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Changes in Personal Social Networks across Individuals Leaving Their Street Gang: Just What Are Youth Leaving Behind?

Caterina G. Roman ^{1,*} , Meagan Cahill ² and Lauren R. Mayes ³

¹ Department of Criminal Justice, Temple University, Philadelphia, PA 19122, USA

² RAND Corporation, Arlington, VA 22202, USA; mcahill@rand.org

³ Department of Criminology, Vancouver Island University, Nanaimo, BC V9R 5S5, Canada; Lauren.Mayes@viu.ca

* Correspondence: Croman@temple.edu

Abstract: Despite a small but growing literature on gang disengagement and desistance, little is known about how social networks and changes in networks correspond to self-reported changes in street gang membership over time. The current study describes the personal or “ego” network composition of 228 street gang members in two east coast cities in the United States. The study highlights changes in personal network composition associated with changes in gang membership over two waves of survey data, describing notable differences between those who reported leaving their gang and fully disengaging from their gang associates, and those who reported leaving but still participate and hang out with their gang friends. Results show some positive changes (i.e., reductions) in criminal behavior and many changes toward an increase in prosocial relationships for those who fully disengaged from their street gang, versus limited changes in both criminal behavior and network composition over time for those who reported leaving but remained engaged with their gang. The findings suggest that gang intervention programs that increase access to or support building prosocial relationships may assist the gang disengagement process and ultimately buoy desistance from crime. The study also has implications for theorizing about gang and crime desistance, in that the role of social ties should take a more central role.

Keywords: desistance; social networks; street gangs; network composition; criminal behavior



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1. Introduction

Mounting evaluation research has shown few successes across the gang intervention landscape. As scholars have grappled with this realization, they have begun to more closely examine the characteristics and motivations related to individuals leaving a gang, and thus attempted to be more precise in defining gang leaving. The term “disengagement” was borrowed from (Bjorgo 2002; Bjorgo and Horgan 2009) on extremist groups to distinguish the process of leaving a gang from that of desisting from crime after de-identifying as a gang member. A former gang member might indicate that they have left the gang, but continue to hang out with members of the group, or participate in some gang activities (and hence, is not fully disengaged). This distinction has been deemed important because research has shown that leaving a gang does not necessarily equate to leaving a life of crime (Melde and Esbensen 2014; Sweeten et al. 2013). Additionally, studies indicate that periods of active gang membership are relatively short, often under one year (Esbensen and David 1993; Krohn and Thornberry 2008). Researchers stress that leaving the gang is a process (i.e., a continually changing social activity, as opposed to a static activity or event), that should be carefully studied, and in conjunction with crime desistance. Fortunately, the literature examining these concomitant issues has grown in the last five years. However, the research is still in its infancy.

The few studies that take a deeper dive to examine the process of leaving a gang generally focus on the relationship between levels of disengagement and involvement in and desistance from crime over time, with little description of the contextual, social and interpersonal changes that may have accompanied changes in gang membership. Scant research examines the nature of the social context of peer groups and other relations that potentially provide support and learning opportunities across the life course, and how changes in relationships may support gang leaving. In this paper, we provide a descriptive picture of gang disengagement across youth living in two mid-eastern cities in the United States, with a specific focus on the social network characteristics of youth while they are in gangs and during the process of leaving and disengaging from the gang. We use a social network analysis framework, and specifically, a personal network research design (PNRD) to study the composition of gang members' extended personal networks as well as changes in those networks. Personal networks are known as "ego networks" or "ego-centric networks" and are not whole networks in the sense that they are not bounded by a group characteristic—such as a gang or organization¹.

Social network analysis refers to both a perspective for examining social relations and a methodological technique for analyzing those relations. The technique has been used in a wide range of academic disciplines dating back to the 1930s but is considered relatively new within the study of criminal behavior (Bouchard and Malm 2016). Relations between actors create patterns and, eventually, structures that in turn shape the behavior of individuals (Marsden 1990; Wasserman and Faust 1994). Social network data describe the contacts, ties, and attachments that one individual has to another. By examining these data, and recreating the social networks of each individual, researchers can reconstruct the patterns of interaction and social structures that influence individual behavior. Within criminology, Krohn (1986) was among the first to suggest that a social network approach was important for understanding delinquent and criminal behavior.

Although using a network analytical framework is relatively new to criminology, relationships and the nature of those bonds at least played some role in theorizing about crime and desistance, particularly with regard to youth delinquency. Social bonding theory and social learning theory have a clear emphasis on relationships, but it was not until the work of Warr (1996) and Sarnecki (2001) that scholars began to more clearly emphasize the importance of bidirectional relations and the resultant interactions and formative dimensions in creating and maintaining delinquent and criminal behavior. Furthermore, understanding the attachments youth and young adults have to other relations outside of peers began to capture more attention as life course and developmental theories emerged (Roman et al. 2017). A PNRD allows a researcher to elucidate a wide array of social ties for the sample's respondents, potentially providing powerful measures of interpersonal influence that may be strongly predictive of behavior (Valente 2010). The decision to study ego networks, versus a whole network such as a specific gang, is a purposeful, theoretical choice to focus on the local, or individual, rather than the global. A nuanced understanding of the range and extent of social attachments of gang members is also important for policy and practice; particular relationships or types of social ties may be possible leverage points for both gang prevention and gang intervention. Furthermore, we know from extant research that keeping youth from gangs and getting youth to leave gangs after they join are worthwhile endeavors that can keep youth from increasing their level of involvement in violence and can lower overall engagement in delinquent behavior (Melde and Esbensen 2014; Sweeten et al. 2013; Valasik et al. 2018; Weerman 2011).

¹ In most cases with PNRD, only the ego is the respondent, and all of the information about the alters and their ties to other alters is obtained from the ego. In contrast, in a survey-based whole network or sociocentric design, every node or actor in the network is a respondent, and information about the ties between nodes (i.e., alters) is obtained from the alters themselves (although sociometric data can be analyzed with an ego-centric focus).

2. Background

2.1. Desistance

Researchers have spent more time theorizing about desistance from crime more generally than about leaving a gang, specifically. Theoretical perspectives on desistance from crime are relevant to leaving a gang, as work examining desistance from a number of negative behaviors (e.g., crime, alcohol, drug use, and gangs) suggests that desistance processes and the causal mechanisms associated with them are similar across different behaviors. In the following paragraphs, we provide a short overview of the crime desistance literature to set the stage for a discussion of gang desistance as it relates to the process of leaving a gang.

In recent years, the application of developmental and life course frameworks has facilitated an understanding of the dynamic processes related to crime desistance. Such frameworks provide a context for situating individuals along dimensions of continuity and change as they age and experience potential turning points. Within these frameworks, life events are unpredictable, yet salient, features that modify or influence criminal careers. The timing of these events in the life course and their relationship to other events or contexts also play a crucial role in behavior. Essentially, a developmental framework emphasizes non-random change in individuals' offending behavior across various stages of development (Loeber and Blanc 1990). The overarching reasons for crime desistance can be internal (i.e., consistent with human agency) or external (i.e., consistent with structures or events) to the individual, or provide influence through a complex interplay.

Depending on one's specific theoretical lens regarding crime desistance, agency and structure can take on more or less dominant roles. In the early years of theorizing about desistance, theorists tended to fall on the extremes of the internal versus external forces spectrum; today there is much less focus on the internal-external debate and more attention paid to the timing of events and processes across the life course, though some theorists may still emphasize the sides of the spectrum. Sampson and Laub's (1990, 1993, 2003) age-graded theory of crime takes the position that structure—external forces—are most salient and asserts that crime occurs when bonds to society are weakened or broken. Social ties are aspects of structural forces generally captured in aggregate form through bonds to or interaction with age-graded institutions such as marriage. Significant life events or socialization experiences in adulthood—called turning points—can modify trajectories of crime in significant ways. These turning points are external—the result of macro-level institutional processes and the resultant roles (Laub and Sampson 2001, 2003; Teruya and Hser 2010)—and hence are largely contextual or situation based. Laub and Sampson view desistance as a process where reductions in offending take place over time and usually occur much earlier than one's last criminal offense in one's criminal career. Therefore, desistance is not simply the termination of one's criminal career.

Theorists that focus less on structure and more on human agency and identity include Bushway and Ray (2013), Maruna (2001, 2016), and Giordano et al. (2002, 2007, 2015). Their perspectives give a more central role to cognitive shifts as internal reevaluations that give voice to dissatisfaction with some aspects of a current lifestyle or can envision prospects for an improved life. These reevaluations induce motivation to change. Such cognitive shifts can be related to maturational processes and/or conscious decisions based on a reappraisal of the costs and benefits of crime (see Ronald and Cornish 1985). Cognitive shifts can lead to changes in the external environment or contexts that support or weaken bonds. Individuals may take on more prosocial roles and relationships or be open to participation in conventional institutions after initial cognitive shifts. Early work by Giordano et al. (2002, 2007) gives particular voice to an individual's own role in selectively appropriating elements in the environment that act as "hooks for change". Strengthened or newly founded relationships can be hooks for change. However, the focus is first on agentic moves because the emphasis is on how individuals respond to the structural obstacles they encounter, not the objective social circumstances. Maruna's (2001, 2004) work focuses on the psychosocial factors that sustain abstinence from offending, and in particular, the

cognitive processes that support the identity of a pro-social self. For both Maruna and Giordano, structural influences are very close behind and sometimes intertwined with the shift in identity, but Bushway and Paternoster, in contrast, postulate that offenders first desire to change and that desire to change is accompanied by a shift in identity that precedes any shift to prosocial networks or prosocial behavior.

Some desistance theorists view changes in offending as more of a balanced interaction between structural forces and human agency and do not necessarily impose a causal ordering on the factors that create change (see, for instance, [Bottoms et al. 2004](#); [Farrall 2002](#); [McNeill 2006, 2016](#); [McNeill and Weaver 2010](#); [Weaver 2012, 2016](#)). [Weaver \(2012, 2016; Weaver and McNeill 2015\)](#), drawing on relational sociology, suggests that individuals seek meaningful and consistent ways to refer to themselves (the creation of an identity) and that this reflexive nature cannot be disentangled from the social context, where social ties can take center stage. Weaver argues that past theories are restricted in their capacity to reveal how agentic moves are variously enabled or constrained by the relational contexts and that more focus should be put on the dynamics and properties of social relations.

2.2. Desistance in the Context of Gang Members

Interestingly, much of the scholarship on desistance does not include direct reference to populations who are gang members—when it is gang members who, while in a gang, often exhibit active violent offender careers throughout youth and young adulthood. Furthermore, some of the extant theories do not easily apply to the lives of gang members. For instance, some of the key turning points that have been described in the life course literature are not readily generalizable to gangs because gang youth are younger than marital age, tend not to marry, and do not secure the same prosocial opportunities (e.g., post-secondary education, jobs, military service, etc.) as the average young person ([Carson and Vecchio 2015](#)). Although some of these turning points may be relevant to desistance from crime for gang members, there is likely even more complexity involved in understanding crime desistance when one has a peer group or related social networks that support and reinforce delinquent and criminal behavior. A few recent studies have broadened the types of turning points to include adverse life events and experiences, such as incarceration and violent victimization ([Sampson and Laub 2016](#); [Soyer 2014](#); [Teruya and Hser 2010](#)).

It may be that the desistance literature does not have a related body of studies that include direct reference to gang members because gang desistance has generally been operationalized as leaving a gang and not necessarily associated with the termination of a criminal career. As such, gang desistance historically has been viewed as a separate topic in criminology but intersecting with crime desistance. Scholars began to delve deeper into the meanings and measures around gang desistance in the early 2000s. [Pyrooz and colleagues](#) suggested that gang de-identification—when an individual declares (or responds on a survey) that they no longer belong to a gang—is an event to be distinguished from gang desistance. As described in the introduction, gang desistance falls into the category of being a process, and should be designated as “disengagement” in that disengagement is a process that unfolds over time ([Pyrooz et al. 2014](#); [Pyrooz and Decker 2011](#); [Sweeten et al. 2013](#)). For some gang members, disengagement may equate to steep reductions in levels of involvement with the group, but for others it does not ([Decker and Lauritsen 2002](#); [Pyrooz et al. 2014](#)).

With regard to the gang disengagement process, [Decker et al. \(2014\)](#), in a mixed-method study of 260 former gang members, drew on the four stages in [Ebaugh's \(1988\)](#) role exit theory and applied it to the process of gang disengagement. They described the gang “exit” process as moving through stages: (1) first doubts, where gang members contemplate the symbolic and instrumental value of their current role; (2) weighing alternative roles, where gang members engage in anticipatory socialization of new or different roles; (3) turning points, which function as the crystallization of discontent to act on the aforementioned considerations; and (4) post-exit certification, which works to validate new

roles while inoculating gang members from old ones. They indicated the process was not linear for the gang members in their sample, and that gang members often relapsed to old expectations and roles. Essentially, they stressed that gang members may see themselves with many different identities and roles, both conventional and criminal. Gang members may also vacillate between times of active participation in gang activity and more complete withdrawal from gang ties even after reporting leaving the gang.

Studies conducted before Decker and colleagues' study suggest that when perceptions and objectives of a gang member begin to run opposite to his/her beliefs or priorities, he/she will leave the gang (Spergel 1995; Vigil 1988). Events such as the victimization of friends or an increasing commitment to family can lead a gang member to gradually reduce time spent with other gang members. These earlier studies of the reasons or motivations for leaving a gang led to the development of a framework to organize the different reasons youth and adults may leave a gang. The push-pull categorization, originally conceptualized by Decker and Winkle (1996) with regard to gang entry, divides the reasons for leaving into those that relate to aspects of gang membership that are internal to the gang (pushes) and those that are external to the gang (pulls). Negative occurrences related to the gang are pushes—aspects of life or events that push the individual to begin to desire a more prosocial life. Pushes can be internal aspects such as disillusionment or maturation. These individuals reach a point when the costs of engaging in violence outweigh the benefits (Decker and Lauritsen 2002; Decker and Winkle 1996).

Pull factors are factors that are external to the gang, serving to attract gang members to prosocial others and institutions. These factors can include having a child, getting a job, or other turning-point-like factors that help develop or strengthen bonds to conventional society. Research has shown that push and pull factors often operate in concert (Decker et al. 2014), and one factor may not be sufficient for gang de-identification and/or disengagement. Consistent with Decker and colleagues' research mentioned above, recent research by Roman et al. (2017) that examined reasons for leaving a gang across three large multi-site datasets found that few respondents reported only push or pull factors, but as the average age of the sample decreased, so did the number of reasons provided.

Although the push-pull categorization is not grounded in a particular theory or set of theories, it is apparent that the pull factors closely align with prosocial opportunities and experiences with new or strengthened social relations that offer opportunities and provide support for or reinforcement of a new non-gang or non-offender identity. Similarly, social relations play a salient role in at least two stages of Decker et al.' (2014) disengagement framework that utilizes role exit theory. At stage 2, where gang members are engaging in anticipatory socialization of new or different roles—this "socialization" often involves assessing and re-assessing their involvement with and attachment to other relations. Stage 4—post-exit validation—involves external reference groups, such as family or new friends (p. 276). Indeed, it is possible that relations play a significant role across all gang exit stages and is a key factor in long-term desistance from offending. This aligns with Bersani and Doherty's (2018) recent review of the crime desistance literature. When discussing identity construction, they state: "whereas this divergence between external pressures and internal progress may emerge from individual narratives, successful desistance may hinge on external social networks" (2018, p. 321). Their conclusion includes a mention of research by Giordano et al. (2007) which articulates that emotional maturation is related to the expansion of social interactions during the developmental period of young adulthood and particularly where criminal behavior no longer brings positive reinforcement. Similarly, newer theorizing about crime desistance includes the work of Beth Weaver (2012, 2016), as mentioned earlier, who draws on relational sociology to posit that individuals seek meaningful and consistent ways to refer to themselves (the creation of an identity) and that this reflexive nature cannot be disentangled from the social context. Weaver emphasizes social roles and discusses gang members in that social roles and relationships are particularly relevant for criminal offenders who are embedded in criminal groups/gangs. Her point here is that these groups, by definition, are social groups with roles and identities, and aspects

of group belonging—belonging to a group comprised of similar social relationships—are highly relevant for understanding desistance.

2.3. Social Networks and Gangs

As summarized above, social structures or networks have a role in gang leaving and disengagement but have not taken a prominent position among gang exit theorists. Social networks can be thought of as representing the intersection between individual and structural factors, in that it is social relations that tie individuals to their environments. Relationships, or connections, are a fact of social life. The individuals, or actors, influence one another and exchange resources. These relationships, and resultant resource exchanges, are crucial in determining the life trajectory of a gang member pre-gang involvement, during, and post-gang involvement. Social ties can reinforce gang identity or help nurture and solidify emerging non-criminal/non-gang identities.

As mentioned in the introduction, in the current study, we are not focused on the gang itself as a network, but instead on the personal social relations of those individuals who are gang members. This “ego” centered approach is designed to determine the influence of each network member (i.e., alter) on the respondent (McCarty 2002). Through an understanding of how individual gang members are tied to their larger social network (which extends beyond their gang friends), research can uncover the types of personal network associations that provide influence on behavior, in this case, the likelihood of remaining in or a leaving a gang, and the lifestyle associated with it. In our review of the literature, there are less than a handful of studies that have examined the ego networks of gang members using self-report methods. Fleisher’s (2002) seminal study of teenage and adult female gang members in Champaign, Illinois, found that membership in a gang was more symbolic than real, as many gang individuals had good friends across gang boundaries (i.e., with individuals from different gangs) and exchanged important resources, such as childcare. This was the first study to extensively and systematically measure the personal social relations of gang members through self-report surveys and shed insight into the broader social and cultural milieu of gang members. Surprisingly since then, the characteristics of other social relations of the gang member—or delinquent youth even—have rarely been studied using self-report measures in a network framework (Roman et al. 2016). The recent scholarship on gang members and networks, for the most part, explores very limited ego networks of gang members because the networks are defined by participation or linkage to a criminal incident or event (e.g., arrest or police stop) and/or through administrative or record data (Bouchard and Malm 2016). Administrative data typically only provide a few demographic indicators, such as age, sex, race, and residential location, greatly limiting information on network composition and social roles. For the most part, many of these incident-based studies are built on socio-centric network methods, where the focus is on patterns of the whole group or the organization delineated by the extent of the connections or ties found. Network analysis of this type in the study of gangs as social groups has proliferated, with studies analyzing the ties among gang members and ties across gangs through networks of violence and conflict. That literature, because of the stark differences in aims, is not reviewed here. (See Sierra-Arévalo and Papachristos 2017 for a review).

As stated earlier, the goal of this paper is to provide an in-depth description of the social relations of gang members and how they change (or do not change) after members report they have left their gang. More specifically, we describe the composition of the networks at baseline and changes to network composition at wave 2 associated with varying levels of gang disengagement. We aim to distinguish between gang-leavers who remain attached to their gang peers through continued interaction with them and those who say they are fully detached and no longer engage with their (ex-) gang peers. In addition to examining the stated reasons for leaving a gang, which may include reasons associated with social networks (e.g., “I made new friends”), the social network data allow us to examine the characteristics of individuals dropped from networks over time and why those network relations were dropped (Feld et al. 2007). We are particularly interested in

the presence and strength of prosocial network relations across the two different levels of disengagement for those who reported leaving their gang between waves.

3. Methods

3.1. Sample and Survey Design

The current study uses survey data from a longitudinal survey and interview project designed to obtain social network data from male and female youth and young adults between the ages of 14 and 25 who were members of street gangs. The study was known as the Connect Survey (Eidson et al. 2017). Data were collected in Philadelphia, Pennsylvania and the District of Columbia (DC). Participants were interviewed three times at least six months apart beginning in mid-2013. Although the project consisted of three waves of data collection, this paper focuses only on the first two waves. The average number of months elapsed between the wave 1 and wave 2 surveys across all respondents was 8.8 months.

Respondents were recruited for Wave 1 by street outreach workers affiliated with gang reduction programs in each city. Outreach workers, most of whom were ex-gang members, were trained to recruit gang youth who they deemed were in a street gang, as generally defined by the components of the Eurogang consensus definition (Weerman et al. 2009), or, regularly hung out with people considered to be in a street gang. There are four main elements to the Eurogang consensus definition: (a) durable: has been in existence for at least several months, (b) street-oriented: spending group time outside of locations that have adult supervision (and does not necessarily have to be on the street); (c) youth: most of the group consists of individuals in their teens and early twenties; and (d) illegal activity is part of its group identity in that behavior is deemed criminal, and not simply bothersome, but is part of the group culture. The research team had a number of conversations with the outreach workers to ascertain whether their definition of street gangs was similar to the criteria to meet the Eurogang definition. Key to the recruitment of study participants was the concept of illegal identity. In both cities, we knew from these discussions that “gang” would not be a typical term used by street groups. Wave 1 survey data revealed that the most common terms group members used for their peer group were “clique” (34%), followed by “crew” (23%). Only 19% referred to their street group as a gang. Other terms used by respondents included “organization” and “squad”. To enhance the likelihood that the youth met our street gang definition before they sat down for the survey, the research team used a screening tool to determine final sample inclusion. In addition to the age requirement, the youth had to answer in the affirmative to having a peer group that they currently hang out with and, at minimum, one of the following items: ever involved in at least some type of illegal activity (individual or group activity), have friends in a gang, or calls their peer group a “gang” or “crew”. The screening also helped identify individuals who may have been eligible but were unwilling to honestly report their behaviors on a survey—important to a study whose primary focus was examining the process of leaving a gang, thereby necessitating the identification of those in street gangs. Note that the research team did not mandate that the study participants met the official self-reported Eurogang definition of a street gang.

Respondents were invited by outreach workers to meet the research team that day or at a later date to complete a self-guided, computer-based survey. Participation in the survey was voluntary. Parental consent and youth assent were obtained from youth under 18 and individual consent was obtained from those 18 or older. Respondents were paid 50 US dollars at each survey wave.

Recruitment for the study at baseline yielded 229 individuals across the two sites who passed the screening criteria. For the second wave, we employed a variety of methods to attempt to locate survey respondents after the first wave. Each site had at least three core research team members working part-time to re-engage the sample. Efforts included meeting with the outreach workers to expand re-recruitment efforts and find out whether any individuals who took the survey had moved away, were incarcerated, or were otherwise

unable to take the survey. All research protocols were approved by the RAND Corporation human subjects review board.

The response rate for wave 2 reached just under 50% for the sample across both cities; we obtained valid survey data for 112 respondents at wave 2. For the current paper, however, we dropped one respondent who had a high level of missing data across most variables, and as a result, the paper analyzes baseline data on 228 individuals and 111 respondents at wave 2. More details on the recruitment and re-contact/follow-up strategy can be found in [Eidson et al. \(2017\)](#). That paper also includes details on the attrition analyses conducted. The analyses, conducted to determine the relative risk of being lost to follow-up given key baseline demographic characteristics, found the only significant factor to be sex (males were less likely to return) and attachment to work or school (those not attached to either institution were more likely to be lost to follow-up). In addition, there were no significant differences in attrition by site.

Survey data were collected using EgoNet software ([McCarty 2003](#)) and Qualtrics (Provo, UT). At each wave, the survey included three sections. The first section included questions about the respondent (or “ego”). Questions were asked about demographic characteristics, living arrangement and environment, work, school and leisure activities, delinquency, group characteristics and involvement, and attitudes toward gangs and gang joining. The second section, the alter section, asked about the respondent’s current social network: at each administration, respondents were asked to identify 20 individuals (or “alters”) that were important to the respondent and were at least 10 years of age. The alter elicitation text was read as follows: *Please list 20 people important to you and who are at least 10 years old. Start by thinking of the people you hang out with or might see regularly in a typical day. Then, think of the people you talk to or see the most. For example, you can name family members, friends, neighbors, or even people you don’t like.* Respondents were encouraged, but not required, to provide 20 names. In total, 87% of the sample listed 20 names, with another 7% listing between 15 and 19 names. Following the identification of network members, respondents were asked a series of questions about each alter. These questions, which capture aspects of network composition, comprise a core component of measuring and understanding personal networks ([McCarty 2002](#)). The alter question items are listed in [Table 1](#). In the third section of the survey protocol, respondents were asked about each alter’s ties to one another, which results in the information about network structure (not examined in this paper).

The wave 2 survey instrument included an additional component comprised of questions about changes in the lists of alters generated by the respondents between waves. These questions provide important information about the reasons gang members break away from their prior associates and other social relations. These questions allow us to closely examine the reasons behind changing network composition for those who reported leaving their gang and those who did not, as well as give us the opportunity to consider the disengagement process and possible network-based drivers behind crime desistance for individuals. Below we highlight key measures that will be examined in this paper.

Table 1. Connect Survey Question Items about Alters.

1. What are _____'s nicknames or other names that friends and family use to refer to _____?
2. How old is _____?
3. What grade or year is _____?
4. Is _____ male or female?
5. Can you name one thing to describe _____ so that we can tell the difference between this _____ and another _____?
6. Who is _____? (relationship)
7. Does _____ live in your neighborhood?
8. Does _____ live with you?
9. How did you meet _____?
10. Is _____ of Hispanic, Latino, or Spanish origin or descent?
11. What country was _____ born in?
12. How much time do you spend each week hanging out with _____?
13. How much do you like _____?
14. If you needed some information or advice about something, is _____ someone you could go to?
15. How likely is it that _____ carries a gun (including in his/her car)?
16. Has _____ ever sold illegal drugs such as marijuana, cocaine, or crack?
17. How likely is it that _____ has been in a gang fight over the <u>last year</u> ?
18. How likely is it that _____ is currently in a gang?
19. How likely is it that you use drugs with _____?
20. How likely is it that you drink alcohol with _____?
21. When you are with _____, what do you do most often?
22. When you are with _____, what <u>else</u> do you do most often?
23. Have you ever in your life committed a crime with _____? Please think of any crime that you know is against the law.
24. How supportive do you think _____ is of you being involved in a group of friends such as a gang or crew that participates in illegal activities such as a gang or crew? If you are not in a group like this or if _____ doesn't know you are, how supportive do you think _____ would be if s/he knew you were in this kind of group?

3.2. Measures

3.2.1. Gang Leaving and Disengagement

The Connect Survey included items to assess whether a respondent left their peer group that was a gang and whether they remained engaged with their group, even if they reported leaving. Respondents were asked about their group that was deemed a gang in wave 1 (their main peer group with whom they engage in illegal activity). At wave 2, we asked respondents to recall the group named at wave 1 (with prompts) and then we asked: *Since the last survey, have you left or quit the group that you described in the survey?* For those respondents who reported having left their wave 1 group, we asked them to describe their current "level of involvement" with that group. There were five response options ranging from "I never participate in anything the group does" to "I participate in nearly everything that the group does". Respondents who reported they never participate in anything were classified as "disengaged", and the other four response options were collapsed and classified as "remaining engaged" in the analyses that follow. It is also important to note that in the remaining narrative, we use the term "group" and "gang" interchangeably.

The wave 2 survey instrument also included a set of 16 questions asking respondents who reported leaving their gang or group why they left. The items are all binary yes/no questions and respondents were directed to choose "all that apply". The question items included I left the group because I/my . . . : (1) found new interests, (2) was bored, (3) something happened of which I wanted no part, (4) wasn't what I thought it was going to be, (5) was hurt, (6) family or friends hurt or killed, (7) got into trouble with the police, (8) went to prison, (9) was forced out, (10) got a job, (11) had/am expecting a baby, (12) parents

made me, (13) partner made me, (14) had an adult encourage me to leave, (15) made new friends, and (16) moved.

3.2.2. Other Group Characteristics

Although not used in analyses in the current study, we included a few measures on group characteristics purely for baseline description purposes. These measures included: (1) Does the group have a territory it claims as its own? (yes/no); (2) in the past six months, has your group provided protection for each other? (yes/no); and (3) in the past six months, has your group defended an area or place against other groups? (yes/no).

3.2.3. Delinquency and Crime

Delinquency and crime were measured at both the individual level and the group level. We asked individuals about their own lifetime participation in crime and recent (past six months) involvement in crime. The individual-level criminal behavior measures included are: (1) sold illegal drugs, (2) motor vehicle theft, (3) participated in a gang fight, (4) carried a weapon without a license, (5) used a weapon or force to steal or rob someone, and (6) attacked someone with a weapon to hurt or kill them. We used these items to construct two sets of binary measures across the crime types for “lifetime” and “recent” involvement. Although not used in analyses, we also included baseline demographic measures for “currently on probation or parole” (yes/no) and whether the respondent was ever arrested for a violent crime (yes/no).

With regard to group involvement in illegal activity, we created a binary measure for any recent group-based crime, which was created from seven binary survey items asking the respondent whether, in the past six months, his/her group had done any of the following: (1) been in fights with gangs/crews, (2) damaged or destroyed property, (3) stolen things, (4) stolen cars or motorcycles, (5) robbed other people, (6) sold marijuana, (7) and sold other illegal drugs.

3.2.4. Personal Network Composition

Composition: Alter Role Characteristics, Exposure to Prosocial Ties, and Exposure to Anti-Social Behavior

Characteristics of the respondent’s personal networks with regard to roles and exposure to criminal behavior were operationalized from survey question items that asked about each of the alters named. As listed in Table 1, there were a number of questions that simply asked who the alter is and the type of relationship the alter has with the respondent (how met, how long known, type of relation, age, race, sex, etc.) For the current paper, we focus on three mutually exclusive roles defined from ego-alter ties: family, peers, and mentors. We also create a measure representing tie dispersion across these three different types of ties using Blau’s index of heterogeneity (“Blau’s H”) (Blau 1977). Its computational formula is simply:

$$H = 1 - P_1^2 - P_2^2 - P_3^2 - \dots - P_r^2$$

where P_1 is the proportion of ties in relation i members in r relation category. Values can range from zero to a maximum of $1 - 1/r$ if each group has the same number of ties. In our study, we measure three types of relations, hence the values range from 0 to 0.67. If all ties are in one group, the value will be 0, versus higher values for more equal distribution across the three types of relations.

To capture network exposure (Valente 2010) to criminal behavior, we utilized the four alter questions about alters’ criminal behavior (carry gun, in a gang, co-offend with ego, sell drugs). We used ordinal response categories: “not at all likely” (0); “somewhat likely” (1); “very likely” (2); and “don’t know”. Response values 1 and 2 were recoded to “1” indicating involvement in the behavior. “Don’t know” was recoded as “not at all likely” (or a 0 value) to err on the conservative side. We also included a measure to capture the likelihood that the alter supports the respondent’s gang lifestyle.

To create summary personal network measures for these alter variables (with exception of tie dispersion), each binary variable was summed across all alters and divided by the respondent's number of alters, yielding proportional values ranging from 0.00 to 1.00. In summary, these alter compositional and ego-alter tie measures include:

- *Family in network* is the proportion of alters who were listed as a parent/guardian, sibling, cousin, aunt/uncle, or grandparents;
- *Peers in network* is the proportion of alters who were listed as a "friend";
- *Prosocial relations/ties* was defined as ties listed as coaches, teachers, counselors, and outreach workers. This variable was designated "mentorly relations" to distinguish it substantively from other possible prosocial ties (e.g., parents, older siblings, etc.);
- *Tie dispersion* across peer, family, and, mentorly relations;
- *Same household relations* is the proportion of alters who live in the respondent's household;
- *Same neighborhood relations* is the proportion of alters who live in the same neighborhood;
- *Gun carrying alters* is the proportion of alters where respondent indicated very likely or somewhat likely to carry a gun;
- *Alters in a gang* is the proportion of alters where respondent indicated very likely or somewhat likely to currently be in a gang;
- *Co-offenders* is the proportion of alters where respondent indicated "ever committed crime with". Note that the response options provided were yes/no;
- *Drug-selling alters* is the proportion of alters where respondent indicated that alter very likely or somewhat likely sells illegal drugs;
- *Supports gang lifestyle of respondent* is the proportion of all alters who were somewhat likely or very likely to support the gang lifestyle of the respondent, as reported by the respondent. (Respondents were not provided a "don't know" option).

Composition: Strength of Network Ties

Following research by [Granovetter \(1983\)](#) and other network scholars ([Mathews K. Michael et al. 1998](#); [Wellman and Wortley 1990](#)), we also included three measures representing the strength of network ties. Granovetter asserts that tie strength generally includes four properties: amount of time spent with someone; emotional intensity of the relationship, intimacy (e.g., friend vs. best friend), and whether reciprocal services are provided or the relationship itself is reciprocated. Other theorists and researchers have suggested that plausible indicators of tie strength also include emotional support or advice given and/or received. A measure of "high interaction alter" was created from the item asking about how much time is spent with the alter. Response options ranged from every day to "don't really ever see this person". A high-interaction relation was designated where the respondent stated they see the alter "every day". Alters were also designated an "advice network relation" when a respondent stated they go to that individual for advice (response options were "yes/no"). Last, a dichotomous measure for "dislikable relation" was created for each alter when a respondent, when asked: How much do you like person X? (a whole lot, some, not at all), reported they did not like an alter. This measure was included because prior research by [Fleisher \(2002\)](#) has shown that not all gang members like their gang peers and these adverse relationships may correlate to reasons for leaving a gang.

3.2.5. Changes in Social Networks

To understand a range of possible differences between the social relations elicited at each wave of the survey, at wave 2, respondents were first asked to name 20 alters, using the same questions to elicit alters as used for wave 1. Respondents were shown their wave 1 alter list only after they had finished naming alters for wave 2. Respondents were then asked to compare their wave 1 and wave 2 lists and identify the individuals that were the same at each wave, those wave 1 alters who had been dropped by wave 2, and any

individuals who were new at wave 2. If respondents had dropped alters at wave 2, we then asked individuals a series of questions about why they did not name that person.

3.2.6. Demographics

Basic demographic variables include age, sex, ethnicity (Latino = 1), marital/significant relationship status, and site (DC = 1; Philadelphia = 0). Because the sample age range was wide (14 to 25 years of age), to measure attachment to the traditional institutions of school or work, we combined two items to form a dichotomous measure as to whether the respondent was either in school or employed. If either, the variable was coded “1”. We created a variable indicating whether a respondent lived with his/her parents and/or other family members (e.g., siblings, cousins, aunts/uncles, and grandparents). We also created binary variables indicating whether the respondent had children and if so, whether they provided financial support for the children.

3.3. Analytic Strategy

In order to provide useful information about the personal relationships of those respondents who reported leaving their group and the changes specific to their networks over the elapsed time between waves 1 and 2 (roughly nine months), we first provide descriptive information on the full baseline sample and those who reported leaving their group, and then we examine any differences between those who reported leaving but still hang out with members of their group (“engaged”) versus those who left but do not associate with their old gang peers or participate in their activities (“disengaged”). We provide tables to then highlight the reported reasons for leaving their group as well as why some network members disappeared from the ego networks between waves and focus on changes across the range of network composition variables. We do this by making use of descriptive statistics (i.e., measures of frequency, central tendency, and dispersion), and where appropriate, utilize *t*-tests to determine significant differences in network compositional factors between waves. Where relevant, we examine differences between self-reported group-leavers who remain engaged with their group versus those reporting being fully disengaged. With regard to missing data, when a respondent had missing values for key measures, we dropped the respondent(s) with missing data from the particular statistical calculation and noted missing in the table. We chose not to conduct imputation given that our analyses are descriptive and we wanted to provide an accurate representation in the descriptive portrait.

Given the salience of social networks in the recent desistance literature as possible “hooks for change” (Giordano et al. 2015; Weaver 2016), we expect to see a number of network changes at wave 2 for those individuals who have completely disengaged. Specifically, we hypothesize that for those respondents who reported they left their group and no longer participate in that group’s activities, there will be more network members dropped between waves, and an increase in the proportion of network members considered prosocial (“mentorly”), as compared to those who remain engaged. For those who are fully disengaged, we also expect a reduction in network members who are peers and reductions in members who support the respondent’s “gang lifestyle”. We expect that any reduction in peers translates to an increase in network members who are parents or considered family because, in the short time between waves, it is not likely that respondents gain new friendships that have solidified enough to be easily named at wave 2. We also examine the reasons why some of our respondents’ relations were not named at wave 2 and whether the reasons differed across disengaged group-leavers versus those who remain participants in group-based activities of the group they reported leaving. Here, we expect that group-disengaged respondents will be more likely to report that they have new friends, or their “old” friends did something they did not like or did not want to be a part of, or hung out with people they do not like, than those who reported leaving their group, but still participate in things the group does.

4. Results

4.1. Baseline Characteristics

Table 2 provides demographic characteristics of respondents at baseline (i.e., wave 1) including the individual-level offending and group-based characteristics of the sample. With regard to individual-level offending, no more than half the sample reported ever engaging in the following criminal activities: sold drugs (40%), stole a motor vehicle (30%), robbery (47%), aggravated assault (“attacked someone to serious hurt/kill”—46%). Roughly one-third of the sample had been arrested for a violent crime at some time in their life, and one-third reported being on probation or parole at baseline. Nearly 70% of respondents at baseline reported that they belonged to a group that committed, in the last six months, at least one group-based illegal activity.

Table 2. Demographic Characteristics of Sample at Baseline, n = 228.

	Wave 1	N
Demographics		
Philadelphia site (versus DC)	57.89%	228
Average age	19.35	228
Male	65.07%	228
African American	64.91%	228
Hispanic/Latino(a)	19.74%	227
Married or in serious relationship	35.37%	228
Has child(ren)	31.0%	228
Of those with children, supports them	60.0%	228
Lives with parents and/or other family	83.41%	228
In school or has job	59.03%	227
Individual offending and group behavior		
Sold drugs	40.27%	226
Stole a motor vehicle	30.09%	226
Carried a gun, last 6 months	34.65%	227
Used force or weapon to rob	47.35%	226
Attacked someone to seriously hurt, kill	46.02%	226
Gang fight	58.41%	226
Arrested for robbery or aggravated assault	32.02%	227
On probation or parole	34.80%	227
Group has committed any of 7 crimes, ^a last 6 months	69.91%	225
Group claims territory	58.22%	225
Group protected each other, last 6 months	76.44%	225
Group defended an area against other groups, last 6 months	52.89%	225

Notes: ^a Group crimes include: gang fights, property damage, theft, auto theft, robbery, sold marijuana, and sold other illegal drugs.

Table 3 provides descriptive information on the composition of the respondents’ ego networks. The values aggregate the average proportion of alters in each respondent’s network with those characteristics. The table also shows frequencies for respondents reporting zero alters with the listed characteristics, as well as those reporting that all (100%) of their alters possessed that characteristic. As discussed in the measures section, these characteristics are those as described (i.e., reported on) by the ego; this study did not collect information directly from alters. On average at wave 1, respondents’ networks were majority male (0.67) and African American (0.76), reflecting the makeup of the respondents themselves. One quarter of ego networks were, on average, comprised of alters reported to be Latinx. In general, respondents reported networks that were roughly half family; similarly, networks, on average, were half peers. A sum of 27 respondents (12%) reported that none of their alters were peers. This roughly corresponds to the number of alters who reported that their entire network was comprised of family members (23 respondents). Respondents, on average, spent a lot of time with just over half of their network members (0.59) and would go to roughly the same proportion for advice (0.60). Only four respondents (roughly 2%) reported that there was no one in their network they went to for advice. On average, ego networks were comprised of very few alters who were disliked by respondents (0.11) and an even lower proportion (0.01), on average, were listed as coaches, teachers,

counselors, or outreach workers—“mentorly”. A large majority reported having no (0) mentorly alters (89%).

Table 3. Compositional Characteristics and Network Exposure at Wave 1, n = 227 ^a.

Respondents' Alters Who ...	Average Proportion ^b (S.D.)	Freq. Reporting No (0) Alters with Characteristic No. (%)	Freq. Reporting All Alters with Characteristic No. (%)
Are male	0.67 (0.26)	5 (2.20%)	32 (14.10%)
Are African American	0.76 (0.31)	12 (5.29)	67 (29.52)
Are Hispanic/Latino	0.27 (0.31)	62 (27.31)	7 (3.08%)
Are respondent's parents	0.06 (0.11)	124 (54.63)	0
Are family	0.45 (0.34)	21 (9.25)	23 (10.13)
Are peers	0.46 (0.31)	27 (11.89)	5 (2.20)
Are mentorly	0.01 (0.03)	201 (88.55)	0
Live with respondent	0.17 (0.21)	62 (27.31)	1 (0.44)
Carry a gun	0.39 (0.34)	41 (18.06)	13 (5.73)
Is in a gang	0.28 (0.30)	62 (27.31)	6 (2.64)
Commit crimes with respondent	0.27 (0.32)	76 (33.48)	8 (3.52)
Sell drugs	0.29 (0.31)	53 (23.35)	9 (3.96)
Are supportive gang lifestyle	0.62 (0.34)	18 (7.93)	44 (19.38)
You spend lots of time with	0.59 (0.28)	2 (0.90)	21 (9.42)
You go to for advice	0.60 (0.27)	4 (1.79)	17 (7.62)
You do not like	0.11 (0.17)	97 (42.73)	0
Lives in neighborhood	0.49 (0.27)	7 (3.08)	7 (3.08)
Tie dispersion ^c (family, peers, mentors)	0.29 (0.19)	-	-

Notes: ^a Alter values missing for one respondent. ^b With the exception of tie dispersion, values are central tendencies calculated as the average proportion of each characteristic across all respondents' ego networks. S.D., standard deviation. ^c Tie dispersion is the mean value across all respondents, with values ranging from 0 to 0.67.

Although the proportion of mentorly alters was low on average across networks, ego networks were not fully comprised of relations who would support a respondent's gang lifestyle. The average proportion of ego networks made up of relations who would support their gang lifestyle was 0.62, indicating that at least a third, on average, do not support the respondent's gang lifestyle. Nonetheless, on average a quarter to one-third of one's network was likely to be engaged in some type of criminal behavior (carrying an illegal gun, in a gang, committing crimes as a co-offender, or selling drugs). Eight respondents reported that their entire network was comprised of individuals they commit crimes with.

4.2. Gang Leaving and Disengagement

Turning now to wave 2, Table 4 shows that just under 30% of respondents (n = 30) self-reported leaving their group. Of those 30 who reported leaving, 13 (43%) reported that they did not participate in anything that their wave 1 group did (“disengaged”), with 17 (57%) reporting they participate in some to all of the things their group does (“engaged”).

Table 4. Gang-leaving and Disengagement at Wave 2, n = 111.

	Freq.	Percent
Self-reported left W1 group	30	27.68%
Self-reported left W1 group and never participates in anything group does	13	43.33%
Self-reported left W1 group but continues to participate in things group does	17	56.67%

Because an important substantive question among gang scholars has been whether levels of post-gang-leaving engagement signify changes in criminal activity, we first examine differences in individual-level criminal behavior between waves for gang-leavers compared to non-gang-leavers (Table 5). The statistics reported here at both waves only include those individuals who completed wave 2. The table then breaks down the gang-leavers between those who disengaged from group activities versus those who remained tied to their groups. When the disengaged versus engaged respondents are not disaggregated, looking solely at group-leavers, there are no noticeable changes in participation in criminal activity between waves 1 and 2. For those remaining in their groups (n = 80), there were a number of changes at wave 2, with more individuals selling drugs, stealing cars, carrying a gun, robbing and assaulting people in the time between wave 1 and wave 2 than in

the six months before wave 1. The lower half of the table shows a general withdrawal from criminal activity by those reporting they were fully disengaged from their groups. In contrast, across a number of crime types, those who reported leaving their groups but not disentangling themselves from group activity reported more participation at wave 2 (compared to wave 1) for all crime types.

Table 5. Changes in Offending Between Wave 1 and Wave 2, Group-Leavers and Non-Leavers.

	Group-Leavers (n = 30)		Non-Leavers (n = 80) ^a	
	Wave 1 %	Wave 2 %	Wave 1 %	Wave 2 %
Individual offending behavior, last 6 months				
Sold drugs	23.33	23.33	16.25	39.24
Stole a motor vehicle	20.00	23.33	8.75	20.25
Carried a gun, last 6 months	33.33	33.33	26.25	31.65
Used force or weapon to rob	30.00	26.67	27.50	18.99
Attacked someone to seriously hurt, kill	36.67	36.67	30.00	32.91
Gang fight	33.33	26.67	22.50	27.85
^a Missing data on one individual.				
Gang-leavers, broken down by engagement: (last 6 months)	Disengaged (n = 13)		Still engaged (n = 17)	
	Wave 1 %	Wave 2 %	Wave 1 %	Wave 2 %
Sold drugs	23.08	7.69	23.53	35.29
Stole a motor vehicle	23.08	7.69	17.65	25.29
Carried a gun	38.46	7.69	29.41	52.94
Used force or weapon to rob	30.77	7.69	35.29	41.18
Attacked someone to seriously hurt, kill	46.15	15.38	29.41	52.94
Gang fight	30.77	0	35.29	47.06

We examined further the differences between disengaged gang-leavers and engaged gang-leavers by assessing their reported reasons for leaving the group. Recall from the measures section that respondents were given a list of 16 possible reasons they could have left their group and were asked to choose all that apply. The results, shown in Table 6 highlight a number of differences between the fully disengaged group-leavers and those that remain involved. Interestingly, all reasons except “an adult encouraged me” were represented by a higher percentage of engaged group-leavers than disengaged. Engaged leavers were also more likely to choose more reasons (as opposed to fewer) for leaving than disengaged leavers.

Table 6. Reasons for Leaving^a Self-Reported Group-Leavers, Disengaged vs. Engaged.

	Does Not Participate n = 13	Remains a Participant n = 17
Push Reasons for Leaving^b		
Found new interests	53.85%	76.47%
Bored	30.77	47.06
It wasn't what I thought	30.77	52.94
Something happened I didn't like	38.46	47.06
Was hurt	7.69	41.18
Friends/family hurt	7.69	58.82
Police harassment/pressure	15.38	41.18
Went to prison/jail	15.38	41.18
Forced out by group	7.69	23.53
Pull Reasons for Leaving^b		
Got a job	23.08	64.71
Expecting a baby/had a baby	38.46	52.94
Made new friends	38.46	52.94
Moved (home or school)	7.69	35.29
Parent(s) made me	15.38	25.29
Significant other made me	23.08	52.94
Adult encouraged me to leave	46.15	29.41
Summary		
Total pushes (mean)	2.08	4.29
Total pulls (mean)	1.92	3.24
% respondents listing pushes only	7.69%	0
% respondents listing pulls only	7.69%	0

^a Reasons for leaving group are not mutually exclusive; respondents could choose all that apply. ^b Percentages in rows are based on valid responses.

4.3. Changes in Network Composition

Table 7 provides information on how ego networks changed across waves for those group-leavers who fully disengaged from their group, compared to those who remained involved. Not surprisingly, group leaving corresponded to a large percentage of alters from wave 1 being dropped by wave 2. On average, disengaged group-leavers dropped 76% of their alters, whereas engaged group-leavers dropped a bit lower percentage at 64%. However, some alters were dropped simply because respondents forgot about them or their social networks may have comprised more than 20 relations and had not yet listed that person who had been listed in wave 1 (the survey protocol capped alters at 20). After “forgot to name that person”, for disengaged gang-leavers, the next most frequent reason that an individual was dropped from a respondent’s network was “changed group of friends” (15%), and alter “moved” (12%). Notably, fewer engaged group-leavers than disengaged leavers reported they changed their group of friends (8%). Another prominent difference between disengaged and engaged gang-leavers was the percentage of alters who respondents reported they had completely severed ties with (i.e., the relationship is over): 39% for disengaged gang-leavers versus 23% for those leavers who remained engaged with their gang peers.

Table 7. Reasons Why Respondents’ Dropped Alters at Wave 2, Group-leavers, Disengaged versus Engaged, Averaged Across Ego Networks.

	Leavers, Disengaged n = 13	Leavers, Still Engaged n = 17
Avg. number of W1 alters dropped by W2	13.92	12.71
Avg. percent of W1 alters dropped by W2	75.65%	63.92%
At W2, I didn’t name that W1 person because ...^a		
... I forgot to name that person	38.02%	28.69%
... I already named 20 people	6.00	14.36
... that person did something I don’t like	4.64	4.93
... I changed my group of friends	15.07	7.88
... that person moved	12.19	11.12
... I don’t like that person	2.14	2.28
... that person hangs out with people I don’t like	7.83	2.73
... that person is an ex-boy/girlfriend	0	2.45
... we grew apart	1.56	1.88
... that person is in jail/prison	1.71	2.65
... that person is deceased	0	0
Relationship is over	39.25%	23.17%

^a Respondents could select more than one reason for dropping an alter at wave 2.

The last set of analyses utilize *t*-tests to examine significant changes in the composition of networks between the two waves. Significance tests were set up as single sample tests to examine changes to personal network composition for respondents within each category of gang-leaver over the two waves. We test the null hypothesis that change equals zero. The results of the *t*-tests (Table 8) show that for disengaged group-leavers, there are a number of significant differences pertaining to changes in network composition that occurred between waves. At wave 2, compared to wave 1, disengaged group-leavers were significantly more likely to name parents as social ties and people with mentorship roles (i.e., coaches, teachers, outreach workers, and counselors). This increase in relations designated parents and mentors by respondents was accompanied by a decrease in alters designated as peers (though this decrease was not significant) and an overall significant increase in tie dispersion across family, peer, and mentorly relations.

Table 8. Changes in Composition of Respondents' Networks between Waves.

Average Change in Proportion ^a of Respondents' Alters Who ...	Leavers, Disengaged n = 13	Leavers, Still Engaged n = 17
Are respondent's parents	0.13 *	−0.04
Are family	−0.03	−0.12
Are peers	−0.14	0.29 †
Are mentorly	0.40 ***	0.28 ***
Live with respondent	0.00	−0.01
Carry a gun	−0.20	0.05
Is in a gang	−0.31 **	0.05
Commit crimes with respondent	−0.16	0.06
Sell drugs	−0.24 *	0.03
Are supportive gang lifestyle	−0.16	0.08
You spend lots of time with	−0.09	−0.11
You go to for advice	−0.03	0.00
You do not like	−0.10	−0.02
Lives in neighborhood	−0.08	−0.09
Tie dispersion (family, peers, mentors)	0.13 *	0.33 ***

Notes: ^a With the exception of the tie dispersion measure, values are the average change between waves in the average proportion of characteristics across respondents' ego networks. *t*-tests were calculated separately for each group (as single sample *t*-tests for disengaged and engaged, respectively) testing the hypothesis that change in means between waves was equal to 0. † *p* < 0.10; * *p* < 0.05; ** *p* < 0.01; *** *p* < 0.001.

Group-disengaged respondents were less likely to name alters who were in a gang, co-offenders, sold drugs, and supported their gang lifestyle, though only *alters in a gang* and *alter sold drugs* reached statistical significance. Very notably, for those who reported leaving their group but were not disengaged, there were no decreases in the proportion of social ties with any of the compositional attributes related to criminal behavior. There was a significant increase in mentorly ties for those not fully disengaged, but this increase was not as steep as the increase for those fully disengaged from their group. Furthermore, the number of peers increased and these changes in relation types likely influenced the change in tie dispersion, with a significant mean change in the dispersion of 0.33. It is not likely that the peers added to the networks of the still-engaged gang-leavers in wave 2 were positive role models, because the change statistic for the proportion of alters supportive of gang lifestyle increased.

Overall, given the apparently reduced exposure to criminal behavior and large increase in mentorly and parental ties for the fully disengaged respondents, compared to the minimal positive changes for those who remained engaged, these results confirm our hypotheses that a complete withdrawal from interaction with old gang members is the status or state that is likely accompanied by large changes in the composition of social networks. These changes are in the prosocial direction—toward shedding anti-social ties and increasing the number or proportion of ties that can offer positive opportunities and perhaps, life-changing opportunities.

5. Limitations

Before we discuss the findings, there are study limitations to mention. First, the current study does not draw from a random sample of gang members; hence the findings are not representative of the street gang population in the United States nor of street gangs in Philadelphia or DC. Relatedly, with regard to generalizing, the findings of our study are dependent on how network ties were elicited and defined. Our study specifically and purposely asked respondents to name 20 social relations—broad and not role-based (i.e., parent, friend, relative, etc.—who are important to them. Though not all respondents named 20, the vast majority did (88%), creating a larger ego network than is typical in network studies from any social science field involving youth and young adults (with the exception of studies about *online* relations). Second, we had roughly 50% attrition at wave 2,

but we are confident, given the attrition analyses (Eidson et al. 2017) and a deeper, informal, qualitative assessment of who could not be reached for follow-up, that the attrition was not biased in a way that would affect the analyses conducted. Third, alter characteristics were operationalized through reports by the egos, not the alters themselves; some researchers have questioned the utility of these types of perceptual measures in network studies and the tendency for youth to overestimate their peers' behaviors (Baerveldt et al. 2004). However, a study examining this particular issue (Young and Weerman 2013) found that perceptions are an important factor in peer and group-based behavior and that the network approach eliciting perceptions about social ties remains a valid approach to social inquiry of peer behaviors. The authors found that overestimation of friends' deviant behavior may even be a cause of one's own deviant behavior.

Fourth, the survey techniques used in the Connect Survey do not provide information on the exact timing of when respondents de-identified as a part of the gang peer group after wave 1. Hence, we cannot establish a temporal ordering in group leaving and changes in ego networks. Future quantitative and qualitative network research on gang disengagement could collect survey data using a monthly calendaring data collection tool to help unpack disengagement and crime desistance processes and temporal ordering. Last, our study only provides a short time span (under one year) from which to examine the process of gang disengagement. We were unable to draw associations to aspects and constructs discussed in Decker et al.'s (2014) study of role transitions and the stages of gang exit (such as post-exit validation). Given that studies show youth can move back into gangs (i.e., re-identify as gang members or join another gang) after periods of disengagement, it is possible that even our study's 13 fully-disengaged former group members re-identify as group members at some future point in time.

6. Discussion

This two-site study was designed to describe the network composition of gang members and former gang members as they move through the process of disengagement and crime desistance. Even with the limitations outlined above, we view this study as a step toward advancing research on gang disengagement and desistance. Although the sample was relatively small and purposive, we were able to successfully recruit and collect a range of detailed social network data from the youth and young adults who typically are not part of the longitudinal studies cited in criminology because they are not attached to social institutions or are simply hard-to-reach through representative sampling frames.

Among the individuals who were retained at wave 2, 30 (28%) reported leaving their gang by wave 2. But not all respondents stopped participating in their wave 1 peer group's activities—of the 30 individuals who left their group, 57% continued to be involved with their wave 1 group, whereas 43% were fully disengaged. Our analyses revealed stark differences in criminal behavior and changes in network composition at wave 2 by engagement level. Furthermore, these differences between groups *by level of engagement* were much greater than differences assessed by gang membership status. This finding clearly reemphasizes the growing agreement that leaving the gang is an important process to be studied and that, not surprisingly, crime desistance is more clearly tied to full disengagement than de-identification as a member of a gang. This aligns with the markers of identity change highlighted by Paternoster and Bushway (2009): (a) crystallization of discontent, (b) changes in institutional/social relationships, and (c) a "break from the past" in that the fully disengaged gang-leavers in our study clearly made a break from the past, and this break was associated with significant shifts in social relationships.

These findings have implications for theorizing about crime desistance. As discussed in the background literature section of this paper, the role of social relations in desistance theories is largely relegated to a minor facet in theories or subsumed under the larger umbrella of social structure. Studies testing Weaver's ideas incorporating relational sociology (2016) could open avenues to more deeply examining how various ties and tie structure engender changes in identity in relation to gang and crime desistance. The work of Warr

(1996) on peers and changes in peer relationships is also relevant here. He found that when holding peer influence constant, the effect of age on crime and desistance for the most part disappeared. This finding emphasizes relationships and suggests that decreasing exposure to delinquent peers is important for reducing crime. Related to the current study, changes in peer relationships may occur due to the increasing salience of adult role models in the lives of youth—possibly those adults who encourage offenders and former offenders to leave a life of crime, and in our case *leave the gang*. This line of research, focused more squarely on personal social relations, may be integral to understanding the criminal trajectories of gang members. Indeed, a social network approach specifically capitalizes on the fact that each network member does not contribute equally to the respondent's behavior.

With regard to the various roles of social relations, significant others may have less influence than other prosocial-oriented adults (Table 6), as the influence of significant others was provided as a reason for leaving a gang by those who remained engaged after leaving, but not nearly as often by those who had fully disengaged. Additionally and notably, those who were fully disengaged provided fewer reasons for leaving—this is telling for the relative importance of adult encouragement for those who fully disengaged from their wave 1 group. It may be, for our sample, recruited by street outreach workers who are actively working to mentor youth and young adults and reduce youth engagement in violence, that the large significant increase in the proportion of mentorly alters at wave 2 for those disengaged (Table 8) can be attributed to the work of those outreach workers. These mentorly alters could be the adults who encouraged the respondents to leave their group.

Not surprisingly, these findings related to increases in mentorly network ties imply that programs that use street outreach workers, such as the Cure Violence Public Health Model, may be effective strategies to reduce violence and turn high-risk individuals and gang members onto prosocial paths. Cure Violence, which originated in Chicago, is a public health-based gun violence reduction strategy that seeks to reduce community-levels of gun violence through direct work with individuals (Butts et al. 2015). The model does not focus on gang members per se, but the eligibility criteria focus on high-risk individuals who have been involved in violence and the criminal justice system likely includes a large number of street gang members. Butts and colleagues' review of the evaluation research on Cure Violence indicates that the model has been effective, for the most part, when implemented with fidelity. Evaluation studies published since their review also show success (see for example, Roman et al. 2018). The current study also has policy implications that would support the importance of programs that buoy family structures, specifically strengthening the relationship between youth and their parents/caregivers.

In conclusion, future gang studies should include longitudinal, broad survey methods that incorporate ego-network data collection with qualitative interviews and other survey methods and techniques that will help inform the temporal ordering of gang de-identification, disengagement, and crime desistance alongside changes in both network composition and structure. Although an expensive endeavor, longitudinal surveys that enable a comprehensive set of data on a range of social ties would provide unlimited opportunities to examine a host of potentially significant factors associated with gang disengagement and crime desistance. Furthermore, an assessment of the structural aspects of ego networks—such as density, number of components, centralization—factors not examined in this study, would potentially advance theoretical work and provide additional insight for gang intervention and violence reduction.

7. Materials and Methods

Survey protocols are available by request from the first author.

Author Contributions: Conceptualization, funding acquisition, and project administration: C.G.R. and M.C.; methodology, C.G.R. and M.C.; data cleaning and validation, M.C. and C.G.R.; final analyses for tables, C.G.R.; writing: original draft preparation, C.G.R., M.C., and L.R.M. (literature

review); writing: review and editing, M.C., C.G.R., and L.R.M. All authors have read and agreed to the published version of the manuscript.

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