". *The British Journal of Criminology*.

Imberman, Scott A., Adriana D. Kugler, and Bruce I. Sacerdote (2012). "Katrina's Children: Evidence on the Structure of Peer Effects from Hurricane Evacuees". *American Economic Review*.

Jackson, Matthew O. and Brian W. Rogers (2007). "Meeting Strangers and Friends of Friends: How Random Are Social Networks?" *American Economic Review*.

Johnsen, Julian and Laura Khoury (2024). "Peer Effects in Prison". *SSRN Electronic Journal*.

Junger, Marianne, Jack Greene, Ruth Schipper, Floreyne Hesper, and Veronique Estourgie (2013). "Parental Criminality, Family Violence and Intergenerational Transmission of Crime within a Birth Cohort Special Issue on: Compassionate Criminology: The Legacy of Josine Junger-Tas". *European Journal on Criminal Policy and Research*.

Jönsson, Elin and Erik Nilsson (2019). *Skjutningar i kriminella miljöer: en intervjustudie*.

Kim, Jinho and Jason M. Fletcher (2017). "The Influence of Classmates on Adolescent Criminal Activities in the United States". *Deviant Behavior*.

Kling, Jeffrey R., Jeffrey B. Liebman, and Lawrence F. Katz (2007). "Experimental Analysis of Neighborhood Effects". *Econometrica*.

Kling, Jeffrey R., Jens Ludwig, and Lawrence F. Katz (2005). "Neighborhood Effects on Crime for Female and Male Youth: Evidence from a Randomized Housing Voucher Experiment*". *The Quarterly Journal of Economics*.

Kramarz, Francis and Oskar Nordström Skans (2014). "When Strong Ties Are Strong: Networks and Youth Labour Market Entry". *The Review of Economic Studies*.

Kristoffersen, Jannie Helene Grøne, Morten Visby Krægpøth, Helena Skyt Nielsen, and Marianne Simonsen (2015). "Disruptive School Peers and Student Outcomes". *Economics of Education Review*.

Krüsselmann, Katharina, Pauline Aarten, Sven Granath, Janne Kivivuori, Nora Markwalder, Karoliina Suonpää, Asser Hedegaard Thomsen, Simone Walser, and Marieke Liem (2023). "Firearm Homicides in Europe: A Comparison with Non-Firearm Homicides in Five European Countries". *Global Crime*.

Larsen, Britt Østergaard and Nicolai Kristensen (2017). "Building Human or Criminal Capital? School Peer Effects on Future Offending".

Lavy, Victor and Analía Schlosser (2011). "Mechanisms and Impacts of Gender Peer Effects at School". *American Economic Journal: Applied Economics*.

Lefgren, Lars (2004). "Educational Peer Effects and the Chicago Public Schools". *Journal of Urban Economics*.

Levitt, Steven D. and Sudhir Alladi Venkatesh (2000). "An Economic Analysis of a Drug-Selling Gang's Finances". *The Quarterly Journal of Economics*.

Lindquist, Matthew J. and Yves Zenou (2014). *Key Players in Co-Offending Networks*.

Ludwig, J., G. J. Duncan, and P. Hirschfield (2001). "Urban Poverty and Juvenile Crime: Evidence from a Randomized Housing-Mobility Experiment". *The Quarterly Journal of Economics*.

Ludwig, Jens and Jeffrey R. Kling (2007). "Is Crime Contagious?" *The Journal of Law & Economics*.

Malmberg, Bo, Eva K. Andersson, Michael M. Nielsen, and Karen Haandrikman (2018). "Residential Segregation of European and Non-European Migrants in Sweden: 1990–2012". *European Journal of Population*.

Manski, Charles F. (1993). "Identification of Endogenous Social Effects: The Reflection Problem". *The Review of Economic Studies*.

Melnikov, Nikita, Carlos Schmidt-Padilla, and Maria Micaela Sviatschi (2020). *Gangs, Labor Mobility and Development*.

Moffitt, Robert A. (2001). "Policy Interventions, Low-Level Equilibria, and Social Interactions". *Social Dynamics*. Ed. by Steven N. Durlauf and H. Peyton Young.

Monteiro, Joana and Rudi Rocha (2017). "Drug Battles and School Achievement: Evidence from Rio de Janeiro's Favelas". *The Review of Economics and Statistics*.

Montgomery, James D. (1991). "Social Networks and Labor-Market Outcomes: Toward an Economic Analysis". *American Economic Review*.

Morselli, Carlo, Cynthia Giguère, and Katia Petit (2007). "The Efficiency/Security Trade-off in Criminal Networks". *Social Networks*.

Murray, Joseph and David P. Farrington (2008). "The Effects of Parental Imprisonment on Children". *Crime and Justice*.

Norris, Samuel, Matthew Pecenco, and Jeffrey Weaver (2021). "The Effects of Parental and Sibling Incarceration: Evidence from Ohio". *American Economic Review*.

Ohinata, Asako and Jan C. van Ours (2013). "How Immigrant Children Affect the Academic Achievement of Native Dutch Children". *The Economic Journal*.

Oreopoulos, Philip (2003). "The Long-Run Consequences of Living in a Poor Neighborhood*". *The Quarterly Journal of Economics*.

Ouss, Aurelie (2011). *Prison as a School of Crime: Evidence from Cell-Level Interactions*.

Patacchini, Eleonora and Yves Zenou (2008). "The Strength of Weak Ties in Crime". *European Economic Review*.

Philippe, Arnaud (2024). "Building Criminal Networks in Prison: Evidence from French Cellmates".

Pinotti, Paolo (2015). "The Economic Costs of Organised Crime: Evidence from Southern Italy". *The Economic Journal*.

Polismyndigheten (2021). *Lärdomar från Encrochat*.

Polismyndigheten (2024). *Cylindermodellen – information*.

— (2025). *Svensk polis leder operation Grimm*.

Pyrooz, David C. and Gary Sweeten (2015). "Gang Membership Between Ages 5 and 17 Years in the United States". *Journal of Adolescent Health*.

Rajkumar, Karthik, Guillaume Saint-Jacques, Iavor Bojinov, Erik Brynjolfsson, and Sinan Aral (2022). "A Causal Test of the Strength of Weak Ties". *Science*.

Regeringskansliet (2021). *Slopad straffrabatt för unga myndiga vid allvarlig brottslighet*.

Ross, Stephen L. (2011). "Social Interactions within Cities: Neighborhood Environments and Peer Relationships". *The Oxford Handbook of Urban Economics and Planning*. Ed. by Nancy Brooks, Kieran Donaghy, and Gerrit-Jan Knaap.

Rostami, Amir (2017). "Street-Gang Violence in Swedenis a Growing Concern". *Sociologisk Forskning*.

Rostami, Amir and Hernan Mondani (2023). *2023:3 Kriminella på kartan – en ESO-rapport om den organiserade brottslighetens geografi*.

Sacerdote, Bruce (2001). "Peer Effects with Random Assignment: Results for Dartmouth Roommates". *The Quarterly Journal of Economics*.

Sarnecki, Jerzy (2001). *Delinquent Networks: Youth Co-Offending in Stockholm*. Cambridge Studies in Criminology.

Sjögren, Anna, Anton Sundberg, and Demid Getik (2024). *Migration Inflow and the School Performance of Incumbent Students*. IFAU - Institute for Evaluation of Labour Market and Education Policy.

Skarbek, David (2010). "Putting the "Con" into Constitutions: The Economics of Prison Gangs". *Journal of Law, Economics, & Organization*.

Sobrino, Fernanda (2020). "Mexican Cartel Wars: Fighting for the U.S. Opioid Market". *Working Paper*.

SOM-institutet (2024). *Svenska trender 1986–2023*. SOM-institutet, Göteborgs universitet.

Stevenson, Megan (2017). "Breaking Bad: Mechanisms of Social Influence and the Path to Criminality in Juvenile Jails". *The Review of Economics and Statistics*.

Sturup, Joakim, Manne Gerell, and Amir Rostami (2020). "Explosive Violence: A near-Repeat Study of Hand Grenade Detonations and Shootings in Urban Sweden". *European Journal of Criminology*.

Sturup, Joakim, Amir Rostami, Hernan Mondani, Manne Gerell, Jerzy Sarnecki, and Christofer Edling (2019). "Increased Gun Violence Among Young Males in Sweden: A Descriptive National Survey and International Comparison". *European Journal on Criminal Policy and Research*.

Suonpää, Karoliina, Janne Kivivuori, Pauline Aarten, Andri Ahven, Sven Granath, Nora Markwalder, Sara Skott, Asser H. Thomsen, Simone Walser, and Marieke Liem (2024). "Homicide Drop in Seven European Countries: General or Specific across Countries and Crime Types?" *European Journal of Criminology*.

Sviatschi, Maria Micaela (2022a). "Making a NARCO: Childhood Exposure to Illegal Labor Markets and Criminal Life Paths". *Econometrica*.

— (2022b). "Spreading Gangs: Exporting US Criminal Capital to El Salvador". *American Economic Review*.

SVT (2024). *Svenska tonåringar anlitas av kriminella gäng i Danmark*.

— (2025). *Uppdrag granskning – Gängskolan*.

Säkerhetspolisen (2024). *Iran använder kriminella i Sverige*.

UNODC (2023). *Global Study on Homicide*.

Åslund, Olof, Per-Anders Edin, Peter Fredriksson, and Hans Grönqvist (2011). "Peers, Neighborhoods, and Immigrant Student Achievement: Evidence from a Placement Policy". *American Economic Journal: Applied Economics*.

A Appendix Figures

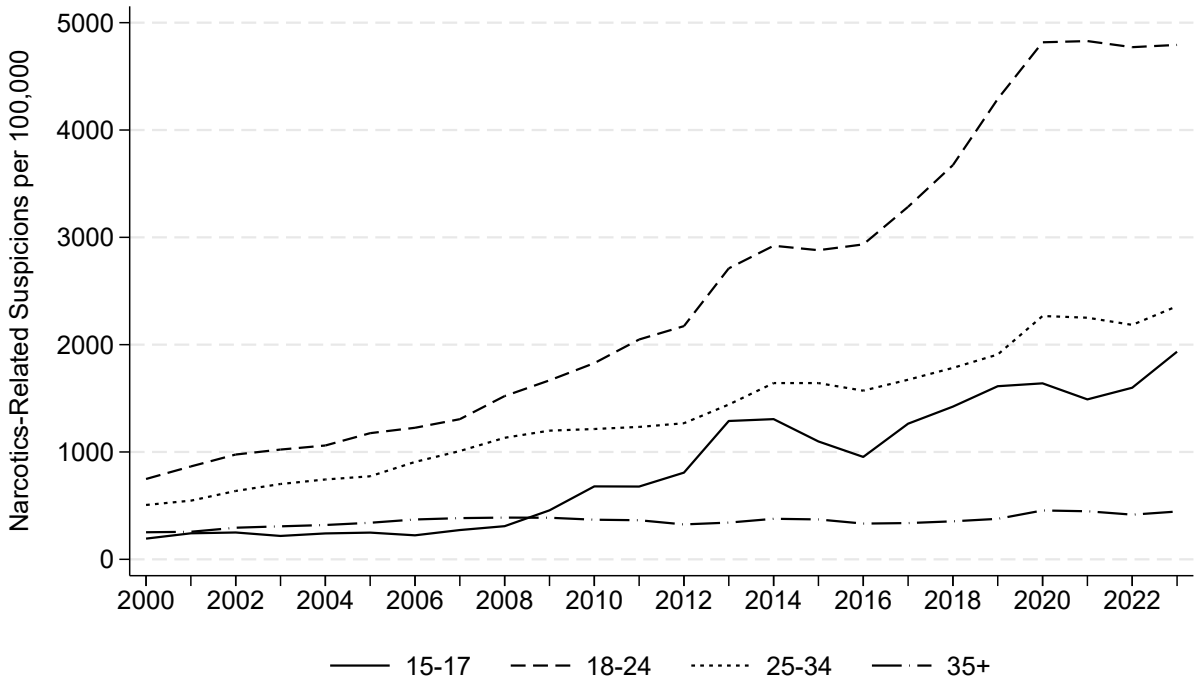


Figure A1: Narcotics-Related Suspicions per 100,000 by Age Group, 2000–2023

Note.—Annual number of narcotics-related suspicions per 100,000 individuals in each age group (15–17, 18–24, 25–34, and 35 and older), computed from the BRÅ suspects register for 2000–2023.

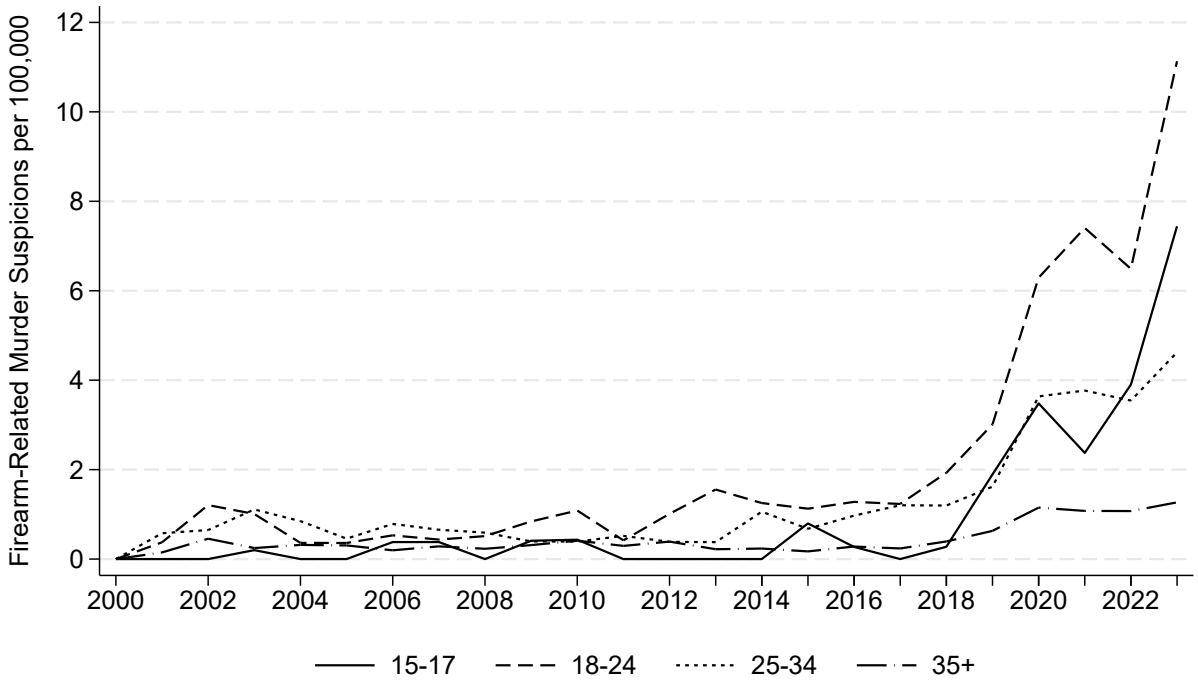


Figure A2: Firearm-Related Murder Suspicions per 100,000 by Age Group, 2000–2023

Note.—Annual number of firearm-related murder suspicions per 100,000 individuals in each age group (15–17, 18–24, 25–34, and 35 and older), computed from the BRÅ suspects register for 2000–2023.

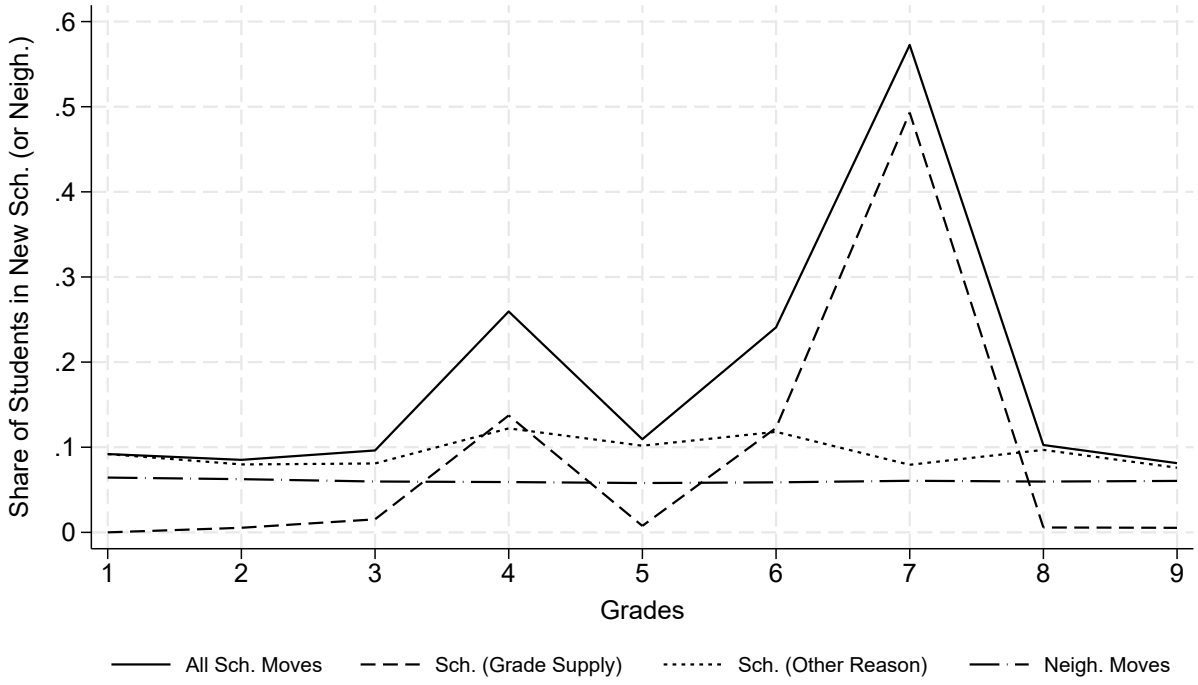
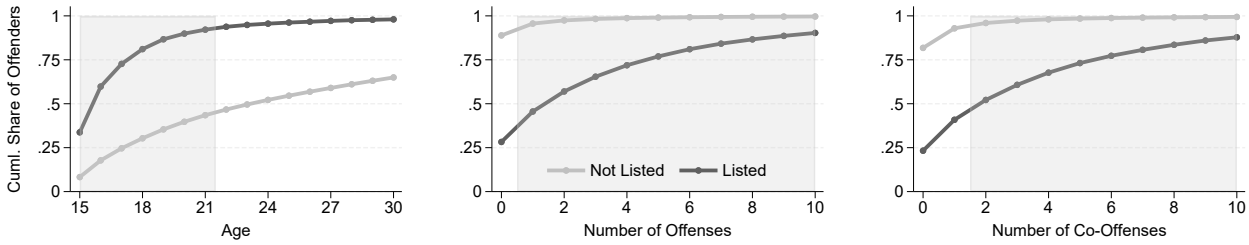


Figure A3: Share of Students in a New School or Neighborhood, by Grade

Note.—Share of students in each grade from 1 to 9 who attend a new school, or live in a new residential neighborhood, compared with the previous grade, 2013–2019. *All Sch. Moves* covers all school changes, which are split into changes because the previous school does not offer the next grade (*Grade Supply*) and changes for other reasons (*Other Reason*). *Neigh. Moves* are changes of residential neighborhood. School changes peak at the start of grade 7, with smaller peaks in grades 4 and 6.



(a) Age at First Offense (b) Gang-Common Offenses (c) Repeated Co-Offending

Figure A4: Onset, Offense Types, and Co-Offending of Listed and Other Offenders

Note.—Cumulative distributions, for offenders listed and not listed in the Gang Register, of (a) age at the first recorded offense, (b) the number of gang-common offenses (murder, weapons possession, aggravated narcotics offenses, robbery, coercion, and extortion), and (c) the number of co-offenses in non-aggravated narcotics, assault, and property offenses combined. Shaded areas mark the values that meet each part of the rule that defines gang-related offending: a first offense by age 21, at least one gang-common offense, and at least two such co-offenses. The sample covers offenses committed between 2007 and 2023.

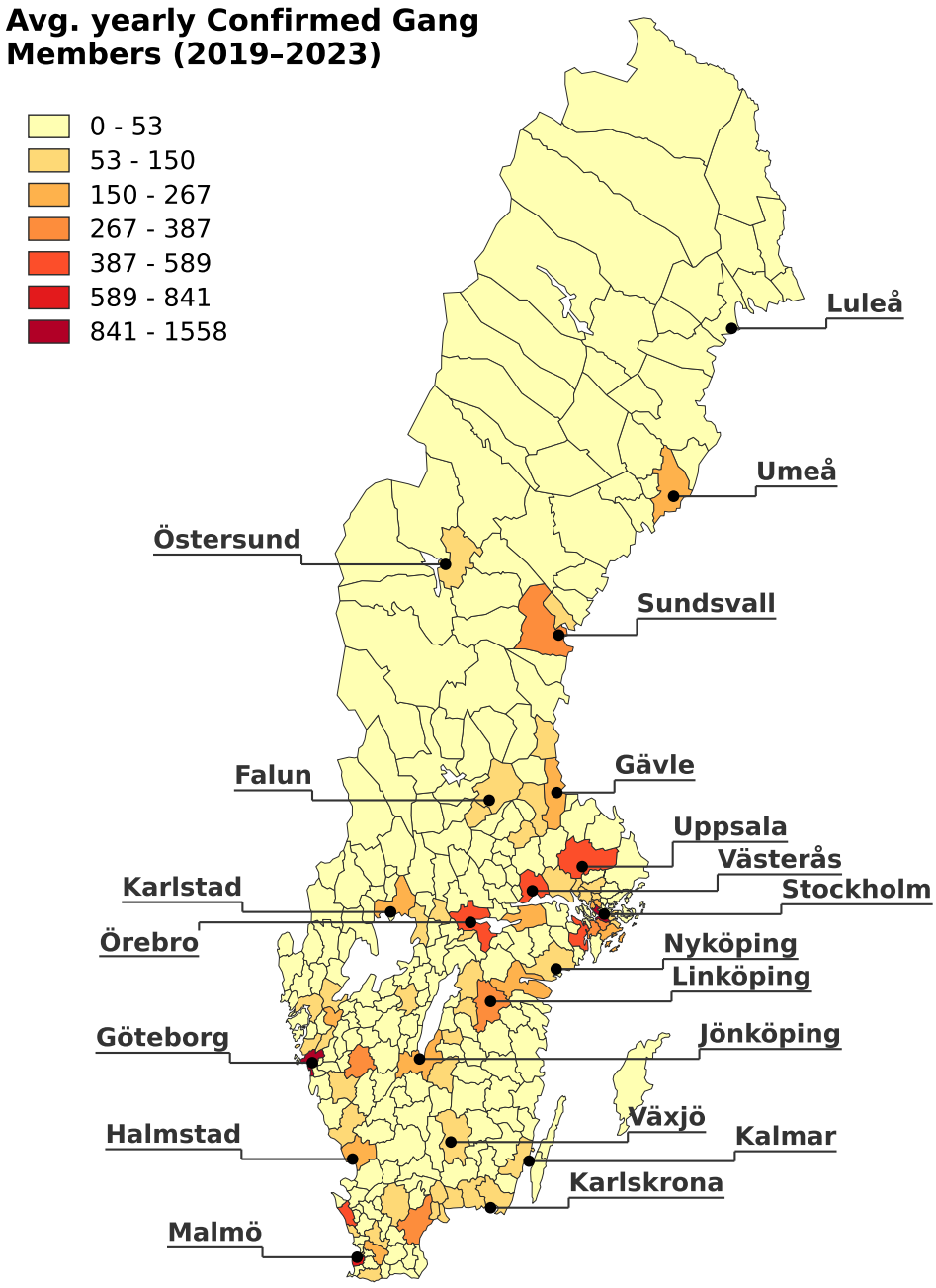


Figure A5: Individuals Listed in the Gang Register by Municipality of Residence

Note.—Average yearly number of individuals listed in the Gang Register in 2019–2023, by municipality of registered residence (shown as confirmed gang members in the legend). Categories follow Jenks natural breaks. Labels mark the county capitals.

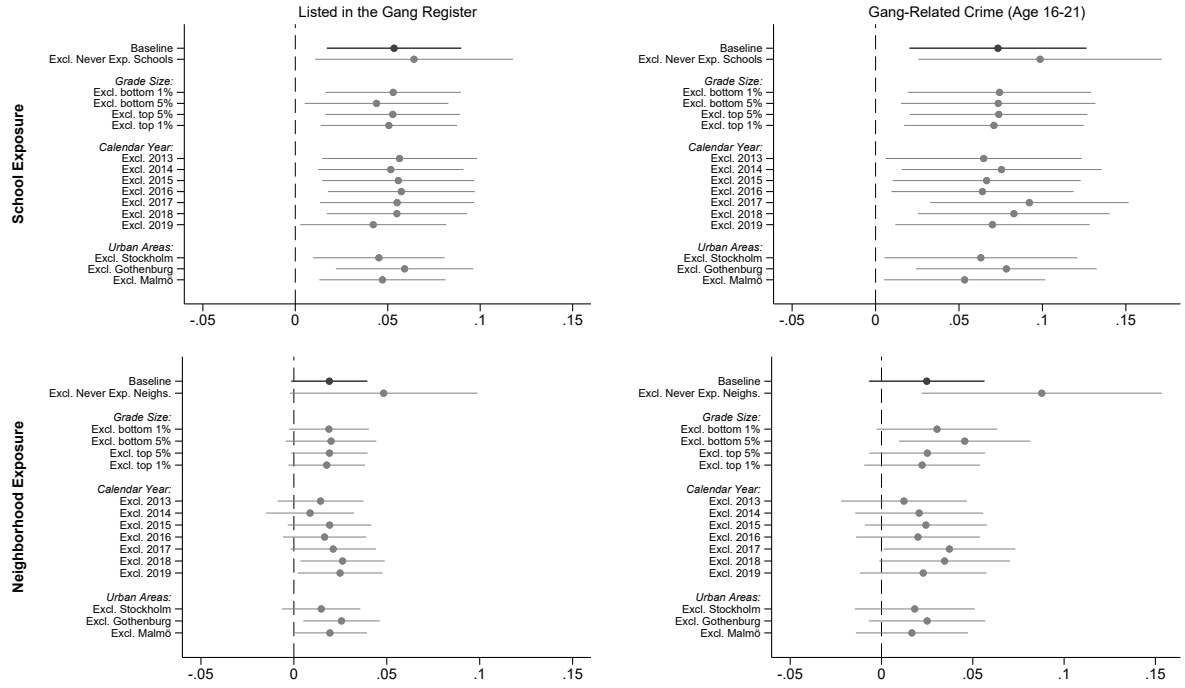


Figure A6: Main Estimates Under Alternative Sample Restrictions

Note.—Each row reports the coefficient on exposure from a separate estimate of (3), with calendar-year and school–neighborhood fixed effects, after the sample restriction listed on the vertical axis. *Baseline* uses all male students who entered grade 7 in 2013–2019 and whose father and older brothers have no prior gang-related offending. The upper panels use Brother-Link Exposure, the share of linked peers (students with an older brother who had gang-related offending before entering grade 7) among the other students in grade 7 at the same school in the same year, and the lower panels the corresponding share among same-age peers in the student's neighborhood. The left panels report Gang Register listing and the right panels gang-related offending between ages 16 and 21. *Excl. Never Exp. Schools (Neighs.)* drops schools (neighborhoods) in which no cohort has a linked peer; the *Grade Size* rows drop the smallest or largest 1% or 5% of cohorts; the *Calendar Year* rows drop one year of entry into grade 7 at a time; and the *Urban Areas* rows drop Stockholm, Gothenburg, or Malmö. Bars show 95% confidence intervals based on standard errors two-way clustered by school and neighborhood.

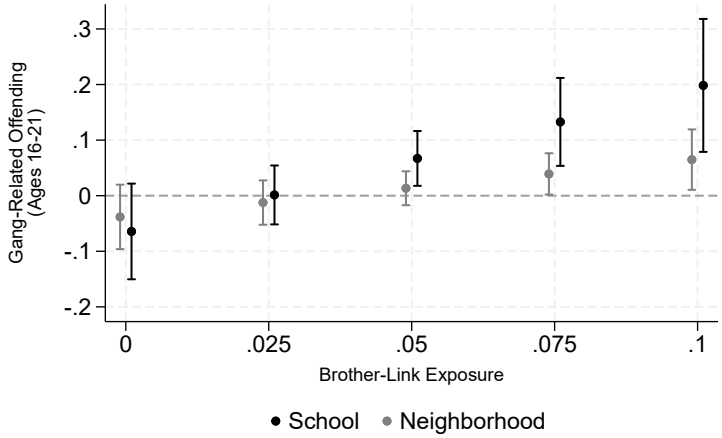


Figure A7: Marginal Effect of Brother-Link Exposure at Different Exposure Levels

Note.—Marginal effects of exposure on gang-related offending between ages 16 and 21, from a variant of (3) that adds the square of exposure, evaluated at exposure levels from 0 to 0.10. Black points use Brother-Link Exposure, the share of linked peers (students with an older brother who had gang-related offending before entering grade 7) among the other students in grade 7 at the same school in the same year, and gray points the corresponding share among same-age peers in the student's neighborhood. The regressions include calendar-year and school–neighborhood fixed effects. Bars show 95% confidence intervals based on standard errors two-way clustered by school and neighborhood.

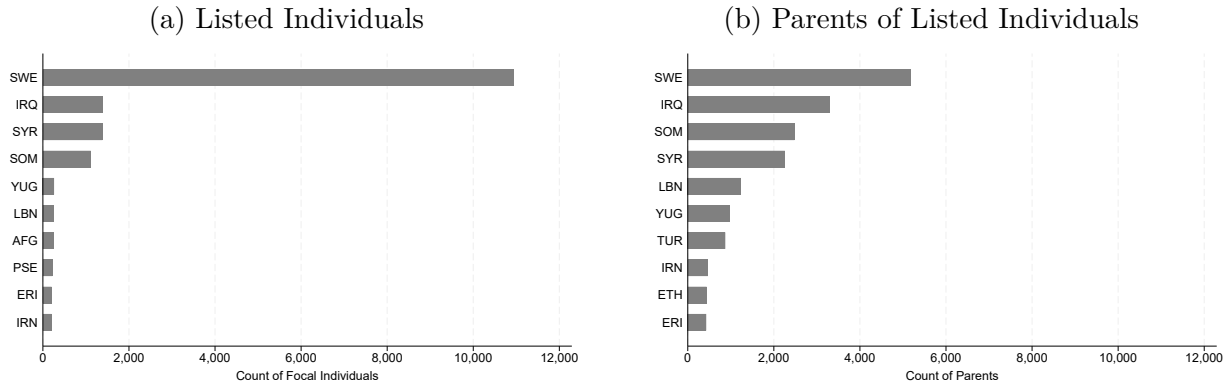


Figure A8: Countries of Birth of Listed Individuals and Their Parents

Note.—Panel (a) shows the number of individuals listed in the Gang Register, and panel (b) the number of their parents, born in each of the ten most common countries of birth, shown by three-letter country codes (YUG: the former Yugoslavia). Sweden is the most common country of birth in both panels.

B Appendix Tables

Table A1: Summary Statistics for Individuals Listed in the Gang Register

	N	Mean
A. Demographics		
Year of Birth	18490	1998
Male	18490	0.94
Foreign Born	18490	0.41
Foreign Background	18490	0.79
B. Household Characteristics While a Minor (Conditional on Observable Records)		
Lived in a single-parent household (Ever)	15270	0.64
Lived in a vulnerable neighborhood (Ever)	15280	0.49
C. Offending and Co-Offending		
Any offense	18490	0.77
Solo Offense	18490	0.66
1+ Co-Offenders	18490	0.67
5+ Co-Offenders	18490	0.38
10+ Co-Offenders	18490	0.18
D. Family Links to Other Listed Individuals (Conditional on Observable Relatives)		
Fathers	15280	0.03
Older Brothers	10835	0.23
Uncles	5732	0.06
Older Cousins	4309	0.10

Note.—Number of observations (N) and means for the 18,490 individuals listed in the Gang Register between 2019 and 2024. Panel A reports demographics. Panel B reports whether individuals ever lived in a single-parent household or a vulnerable neighborhood while a minor, among those whose records can be observed. Panel C reports the shares with any recorded offense, with an offense committed without a co-offender, and with at least 1, 5, or 10 distinct co-offenders, where co-offenders are individuals recorded in the same criminal case. Panel D reports the shares whose father, older brother, uncle, or older cousin is also listed, among individuals with an observed relative of that type. Observation counts vary because relatives or records are missing for some individuals; for example, 3,210 individuals lack father identifiers, often because they migrated to Sweden without their fathers.

Table A2: Convictions and Suspicions by Offense Type and Listing Status

Panel A:						Convictions					
	Not Listed in the Gang Register						Listed in the Gang Register				
	Freq.	Age	Male	Foreign	Uniq. IDs		Freq.	Age	Male	Foreign	Uniq. IDs
Traffic	633,353	39.16	0.85	0.29	393,029	Narcotics	48,939	22.66	0.96	0.63	11,481
Narcotics	474,740	29.03	0.83	0.28	196,303	Traffic	23,436	24.27	0.97	0.61	7,603
Property	425,019	32.79	0.66	0.33	248,995	Property	15,850	23.35	0.95	0.60	6,740
Violent	236,903	33.02	0.83	0.32	167,313	Violent	15,266	22.52	0.97	0.63	7,501
Other	176,354	36.65	0.79	0.30	150,469	Weapon	10,525	23.73	0.98	0.58	5,323
Weapon	91,939	32.25	0.89	0.26	56,125	Other	8,680	23.58	0.97	0.61	5,577
Sex	21,917	35.59	0.99	0.40	20,232	Sex	457	22.88	1.00	0.73	436
Panel B:						Suspicions					
	Not Listed in the Gang Register						Listed in the Gang Register				
	Freq.	Age	Male	Foreign	Uniq. IDs		Freq.	Age	Male	Foreign	Uniq. IDs
Other	1,110,459	37.18	0.77	0.34	546,425	NarcUse	70,012	21.88	0.96	0.65	13,696
TheftBurg	680,620	30.44	0.60	0.36	271,076	NarcPoss	69,235	22.13	0.96	0.64	12,460
Assault	679,561	34.27	0.76	0.40	389,307	Other	64,307	22.78	0.96	0.65	11,604
NarcUse	609,946	27.54	0.81	0.27	231,271	TheftBurg	40,532	22.39	0.95	0.63	8,900
NarcPoss	442,792	28.68	0.82	0.30	170,179	Assault	35,395	22.23	0.96	0.66	10,497
Threat	417,211	36.80	0.78	0.38	242,039	Traffic	20,708	23.80	0.96	0.60	7,125
Traffic	208,263	34.03	0.83	0.30	115,090	Threat	17,521	23.41	0.96	0.63	6,860
Fraud	196,734	34.45	0.66	0.40	107,548	NarcPossUse	13,913	22.97	0.97	0.62	6,381
Vandalism	173,121	30.55	0.83	0.26	115,569	Knife	13,833	23.48	0.98	0.58	5,498
Knife	122,494	31.31	0.90	0.28	60,825	NarcDist	13,594	22.90	0.97	0.63	6,294
PeaceBreach	109,760	36.58	0.80	0.38	85,250	Robbery	10,620	21.27	0.98	0.68	5,395
VioOfficer	90,479	31.54	0.81	0.31	63,374	Vandalism	10,039	22.65	0.97	0.59	5,141
Tax	91,846	45.47	0.81	0.36	61,283	Fraud	9,662	24.00	0.95	0.59	3,844
NarcPossUse	74,970	30.69	0.82	0.29	49,385	Gun	7,390	21.93	0.98	0.65	4,481
NarcDist	66,956	30.32	0.82	0.30	44,340	StolGoods	7,333	24.21	0.97	0.58	3,680

Note.—Convictions (Panel A) and suspicions (Panel B) recorded from 2007 onward in the BRÅ convictions and suspects registers, by offense type, separately for individuals not listed and listed in the Gang Register. *Freq.* is the number of convictions or suspicions, *Uniq. IDs* the number of distinct individuals, *Age* their mean age, and *Male* and *Foreign* the shares who are male and who have a foreign background. In Panel B, NarcUse, NarcPoss, NarcPossUse, and NarcDist denote narcotics use, possession, possession or use, and distribution; TheftBurg theft and burglary; VioOfficer violence against an officer; PeaceBreach breach of the peace; and StolGoods stolen goods.

Table A3: Raw and Residualized Variation in Brother- and Father-Link Exposure

	Mean	Std. Dev	Min	Max
Raw Older-Brother-Link Exposure				
School-Grade	0.025	0.025	0.000	1.000
Neighborhood-Grade	0.025	0.034	0.000	0.500
Residualized Older-Brother-Link Exposure				
School-Grade	0.000	0.017	-0.161	0.267
Neighborhood-Grade	0.000	0.024	-0.247	0.436
Raw Father-Link Exposure				
School-Grade	0.013	0.016	0.000	0.500
Neighborhood-Grade	0.013	0.023	0.000	1.000
Residualized Father-Link Exposure				
School-Grade	0.000	0.012	-0.143	0.207
Neighborhood-Grade	0.000	0.018	-0.166	0.409

Note.—Mean, standard deviation, minimum, and maximum of exposure through older brothers (upper part) and fathers (lower part). Brother-Link (Father-Link) Exposure is the share of the other students in a student's peer group whose older brother (father) had gang-related offending before the student entered grade 7. The peer group is the students in grade 7 at the student's school in the same year (*School-Grade*) or the students in the same grade in the student's neighborhood (*Neighborhood-Grade*). Raw exposure is the measure itself, and residualized exposure the residual from a regression of exposure on calendar-year and school–neighborhood fixed effects, which is the variation the estimates use.

Table A4: Summary Statistics for Female Students in Grade 7

	(1) All Students	(2) without Gang-Related Family	(3) with Gang-Related Family	(4) with Gang-Listed Family
A. Outcomes: Post or End of Compulsory School				
Crime Activity (Age 16-21)				
Any	0.07	0.07	0.21	0.22
Gang-Related	0.01	0.01	0.04	0.04
Violent	0.02	0.02	0.07	0.10
Property	0.04	0.03	0.12	0.11
Narcotics	0.02	0.02	0.08	0.07
Weapon	0.00	0.00	0.01	0.01
Other	0.02	0.02	0.05	0.05
Listed in the Gang Register	0.00	0.00	0.01	0.02
Eligiblity to High School	0.90	0.90	0.73	0.66
Merit Score	235.89	237.77	185.42	179.39
Standardized Test (Grade 9)	0.12	0.14	-0.41	-0.63
Mental Health Diagnose (Age 13-15)				
Mood	0.06	0.06	0.08	0.03
Stress	0.09	0.08	0.13	0.06
B. Background				
Foreign Background	0.20	0.19	0.30	0.75
Single Parent Home	0.25	0.24	0.49	0.42
Standardized Test (Grade 6)	0.10	0.12	-0.33	-0.62
Father Characteristics				
Age	45.01	44.94	46.66	45.23
Above Median Labor Income	0.52	0.53	0.20	0.18
Employed, yr t-1	0.84	0.85	0.58	0.49
Yrs. of Schooling	11.85	11.92	9.99	9.34
Dead	0.01	0.01	0.04	0.03
Missing	0.03	0.03	0.01	0.06
Mother Characteristics				
Age	43.17	43.17	43.20	42.36
Above Median Labor Income	0.50	0.51	0.28	0.17
Employed, yr t-1	0.84	0.84	0.66	0.48
Yrs. of Schooling	12.77	12.84	10.93	9.61
Dead	0.00	0.00	0.01	0.01
Missing	0.00	0.00	0.00	0.01
C. Peer Groups				
Peers in school-grade	95.15	95.34	90.24	89.24
Peers in neighborhood-grade	49.27	49.30	48.54	54.73
Peers in neighborhood-school-grade	22.40	22.50	19.95	20.42
Observations	328,150	316,244	11,906	2,707

Note.—Means for four groups of female students who entered grade 7 in 2013–2019: (1) all female students; (2) students whose father and older brothers have no prior gang-related offending; (3) students whose father or an older brother has prior gang-related offending; and (4) students with at least one father or brother later listed in the Gang Register. Relatives' prior offending covers offenses from the year the student turns seven through the year before she enters grade 7. Crime outcomes are measured between ages 16 and 21, Gang Register listing between 2019 and 2024, school outcomes at the end of compulsory school, and mental-health diagnoses between ages 13 and 15. Peer groups count the other students in the same grade at the student's school, in her neighborhood, and in both. Table 1 reports the same statistics for male students.

Table A5: Brother-Link Exposure and Predetermined Characteristics, by Peer Group

Peer Environment:	*Dep. Var.: Exposure Defined By Brother Gang-Related Offending*			
	School-Grade		Neighborhood-Grade	
	(1)	(2)	(3)	(4)
Foreign Background	0.0101**	0.0001	0.0158**	-0.0000
	(0.0010)	(0.0001)	(0.0012)	(0.0002)
Single Parent HH.	0.0017**	0.0001	0.0033**	-0.0000
	(0.0002)	(0.0001)	(0.0002)	(0.0001)
Father Age	-0.0000	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Father Inc. (Below Median)	0.0026**	0.0000	0.0036**	0.0001
	(0.0002)	(0.0001)	(0.0002)	(0.0001)
Father Employed	-0.0003	0.0000	-0.0010*	0.0001
	(0.0003)	(0.0001)	(0.0004)	(0.0002)
Father Comp. School	0.0030**	0.0003*	0.0036**	0.0001
	(0.0003)	(0.0001)	(0.0003)	(0.0002)
Father High School	0.0017**	0.0001	0.0022**	0.0002
	(0.0002)	(0.0001)	(0.0002)	(0.0001)
Father Missing	0.0007	0.0003	0.0009	0.0003
	(0.0008)	(0.0005)	(0.0010)	(0.0007)
Mother Age	-0.0001**	0.0000	-0.0001**	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Mother Inc. (Below Median)	0.0018**	-0.0000	0.0023**	-0.0002
	(0.0002)	(0.0001)	(0.0002)	(0.0001)
Mother Employed	-0.0014**	-0.0000	-0.0022**	-0.0002
	(0.0003)	(0.0001)	(0.0004)	(0.0002)
Mother Comp. School	0.0042**	0.0002	0.0052**	0.0000
	(0.0005)	(0.0002)	(0.0006)	(0.0002)
Mother High School	0.0017**	0.0000	0.0022**	0.0001
	(0.0002)	(0.0001)	(0.0002)	(0.0001)
Mother Missing	0.0010	-0.0003	-0.0024	0.0000
	(0.0013)	(0.0007)	(0.0015)	(0.0010)
Calendar-Year Fixed		✓		✓
School-Neighborhood Fixed		✓		✓
F-Stat	27.9945	1.3135	45.1874	0.8092
p(F)	0.0000	0.1849	0.0000	0.6684
Adj. R^2	0.0626	0.5214	0.0763	0.4497
Dependent Mean	0.0249	0.0249	0.0246	0.0246
Observations	334,398	334,398	334,398	334,398

Note.—Each column regresses Brother-Link Exposure on the student's predetermined characteristics, for male students whose father and older brothers have no prior gang-related offending. Exposure is the share of linked peers, students with an older brother who had gang-related offending before entering grade 7, among the other students in the same grade at the student's school (columns 1–2) or in his neighborhood (columns 3–4). Columns (2) and (4) add calendar-year and school–neighborhood fixed effects. Income and schooling indicators refer to below-median income and to compulsory or upper-secondary schooling as the highest level. The F-test also includes an unreported indicator for missing household information. Standard errors, two-way clustered by school and neighborhood, in parentheses. $(^{**})$ $p < .01$, $(^{*})$ $p < .05$, $(^{+})$ $p < .1$.

Table A6: Father-Link Exposure and Predetermined Characteristics, by Peer Group

Peer Environment:	*Dep. Var.: Exposure Defined By Father Gang-Related Offending*			
	School-Grade		Neighborhood-Grade	
	(1)	(2)	(3)	(4)
Foreign Background	0.0022**	-0.0000	0.0039**	-0.0001
	(0.0003)	(0.0001)	(0.0004)	(0.0001)
Single Parent HH.	0.0009**	0.0000	0.0020**	0.0000
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Father Age	-0.0000*	-0.0000	-0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Father Inc. (Below Median)	0.0011**	0.0000	0.0015**	-0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Father Employed	-0.0004*	-0.0001	-0.0003+	-0.0000
	(0.0002)	(0.0001)	(0.0002)	(0.0001)
Father Comp. School	0.0016**	0.0001	0.0017**	0.0000
	(0.0002)	(0.0001)	(0.0002)	(0.0001)
Father High School	0.0014**	0.0000	0.0013**	0.0000
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Father Missing	0.0006	-0.0001	0.0002	-0.0001
	(0.0005)	(0.0003)	(0.0006)	(0.0005)
Mother Age	-0.0001**	0.0000	-0.0001**	-0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Mother Inc. (Below Median)	0.0008**	0.0001+	0.0012**	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Mother Employed	-0.0003*	0.0001	-0.0007**	-0.0000
	(0.0001)	(0.0001)	(0.0002)	(0.0001)
Mother Comp. School	0.0011**	-0.0001	0.0014**	0.0003+
	(0.0002)	(0.0001)	(0.0002)	(0.0002)
Mother High School	0.0009**	-0.0000	0.0011**	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Mother Missing	-0.0013*	0.0002	-0.0013	0.0015*
	(0.0006)	(0.0005)	(0.0009)	(0.0007)
Calendar-Year Fixed		✓		✓
School-Neighborhood Fixed		✓		✓
F-Stat	26.0884	0.7184	38.6152	1.3630
p(F)	0.0000	0.7679	0.0000	0.1568
Adj. R^2	0.0184	0.3852	0.0189	0.3171
Dependent Mean	0.0131	0.0131	0.0129	0.0129
Observations	334,398	334,398	334,398	334,398

Note.—Each column regresses Father-Link Exposure on the student's predetermined characteristics, for male students whose father and older brothers have no prior gang-related offending. Exposure is the share of the other students in the same grade at the student's school (columns 1–2) or in his neighborhood (columns 3–4) whose father had gang-related offending before the student entered grade 7. Columns (2) and (4) add calendar-year and school–neighborhood fixed effects. Income and schooling indicators refer to below-median income and to compulsory or upper-secondary schooling as the highest level. The F-test also includes an unreported indicator for missing household information. Standard errors, two-way clustered by school and neighborhood, in parentheses. (**) $p < .01$, (*) $p < .05$, (+) $p < .1$.

Table A7: Reshuffling Test: Observed versus Randomly Formed Cohorts

	Total	Tested	Rejected at 5% (%)
Schools			
Pearson (cohort counts)	2,159	1,740	4.89
Kolmogorov–Smirnov	2,159	1,740	3.22
Binned chi-squared	2,159	1,740	1.32
Neighborhoods			
Pearson (cohort counts)	3,361	2,967	4.88
Kolmogorov–Smirnov	3,361	2,967	2.66
Binned chi-squared	3,361	2,967	2.12

Note.—The test compares each observed grade-7 school cohort with simulated cohorts formed at random. For each observed cohort, I draw 4,999 simulated cohorts of the same size from all students observed in grade 7 at the same school over the sample period, compute the share of linked peers (students with an older brother who had gang-related offending before entering grade 7) in each, and calculate an empirical p-value equal to the share of simulated cohorts with lower exposure than the observed cohort. If cohorts form as if at random, these p-values are uniformly distributed within a school. The Pearson, Kolmogorov–Smirnov, and binned chi-squared tests assess this school by school, and the last column reports the share of tested schools in which uniformity is rejected at the 5% level, which chance alone would put at about 5%. *Total* is the number of schools, and *Tested* excludes schools observed with only one cohort or without a linked peer in any cohort. The neighborhood rows repeat the exercise for students in the same grade living in the same neighborhood.

Table A8: Grade-6 Brother-Link Exposure and Moves Before Grade 7

	School Moves All Students		School Moves Grade 7 Available		Neighborhood Moves All Students	
	(1)	(2)	(3)	(4)	(5)	(6)
School Exposure	0.030		0.015		0.000	
	(0.041)		(0.110)		(0.020)	
Ngh. Exposure		-0.004		-0.039		-0.004
		(0.034)		(0.071)		(0.021)
Observations	280,676	280,676	135,546	135,546	280,676	280,676
Dep. Mean	0.582	0.582	0.138	0.138	0.049	0.049

Note.—Each column reports a regression of a move between grades 6 and 7 on Brother-Link Exposure measured in grade 6: the share of the other students in the same grade at the student's grade-6 school (*School Exposure*, odd columns) or in the student's neighborhood (*Ngh. Exposure*, even columns) whose older brothers have prior gang-related offending. The outcomes are changing schools between grades 6 and 7 among all students (columns 1–2) and among students whose grade-6 school also offers grade 7 (columns 3–4), and changing neighborhoods (columns 5–6). If families moved away from cohorts with many linked peers, grade-6 exposure would predict these moves. Standard errors, two-way clustered by school and neighborhood, in parentheses. $(^{**})$ $p < .01$, $(^{*})$ $p < .05$, $(^{+})$ $p < .1$.

Table A9: Effect of the Number of Linked Peers on Gang Register Listing and Gang-Related Offending

	Listed in the Gang Register				Gang-Related Offense (Ages 16–21)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Brother-Link Peers (Count)	0.0005*	0.0005*	0.0005*	0.0005*	0.0007*	0.0007*	0.0006*	0.0007*
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Focal Controls		✓	✓	✓		✓	✓	✓
Peer Group Controls			✓	✓			✓	✓
Linear Municipality Trends				✓				✓
School Grade Size	✓	✓	✓	✓	✓	✓	✓	✓
Effect (% Mean)	3.6%	3.4%	3.4%	3.3%	2.0%	1.9%	1.8%	2.1%
Dep. Mean	0.0140	0.0140	0.0140	0.0140	0.0350	0.0350	0.0350	0.0350
Observations	334,398	334,398	334,398	334,398	334,398	334,398	334,398	334,398

Note.—Each column reports the coefficient on the number of linked peers from a separate estimate of a variant of (3) that measures exposure by the number, rather than the share, of linked peers among the other students in grade 7 at the same school in the same year, and controls for cohort size. Linked peers are students with an older brother who had gang-related offending before entering grade 7. The sample consists of male students who entered grade 7 in 2013–2019 and whose father and older brothers have no prior gang-related offending. Columns (1)–(4) report effects on Gang Register listing and columns (5)–(8) on gang-related offending between ages 16 and 21. Columns (1) and (5) include calendar-year and school–neighborhood fixed effects and cohort size; columns (2) and (6) add the student's predetermined characteristics (foreign background, single-parent household, and parental income, employment, and education), columns (3) and (7) peer-group composition (the cohort shares of male students and of students with a foreign background), and columns (4) and (8) municipality-specific linear trends. *Effect (% Mean)* is the effect of one additional linked peer relative to the mean of the outcome. Standard errors, two-way clustered by school and neighborhood, in parentheses. (**) $p < .01$, (*) $p < .05$, (+) $p < .1$.

Table A10: Brother-Link Exposure in the Student's Own and Older School Cohorts

	Listed in the Gang Registry		Gang-Related Offense (Ages 16-21)	
	(1)	(2)	(3)	(4)
Panel A. Brother-Link Exposure (Seperate by Grade)				
Grade 7 (Focal's Cohort)	0.051**	0.048**	0.075**	0.069*
	(0.018)	(0.018)	(0.027)	(0.027)
Grade 8 (1 Year Older Cohort)	0.020	0.017	0.026	0.021
	(0.016)	(0.015)	(0.025)	(0.024)
Grade 9 (2 Year Older Cohort)	0.021	0.017	0.003	-0.004
	(0.016)	(0.016)	(0.021)	(0.020)
Panel B. Brother-Link Exposure (Overall in Upper Comp. School)				
Joint (Grade 7, 8 ,9)	0.104**	0.094**	0.123**	0.102*
	(0.033)	(0.033)	(0.047)	(0.046)
Focal Controls		✓		✓
Peer Controls		✓		✓
Observations	333,175	333,175	333,175	333,175
Dep. Mean	0.014	0.014	0.034	0.034

Note.—Each column reports estimates from a separate regression based on (3), with calendar-year and school–neighborhood fixed effects. Panel A includes three exposure measures in the same regression: the share of linked peers in the student's own grade-7 cohort and in the cohorts one and two years above him at the same school, which are in grades 8 and 9 when he enters grade 7. Panel B uses a single measure, the share of linked peers across all three cohorts. Linked peers are students with an older brother with prior gang-related offending. The sample consists of male students who entered grade 7 in 2013–2019, whose father and older brothers have no prior gang-related offending, and who have peers observed in each of grades 7, 8, and 9 at the same school. Columns (1) and (2) report Gang Register listing and columns (3) and (4) gang-related offending between ages 16 and 21; columns (2) and (4) add the student's predetermined characteristics and peer-group composition. Standard errors, two-way clustered by school and neighborhood, in parentheses. (**) $p < .01$, (*) $p < .05$, (+) $p < .1$.

Table A11: Effects by Whether the Linked Peers' Older Brothers Were Sentenced to Prison

	(1) Any Offense (16–21)	(2) Co-Offend with Linked Peer	(3) Gang-Related Offense (16–21)	(4) Listed in the Register	(5) Co-Offend with Brother	(6) Co-Offend with Gang
Brother-Link Exposure, by whether linked peers' older brothers were sentenced to prison when entering and during grade 7						
None/Some sentenced to prison	0.207**	0.099**	0.079**	0.059**	0.059**	0.057*
	(0.044)	(0.020)	(0.027)	(0.018)	(0.021)	(0.028)
All sentenced to prison	0.192	0.175	-0.128	-0.139	-0.046	-0.016
	(0.275)	(0.122)	(0.169)	(0.120)	(0.117)	(0.154)
p: None/Some = All	0.956	0.534	0.222	0.093	0.370	0.635
Dep. Mean	0.178	0.011	0.035	0.014	0.013	0.023
Observations	334,398	334,398	334,398	334,398	334,398	334,398

Note.—Each column reports estimates from a separate regression based on (3), with calendar-year and school–neighborhood fixed effects, for male students who entered grade 7 in 2013–2019 and whose father and older brothers have no prior gang-related offending. Brother-Link Exposure, the share of linked peers (students with an older brother who had gang-related offending before entering grade 7) among the other students in grade 7 at the same school in the same year, is split into two measures, included in the same regression, by whether all of a linked peer's older brothers with gang-related offending were sentenced to prison at the start of or during grade 7 (*All sentenced*) or none or only some of them were (*None/Some*). Columns (1) and (2) report general offending: any offense between ages 16 and 21 and co-offending with a linked peer after compulsory school. Columns (4)–(6) report network outcomes: Gang Register listing and co-offending after compulsory school with a linked peer's older brother or with an individual listed in the Gang Register (*Gang*). Column (3) reports gang-related offending between ages 16 and 21. The p-value tests the equality of the two coefficients. Standard errors, two-way clustered by school and neighborhood, in parentheses. $(^{**})$ $p < .01$, $(^{*})$ $p < .05$, $(^{+})$ $p < .1$.

Table A12: Effects by Student Risk Factors: Origin, Household, Prior Achievement, and Income

	Listed in the Gang Register						Gang-Related Offending (Ages 16–21)					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Brother-Link Exposure	0.053**	0.179**	0.130**	0.202**	0.130**	0.355**	0.073**	0.161**	0.216**	0.254**	0.174**	0.443**
	(0.019)	(0.048)	(0.033)	(0.036)	(0.035)	(0.060)	(0.027)	(0.058)	(0.050)	(0.048)	(0.052)	(0.082)
× Swedish-Native		-0.184**				-0.146**		-0.130*				-0.065
		(0.049)				(0.053)		(0.058)				(0.062)
× Two-Parent Household			-0.106**			-0.096**			-0.197**			-0.182**
			(0.035)			(0.035)			(0.050)			(0.047)
× Prior Achievement > 1st Quartile				-0.230**		-0.201**				-0.281**		-0.246**
				(0.035)		(0.033)				(0.047)		(0.045)
× HH. Income > 1st Quartile					-0.117**	-0.004					-0.154**	-0.054
					(0.036)	(0.039)					(0.053)	(0.057)
Observations	334,398	334,398	334,398	334,398	334,398	334,398	334,398	334,398	334,398	334,398	334,398	334,398
Dep. Mean	0.014	0.014	0.014	0.014	0.014	0.014	0.035	0.035	0.035	0.035	0.035	0.035

Note.—Each column reports estimates from a separate regression based on (3), with calendar-year and school–neighborhood fixed effects, for male students who entered grade 7 in 2013–2019 and whose father and older brothers have no prior gang-related offending. Brother-Link Exposure is the share of linked peers, students with an older brother who had gang-related offending before entering grade 7, among the other students in grade 7 at the same school in the same year. Columns (1)–(6) report effects on Gang Register listing and columns (7)–(12) on gang-related offending between ages 16 and 21. Columns (1) and (7) report the effect of exposure alone. The other columns interact exposure with indicators for being Swedish-native, living in a two-parent household, grade-6 achievement above the first quartile, and household income above the first quartile, one at a time in columns (2)–(5) and (8)–(11) and jointly in columns (6) and (12). Each regression also controls for the included indicators (not reported), so the coefficient on exposure gives the effect for students in the corresponding at-risk groups: those with a foreign background, a single parent, or achievement or household income in the bottom quartile. Prior achievement is measured by standardized test scores from the national tests in grade 6. Standard errors, two-way clustered by school and neighborhood, in parentheses. $(^{**})$ $p < .01$, $(^{*})$ $p < .05$, $(^{+})$ $p < .1$.

Table A13: Grade-7 Brother-Link Exposure and School Changes in Grades 8 and 9

	Changing School in Grade 8 or 9					
	(1)	(2)	(3)	(4)	(5)	(6)
Brother-Link Exposure	0.192	0.129	0.231^{+}	0.104	0.199	0.127
	(0.117)	(0.126)	(0.126)	(0.122)	(0.121)	(0.143)
× Swedish-Native		0.089				0.082
		(0.106)				(0.106)
× Two-Parent Household			-0.055			-0.069
			(0.063)			(0.062)
× Prior Achievement > 1st Quartile				0.134*		0.144*
				(0.065)		(0.064)
× HH. Income > 1st Quartile					-0.011	-0.060
					(0.082)	(0.078)
Observations	230,591	230,591	230,591	230,591	230,591	230,591
Dep. Mean	0.146	0.146	0.146	0.146	0.146	0.146

Note.—Each column reports estimates from a regression of an indicator for changing school in grade 8 or 9 on grade-7 Brother-Link Exposure, with calendar-year and school–neighborhood fixed effects, for the cohorts entering grade 7 in 2013–2017, whose moves are observed through 2019. Brother-Link Exposure is the share of linked peers, students with an older brother who had gang-related offending before entering grade 7, among the other students in grade 7 at the same school in the same year. Column (1) reports the coefficient on exposure; columns (2)–(5) add, one at a time, its interactions with indicators for being Swedish-native, living in a two-parent household, grade-6 achievement above the first quartile, and household income above the first quartile, and column (6) includes all four. Standard errors, two-way clustered by school and neighborhood, in parentheses. (**) $p < .01$, (*) $p < .05$, ($^{+}$) $p < .1$.