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Gang Organization and Gang Identity: An Investigation of Enduring Gang Membership

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Abstract

Objectives Motivated by recent advances in the study of disengagement from street gangs, this research develops a theoretical framework of enduring gang membership based on gang organization and gang identity. Using multivariate data, this research tests the theoretical framework against a competing theory derived from the general theory of crime where gang organization and gang identity are non-existent or unimportant in producing enduring gang membership.

Methods Eight waves of panel data on high-risk youth from the Denver Youth Survey and discrete-time event-history models are used to investigate enduring gang membership.

Results The length of time an individual spends in a gang is associated with the perceived organization of the gang and an individual's gang identity. In a hazard model, accounting for right censoring, low self-control, and contextual time-varying gang related variables, increases in gang identity were associated with (on average) a 26% lower rate of reporting no longer being a gang member. Increases in perceived gang organization were associated with (on average) a 12% lower rate of reporting no longer being a gang member. Surprisingly however, no association was found between gang organization and gang identity.

Conclusions This research finds support for using a theoretical framework based on gang organization and gang identity to understand enduring gang membership. Both gang identity and gang organization exert independent effects on the length of time an individual spends in a gang.

Keywords Gangs · Disengagement from gangs · Enduring gang membership · Gang organization · Gang identity

Introduction

Contemporary research on street gangs has explored the structures of gangs, the characteristics of individual members, and the activities of gangs. For example, gang researchers have explored the role of gang members' individual characteristics—such as self-control,

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previous offending, and peer relationships—on gang participation, violence, and victimization (e.g., Esbensen and Huizinga 1993; Gordon et al. 2004; Melde and Esbensen 2011; Peterson et al. 2004; Thornberry 2003). Recent studies of street gangs have examined not only the process of entering gangs but also processes associated with exiting gangs. Drawing parallels with the literature on desistance from crime, these studies examine desistance or disengagement from gangs.[1] This is an important question because, just as studies of criminal desistance suggest points of intervention to increase the likelihood that criminals desist, studies of disengagement from gangs may offer insights into processes amenable to change to push or pull members away from gangs.

Thus far, qualitative research on disengagement from gangs has found that exploitation, level of membership, maturing out of the gang lifestyle, changes in family life, influences of a significant other, and growing weary of violence all influence whether an individual remains in a gang (Decker and Lauritsen 2002; Horowitz 1983; Padilla 1992; Thrasher 1927; Vigil 1988). Quantitative research has also shown that disengagement from gangs is associated with weakened gang ties, growing weary of gang life and violence, embeddedness, marriage, and changes in family life affect disengagement (Pyrooz and Decker 2011; Pyrooz et al. 2012a, b, 2014; 2017). These causes of disengagement have sometimes been categorized as either "push" factors (those internal influences that quicken leaving the gang, such as fear of violence), or "pull" factors (influences external to the gang that can operate as hooks for change) (for a review, see Carson and Vecchio 2015). Less research has examined what features of gangs, such as organization, and what characteristics of members, such as gang identity, serve to produce enduring membership in a street gang. This is a significant issue given that current gang members commit more crimes than former gang members (Melde and Esbensen 2013; Sweeten et al. 2013).

In contrast to this body of research by gang scholars, one of the most prominent theoretical perspectives in criminology—Gottfredson and Hirschi's (1990, pp. 206–210) general theory of crime—rejects the idea that street gangs motivate members to commit crimes and repudiates the concept of organization among criminals as misguided and theoretically bankrupt. For Gottfredson and Hirschi, what is important for criminality is not gang membership, but rather low self-control, a stable individual trait that develops in childhood. Criminals are low on self-control and unable to form stable organizations.

Historically, self-control theory has received much attention in research on the causes of delinquency, and to a lesser extent, research on gang members. With a few notable exceptions, little is known about the relationship between self-control and the length of time an individual spends in a gang. An exception is research by Pyrooz et al. (2012a, b), which found that individuals with lower self-control remained in the gang longer. The authors suggest this leads to an important question: "To what extent do Gottfredson and Hirschi's (1990) hypotheses extend to the context of gangs?" (Pyrooz et al. 2012a, b, p. 20).

This paper develops a theory of enduring gang membership based on gang organization and gang identity and tests it using multivariate models of longitudinal data from the Denver Youth Survey. We contrast this framework to an alternative, based on self-control theory, in which self-control drives the length of time an individual remains in gangs,

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[1] In the gang literature, some researchers use the term, "desistance from gangs" to describe the process of leaving gangs. To avoid confusion, and following previous research (e.g., Sweeten et al. 2013) we use the term "disengagement from gangs" to refer to the process of leaving gangs, and reserve the term, "desistance," to refer to desistance from criminal activity.

which renders gang organization and gang identity either non-existent or unimportant in understanding the duration of gang membership.

Theoretical Framework

In this section, we present our theoretical framework, focusing on gang organization and gang identity. We begin by emphasizing that our framework is consistent with a group process perspective on gangs. We then briefly discuss concepts from organizational theory and social identity theory and apply them to gangs. Finally, we contrast this approach with an important competing perspective on gangs from Gottfredson and Hirschi (1990).

Group Process, Gang Organization, and Gang Identity

Our theoretical framework is consistent with a group process perspective that has produced important research findings on gangs. Pioneered by Short and Strodtbeck's (1965) classic mixed-methods study of Chicago gangs, the group process perspective was developed to address limitations of theories of structural opportunities (e.g., Cloward and Ohlin 1960). Short and Strodtbeck (1965) found that situational social interactions involving groups of gang members were crucial in explaining gang outcomes. Papachristos et al. (2013, p. 420) defined group process succinctly as "a range of interactional mechanisms and normative processes fostered by the coming together of members and the formation of collective identity" and linked social networks to group processes including intergroup conflict, reciprocity, and group status seeking (see also Maxson and Esbensen 2012). Hughes and Short (2005) found that status concerns and situational constraints (e.g., close relationship between disputant and audience intervention) were important in the unfolding of disputes among gang members. Using network data, Hughes (2013, p. 795) found "a link between prestigious positions within the structure of gang friendship networks and conformity to group processes."

Although we focus on gang organization and gang identity and do not explicitly model group processes, we take a social process perspective in which both are time-varying components of an ongoing process. For example, initiation rights are an element of gang organization, but are enacted through group processes. Similarly, the role of a gang leader, a crucial feature of gang organization, is enacted through a variety of group processes in which leaders exercise authority over other members. The same can be said of gang identity: identities are constructed and made salient through a range of group processes that include initiation rites, retaliatory acts of violence, patrolling turf, and the like. In short, in the absence of group processes, gang organization and gang identity would not exist.

From a social process perspective, what is critical for understanding the length of time spent in a gang is the gang member's subjective perception of the organizational features of a gang. That is, if a gang is organized but the members do not realize it, gang organization will have minimal effect on retention in the gang. In the words of Thomas and Thomas (1928, p. 572), "If men define situations as real, they are real in their consequences." Specifically, we take a pragmatist view, consistent with Mead (1934) and Dewey (1922), arguing that there is an objective reality of gang organization and gang identity, but that reality is indefinite, and precisely how that reality is characterized depends on the problematic situation at hand (Matsueda 2006).

Organization and Rationality

Ethnographic research suggests that gang organization is relatively rudimentary, approximating informal group structures, rather than large bureaucratic structures (e.g., Thrasher 1927; Klein 1971; Decker and Van Winkle 1996; Miller 2001). Nevertheless, it is useful to draw on organizational theory to identify dimensions of informal organization. Broadly speaking, organization refers to structures that promote formal rationality by increasing the efficiency of attaining organizational goals and reducing the uncertainty of organizational activities (e.g., Weber 1922). Rationality is increased by a division of labor into specialized roles and tasks—including leadership—by development of organizational rules, informal norms, and sanctions, and by instituting regular activities. Such structures make organizational activities internally efficient, rational, and predictable. Thus, gangs develop organizational structures instrumentally to increase the efficiency of attaining shared goals.

According to the institutional perspective in the sociology of organizations (e.g., DiMaggio and Powell 1983; Meyer and Rowan 1977), organizational structures also develop through interaction with an institutional environment. Innovative structures that improve efficiency (such as the creation of small work groups in a firm) tend to become institutionalized and viewed as legitimate in the immediate institutional environment (such as the firm's industry) (e.g., DiMaggio and Powell 1983). Such innovations may achieve such a high level of legitimacy in an environment that other organizations feel pressure to adopt similar structures to maintain their legitimacy—a process termed "institutional isomorphism" (DiMaggio and Powell 1983). For gangs, a prominent feature of their institutional environment consists of the wider community of rival gangs. When rival gangs adopt strong norms of retaliating against gangs who have disrespected a member, a given gang will feel pressure to adopt similar norms, not only to reduce the likelihood of being disrespected in the future, but also to maintain status and legitimacy on the street. At times, pressure to adopt legitimizing structures may be felt even when efficiency is no longer increased. For example, gangs might adopt initiation rites even after the rites no longer serve a manifest function. The rites may become what Meyer and Rowan (1977) termed, "institutional myths," imbued with ceremonial ritual and symbolism that serves the latent function of legitimizing the gang on the street and thereby ensuring survival.

Groups that are more organized, rational, and legitimate, are more likely to attain group and personal goals efficiently and create a sense of justice and legitimacy (Hogg and Terry 2000; Mael and Ashforth 1992). In turn, such groups will be defined as more prestigious, induce stronger commitment to the group, and inculcate stronger group identity. Criminological research on group identity has historically drawn on symbolic interactionist theories to specify how delinquent, criminal, and gang identities form and motivate behavior (e.g., Becker 1963; Matsueda 1992; Vigil 1996; Giordano et al. 2002). Such research finds that identities are rooted in the groups in which individuals participate. We follow this tradition, but also draw explicitly on social identity theory as developed by Tajfel (1978) and apply it to gangs.

Organizational Features and Goals of Gangs

Any examination of gang organization is dependent on how the features of organization are defined. The classic description of gang organization, made by Thrasher (1927), remains useful today. The key elements of organization within gangs mirror those of society's other

institutions and include the presence of leadership; regular face-to-face meetings; differentiated roles and coordinated activities; rules, codes, and norms with sanctions for violators; and initiation rites of passage (Bouchard and Spindler 2010; Miller 2001; Decker and Curry 2000; Decker and Van Winkle 1994; Thrasher 1927). Although Jankowski (1991) discusses gangs with elaborate multi-level hierarchical authority structures, we see such structures as the rare exception rather than the rule. Following Weber (1922), we conceptualize organization as an ideal type that is purposive and rational, with rule-governed decision making, impersonal positions with defined responsibilities, and hierarchical structures of authority (e.g., Cressey 1972).

Defining organization in terms of purposive behavior requires that we identify the principal purposes, objectives, and goals of the gang. Such goals are typically implicit, understood, and taken-for-granted. They can be inferred from the activities of gang members and are most starkly revealed when attempts to obtain the objectives fail, leading to frustration, anger, and remedial action. We identify five major interrelated objectives or goals of gangs.

Perhaps the most important objective is maintaining respect, status, and legitimacy of the gang within its organizational environment—the streets. A strong reputation on the street is essential to reduce the likelihood of being exploited or punked by other street gangs, whether through acts of violence on members, encroachment on neighborhood turf, or squeezing in on a drug dealing network. Relatedly, preserving the street status of individual members is a second objective. Status of the gang and an individual member are strongly related: disrespecting an individual gang member—e.g., through public acts of intimidation or violence—brings dishonor to the gang as a whole.

A third objective is controlling turf. Most gangs develop from local ties to the neighborhood, identify the neighborhood as "their" turf, and view encroachments by other gangs as signs of disrespect. In their interviews with gang members, Decker and Van Winkle (1996) found near consensus in the importance of protecting one's turf for a combination of symbolic and objective reasons (e.g., "we live here" or "this is our drug market turf").

A fourth objective of gangs is to maintain a sense of camaraderie, belonging, and family. Vigil (1988) found members often join gangs for social support and a sense of belonging in which the gang serves as a surrogate family that protects members from harm and disrespect. A final objective is drug selling and other pecuniary crimes, which characterize some gangs but not others. Decker and Van Winkle (1994) found that 12% of gangs in their St. Louis sample were involved in drug selling and a number of members committed other monetary crimes as part of the gang.

Social Organization of Street Gangs

We argue that at least six features of gang organization—leadership, roles, rules, symbols and colors, meetings, and initiation rites—generally facilitate attaining gang objectives, including maintaining respect, controlling turf, providing protection and support, and selling drugs (see Fagan 1989). First, organized gangs are likely to have leaders, which creates a rudimentary hierarchical structure in which authority is greater at higher levels. Leaders often emerge naturally based on outstanding qualities or skills relevant to the gang's activities, including age, experience, physical prowess and fighting ability, ability to make quick and firm decisions, and ability to persuade others to follow (e.g., Thrasher 1927; Decker and Van Winkle 1996). Decker and Van Winkle (1996) argue that leadership tends to be situational and informal—that is, de facto rather than de jure—as leaders emerge naturally and guide gang activities, rather than dictating specific acts.

Second, more organized gangs have a division of labor or some rudimentary specialization of tasks into impersonal roles beyond the leader. Some roles emerge from personality types, such as "show off," "loco," "brains," and "joker." Others emerge from focal activities, such as dealing drugs, fighting other gangs, or engaging in robbery and other crimes. Still others evolve from functional necessity: a treasurer to handle finances, an enforcer to dole out punishment to members caught violating rules, and a lookout to watch for signs of law enforcement. Specific roles increase the efficiency of gang activities, reduce uncertainty, and increase the likelihood of succeeding in objectives, all of which promote identification with the gang. In addition, commitment to a specific role, such as core versus peripheral member, will increase the salience of one's identity with the gang as a whole.

A third dimension of gang organization is a set of gang rules, norms, and codes, with definite sanctions for violators (Thrasher 1927; Fagan 1989). These rules are typically not codified or written down, but rather are informal understandings evolving out of practice or lore and can include things like not running from fights and never informing on members of the gang (Decker and Van Winkle 1996). Sanctions typically involve assault by an enforcer and sometimes by multiple gang members. The enforcement of rules increases discipline within the gang, reduces uncertainty, and helps ensure the legitimacy and status of the gang on the streets.

A fourth feature of gang organization is regular meetings, which can range from recurrent informal gatherings to formal meeting times designated by a leader. Meetings help build solidarity, help disseminate information, and help increase the certainty of gang activities. A fifth dimension of gang organization involves gang colors and symbols. Wearing gang clothes, displaying hand signs, and showing gang tattoos is a way of trying out a gang identity and becoming enculturated into the gang (Decker and Van Winkle 1996). Moreover, such displays overcome asymmetries of information: A Latin King on the street knows he is a King, but without the display of symbols or colors, members of rival gangs lack this knowledge. Once this information is known by all parties, gang members can communicate threats, show disrespect, and intimidate rival gang members in a meaningful way. Furthermore, when other gangs in a community use hand signs, wear colors, and display tattoos to distinguish themselves from other gangs and thereby increase the legitimacy of the gang and strengthen members' gang identities, other gangs feel pressure to adopt similar signs, creating institutional isomorphism.

A sixth element of gang organization is the presence of rites of initiation. Gang initiation rites typically entail a public physical beating of the initiate by other gang members. This rite of passage is imbued with important symbolic meanings (Vigil 1996, pp. 151–152). Onlookers observe gang members administering the beating, as well as observing the bruises and cuts— "a badge of honor"—left on the initiate. The two symbols establish the initiate as a "homeboy," marks a passage to manhood ("un hombre con huevos"), and marks a readiness to engage in gang banging, including fights, raids, and retaliation. Durkheim (1964), rites of initiation help define moral boundaries of the gang and increase gang solidarity (see also Bloch and Niederhoffer 1958).

We argue that objective gang organization is a rational feature of gangs that facilitates purposive behavior, including engaging in gang violence, illegal rackets, or other gang activities, making those activities more efficient and less risky. Leadership and coordinated roles increase efficiency, gang codes increase informal control, and initiation rites increase in-group boundaries and solidarity. Such features of objective gang organization increase the legitimacy of the gang on the street, contribute to stability in gangs, and produces enduring membership.

As noted earlier, we follow the Pragmatism of Mead, Dewey, and Thomas, and argue that the critical variable is not objective gang organization, but rather subjective organization as perceived by the gang member. If gangs are organized, but a member does not perceive that organization, that organization will have weak effects on the member's attitudes and behaviors. We assume that subjective perceptions of gang organization are, to some extent, rooted in reality—that is, in the objective organization of the gang—but we do not assume a perfect correspondence. It follows that perceived gang organization should produce stability in gangs and, more importantly for our purposes, produce enduring membership in a gang. Thus, our principal hypothesis is that perceived gang organization increases the length of time members remain in the gang.

Gang Identity

Drawing on social identity theory, we examine one possible mechanism by which gang organization may produce enduring membership in the gang—the development and maintenance of a gang identity within individual members. Tajfel (1978, p. 63) defines social or group identity as "the part of an individual's self-concept that derives from his knowledge of his membership of a social group (or groups) together with the value and emotional significance attached to that membership." A strong gang identity supplies a member with a sense of self-worth. Thus, gangs that provide a sense of respect, importance, and belonging will inculcate strong identification with the gang. A strong gang identity also creates an affective commitment to the group, resulting in the member valuing the gang and its activities. Moreover, the gang serves as a reference group, or in Mead's (1934) terms, "a generalized other," guiding behavior according to the gang's norms and expectations. Identities are not always activated, but rather are made salient by social context.

Social identity theory specifies how group processes create and maintain identities. Gang identities are likely to be activated in the presence of other gang members (or rival gangs) in a process of depersonalization: the member sees him or herself as the prototypical group member and behaves accordingly (Turner et al. 1987). Given the rules and expectations of the gang, those with strong gang identities are likely to engage in gang activities, including engaging in retaliatory acts of violence after a member is victimized or threatened (e.g., Papachristos 2009).

Tajfel and Turner (1979) hypothesize that self-identity arises through a series of in- and out-group comparisons that helps link identity to group process and gang organization. Specifically, group identities are formed in three steps. First, through social identification, individuals come to perceive themselves as members of an in-group and develop a sense of belonging. As noted above, a prominent reason members join gangs is for social support and a sense of belonging. Second, through social categorization, individuals distinguish this in-group from out-groups, which are groups to which they could, but do not, belong. Gang members, on average, are cut off structurally from conventional sources of success, such as education and high-status careers, and therefore, their viable groups are often circumscribed to members of other gangs and those drawn from the ranks of the marginally employed in low-status secondary sector jobs. Third, through social comparisons, individuals evaluate their in-group to out-groups. If they find their in-group to be superior, the group will become a source of pride and self-esteem (Tajfel 1978; Tajfel and Turner 1979). Conversely, if individuals evaluate an out-group as superior to the in-group, they will work either to improve the in-group or, if that is not possible, seek membership in the

out-group. In these ways, gang identity emerges out of group processes involving in-groups and out-groups.

But what criteria do individuals use in evaluating in-groups versus out-groups? For members of gangs, we conceive of three major criteria for evaluating a gang relative to out-groups. The first is the degree to which the gang satisfies the immediate needs of members. These needs include respect and status on the street; a sense of camaraderie, belonging, and family; and a feeling of safety in the neighborhood. A second criterion is the prestige of the group, which social identity theory hypothesizes will increase group identity (Tajfel and Turner 1979). The third criterion is minimization of uncertainty. Hogg and Abrams (1993) argue that most individuals seek to reduce uncertainty in their social world, and therefore, groups and organizations that reduce uncertainty will induce greater group identification in their members.

We argue that a strong gang identity—as perceived by the gang member—will motivate a member to be engrossed in gang activities, such as violence and drug dealing, and will increase the length of time he or she is a gang member.[2] Moreover, we argue that, on average, gangs with more elaborate organizational features will be more efficient in meeting the average needs of members, will minimize uncertainty for members, and will be perceived as more legitimate and prestigious by members. In turn, such groups will induce stronger identification in members, who will engage in more gang-related activities and remain in the gang for longer periods of time. Conversely, weakly organized gangs will be less efficient, more uncertain, and be perceived as less legitimate and prestigious by members, who will identify less with the gang, participate in fewer gang activities, and leave the gang sooner. Activities required by organized gangs (abiding by rules, going to meetings, paying dues, identifying with certain signs and colors) facilitate stronger gang commitment and identity. Therefore, when gang members use gang signs, engage in retaliatory acts of violence against rival gangs, and follow gang codes, they are not only increasing their "street cred" in relation to other gangs, but also strengthening their own gang identities. Moreover, the converse is true as well: strong gang identities will increase gang cohesion and cooperation, and thereby facilitate greater organization in the gang.

General Theory of Crime: Spuriousness Due to Low Self-Control

In contrast to our theoretical framework of gang organization, gang identity, and enduring gang membership, Gottfredson and Hirschi (1990, p. 202) argue that neither organization nor identity are important causes of crime. Instead, gang organization, as described by Thrasher (1927) and others—consisting of goal-directed behavior, internal stratification into roles, commitment to the group, and stability of roles beyond the particular occupants—is a false depiction maintained by mass media, law enforcement, and social scientists plying their trade in places where organizational tools are inappropriate. Specifically, Gottfredson and Hirschi (1990, pp. 207–209) assert the following: gang members are often incapable of naming leaders; members refuse leadership roles when offered; gang

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[2] Our data allow us to test the primary hypothesis that reductions in gang identity are associated with an increased probability of leaving a gang. We are unable—because of data limitations—to test a secondary hypothesis that the reductions of gang identities are caused by concomitant increases in conventional role-identities, and thus, may operate directly or indirectly through gang identities. This secondary hypothesis is supported by studies of delinquency, such as Giordano et al. (2002) study of conventional role-identities as "hooks for change" producing desistance from crime.

membership varies day-to-day; rules of attendance fail to apply; and members lack the requisite social skills, trust, and mutual interests to sustain social interaction and attachments to the gang.

Some studies of gangs yield findings that can be interpreted as consistent with this position. For example, Yablonsky (1967, p. 3) found that, in contrast to delinquent and social gangs, the violent gangs he studied were disorganized groups that emerged spontaneously around a small collection of disturbed psychopaths who were "not willing or able to establish a concrete relationship." These individuals participated in gangs not out of a sense of belonging, but rather as an outlet for their aggressive tendencies. Similarly, Taylor (1990, p. 4) identified scavenger gangs in Detroit that had "no common bond beyond their impulsive behavior and their need to belong." Gottfredson and Hirschi (1990) claim that such findings are universal—the rule rather than the exception. By contrast, most gang scholars argue that gang organization is an important concept that varies over space and time.

Studies that test the relationship between self-control and gangs have, for the most part, compared the levels of self-control of gang members to non-gang members, and found gang members to have lower levels of self-control (Esbensen and Weerman 2006; Hope 2003). In addition, low self-control has been found to predict how central one is to the gang's activities (Lynskey et al. 2000). Taken together, these studies generally support the hypothesis that gang involved youth have less self-control than those not in gangs. Pyrooz et al. (2012a, b) examined low self-control and a binary outcome of gang disengagement and found those with lower self-control remained in the gang longer. We will examine these competing perspectives using hazard models of the time one remains in a gang.

Conceptual Model and Hypotheses

Our theoretical framework posits that individuals' perceptions of gang organization and sense of gang identity positively relate to enduring membership in a street gang after accounting for self-control. In this section, we describe the links in the theoretical framework, represented by our statistical model, identify key testable hypotheses, and summarize previous empirical evidence for the hypotheses. Our conceptual model is depicted in Fig. 1. Our outcome variable, enduring membership, is the rate (or hazard) of leaving the gang at time t.[3] Our primary interest is in the characteristics of gangs and individuals that affect the rate of leaving a gang. In other words, what do gangs (and individuals) do to keep members in the gang for longer periods of time?

The model begins with a vector of exogenous control variables known to be related to crime, including age, race-ethnicity, parental education, prior offending, and prior victimization. We then add three measures of self-control measured at time $t - 1$, which test the hypothesis, derived from the general theory of crime, that length of time spent in gangs is driven–at least in part–by individuals' self-control.

Our framework of enduring gang membership centers on two focal variables measured at time $t - 1$—perceived gang organization and gang identity (see Fig. 1). We allow each to be a function of demographic variables and self-control via selection processes: specific gangs may select individuals with certain characteristics, or those individuals may

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[3] We use the hazard of leaving the gang to measure enduring gang membership, and note that they are statistically equivalent: If p is the probability of leaving the gang, $1 - p$ is the probability of remaining in the gang.
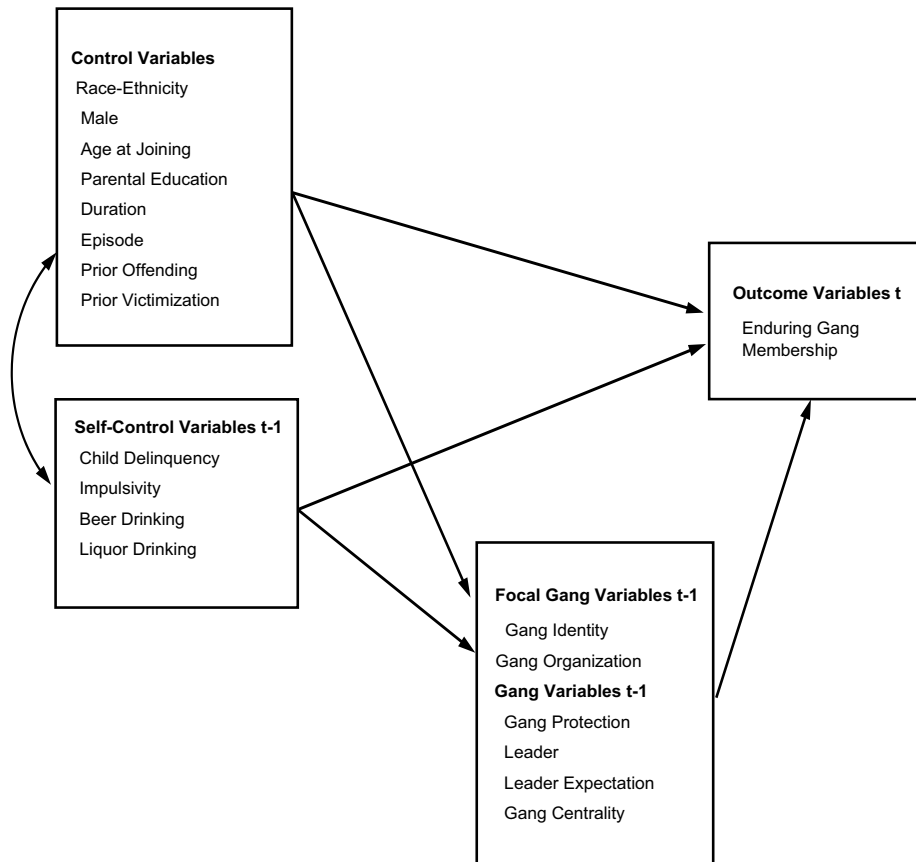
Fig. 1 Conceptual model of gang organization, gang identity, and enduring gang membership

self-select into certain gangs. We assume that gang members are, to some extent, engaging in purposive behavior when deciding whether to remain in the gang. If they believe that the gang has leadership, rules, and roles, they are more likely to view the gang as legitimate, and therefore be more likely to remain a member of the gang. In sum, we expect the following:

Hypothesis 1 Controlling for demographics and self-control, perceived gang organization will be positively associated with the length of time an individual remains in a gang.

Results from prior research on this hypothesis have been mixed. In a bivariate analysis, Pyrooz and Decker (2011, p. 421) found no relationship between length of time out of the gang and gang organization and concluded that "this means that more organized gangs are no more likely to produce long-lasting allegiance to the gang than are less organized gangs." Pyrooz et al. (2012a, b), using longitudinal data, found no effect of a static measure of the baseline level of gang organization on the length of time in the gang. However, Melde et al. (2012) found that greater levels of gang organization increase the probability of an individual becoming a stable (2 years or longer) gang member. In addition, Pyrooz

et al. (2012a, b) call into question whether organizational features of gangs form a unidimensional construct and suggest instead that certain organizational features may be more important predictors of offending than others. We examine the dimensionality of gang organization and reassess its relationship to the length of time an individual remains in a gang.

As noted above, social identity theory predicts that perceived gang organization and gang identity are positively correlated as organized gangs are more likely to inculcate strong gang identities:

Hypothesis 2 Controlling for demographics and self-control, perceptions of gang organization and gang identity will be positively associated.

Foundational principles of social identity—such as processes of categorization (which increase normative violent and criminal behaviors of gang members) and social comparisons (which can bring about fighting over status with members of other gangs)—affect the amount of offending conducted by members (Goldman et al. 2014; Wood 2014). While scholars have recently debated the merits of using social identity theory in research on gang behaviors (Goldman et al. 2014; Woo et al. 2015; Wood 2014), only Hennigan and Spanovic (2012) offered an empirical test. In that study, the strength of social identity of gang members was positively associated with criminal and violent offending.

We hypothesize that strong gang identities will increase the length of time members remain in the gang. Leaving a gang does not involve, as was once thought, shooting someone or killing one's own mother (Decker and Lauritsen 2002; Pyrooz and Decker 2011); rather, a member can often just walk away from a gang if it fails to meet his or her needs—for example, as a source of identity. Thus, when gang identity weakens, the probability of leaving the gang increases:

Hypothesis 3 Controlling demographics and self-control, gang identity will be positively associated with the length of time an individual remains in a gang.

Our model also controls for several time-varying characteristics of gangs and gang members that may be associated with crime and enduring gang membership (e.g., Pyrooz et al. 2012a, b) (see Fig. 1). Because respondents with high gang aspirations are expected to stay in the gang longer, we included controls for whether individuals reported being or expecting to be the leader of a gang. In addition, individuals join gangs for reasons relating to protection (Decker and Van Winkle 1996; Esbensen et al. 1999; Thornberry 2003) so a third variable measured whether the respondent feels the gang provides protection. Finally, we include a variable representing how far the respondent is from the center of gang activities.[4]

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[4] Our hazard models estimate the key substantive parameters regressing the hazard of leaving a gang on demographic, self-control, and gang variables. We do not present estimates of parameters predicting gang variables, as they do not alter our substantive conclusions.

Data, Methods, and Models

Data Source: Denver Youth Survey

To test our hypotheses, we use data from the Denver Youth Survey (DYS), a longitudinal study of delinquency and drug use in high-risk neighborhoods in Denver, CO from 1987 to 1999 (Huizinga 1987-1999). Viewed in historical perspective, Denver experienced a strong escalation of gang activity during this period. In the early 1980s, gangs existed in Denver, but garnered little attention, perhaps due to strong informal community organizations such as Crusade for Justice (Vigil 1999). Beginning in the mid-1980s, with the demise of community organizations, versions of the Crips and the Bloods developed in Denver, resulting in a splintering of gangs, increasing conflict among gangs, and a general proliferation of the gang problem. Gang activity brought about the "summer of violence" of 1993 and, later, the 2007 murder of Denver Broncos player, Darrant Williams by a member of the Tre Tre Crips (Durán 2013). In response, law enforcement created specialized gang units, including the Metro Gang Task Force, the Gang Bureau, and the District Attorney Gang Unit (Durán 2013).

This historical period has two implications for our analyses. First, the DYS study covered the years in which gangs developed and proliferated in Denver, implying a period of dynamic changes and growth of gangs. Given that we are modeling dynamic changes in gangs, this may be an advantage for our analysis—dynamic modeling is not feasible under stability or equilibrium. Second, our results should not be generalized to other historical periods in which gangs are neither developing nor proliferating. For example, in recent years in which gangs in Denver have stabilized and become institutionalized, our dynamic models might not hold.

The DYS sample is representative of neighborhoods at high risk of delinquency, where high risk is defined as residing in socially disorganized, high-crime neighborhoods. Using vacancy and completion rates, the original investigators selected 20,300 of 48,000 enumerated households, drew a stratified probability sample of households proportional to population size, and then used a screening questionnaire to identify respondents aged 7–8, 9–10, 11–12, 13–14, or 15–16 years old (Esbensen and Huizinga 1990, 1993). This yielded a total of 1528 completed interviews in the first wave, constituting a completion rate of 85% of eligible youths. Ten waves of data were administered essentially annually beginning in 1987 and ending in 1998.[5]

We use data for respondents who were 11 years of age and older, and who were each surveyed about gang activity. The total number of respondents reporting gang membership is 226 persons representing 404 person-years. We begin our analysis with wave 3, when survey questions about gang organization, which are central to our model, were introduced. This, in conjunction with the use of lagged $(t-1)$ regressors and data-censoring issues, reduced the sample size to 159 persons representing 260 person-years (see "Appendix" for more details of our event history analysis).

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[5] Because of issues with funding, interviews were not conducted in 1992 or 1993. Thus after Wave 5 interviews were completed in 1991 Wave 6 interviews were not completed until 1994.

Measures of Key Concepts

Outcome Variable: Self-Reported Gang Membership

We measure gang membership using a self-reported measure of being in a youth or street gang. The self-nomination method has been shown to be valid and robust in both detention and community settings (Decker et al. 2014b; Esbensen et al. 2001; Webb et al. 2006) and has been used in previous research to operationalize disengagement from gang membership (Melde and Esbensen 2011, 2013).[6] To be counted as a member of a street gang, respondents also had to have reported the gang (not necessarily the respondent) has been involved in fights with other gangs or participates in illegal activities. As Esbensen and Huizinga (1993) have argued, this ensures that youth are referring to a street gang and not a peer group. The outcome, enduring membership, occurs when the respondent reports not being a member of a gang after having been one (recall staying in the gang and leaving are statistically equivalent if p is the probability of leaving the gang, $1 - p$ is the probability of remaining in the gang).

Perceived Gang Organization

For each year that a respondent answered "yes" to being a member of a street gang, they were also asked a series of questions about the organization of the gang. Respondents were asked eight questions about the organization of their gang, including whether there were initiation rites, established leaders, regular meetings, rules or codes, specific roles, roles for girls, roles for specific ages, and colors and symbols (see Table 3 for exact wording). Perceived gang organization is a summed scale of the eight binary indicators and high scores indicate more organization. Similar questions and scales have been used in previous studies of gang organization (Fagan 1989; Bouchard and Spindler 2010; Decker and Van Winkle 1996; Decker et al. 2008; Pyrooz et al. 2012a, b).

To investigate the dimensionality of our measures of gang organization, we estimated a confirmatory factor model, specifying the eight indicators as measures of a unidimensional scale capturing gang organization.[7] In our sample, respondents transitioned in and out of gangs across the eight waves of data; therefore, to obtain estimates of measurement properties of gang organization and gang identity, we used measures taken from the first time point they reported being in the gang.[8] Because the items are measured on dichotomous scales, we used confirmatory factor models for binary data and found support for a one-factor model (see "Appendix"). Thus, we found no support for Pyrooz et al. (2012a,

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[6] Gang scholars have argued that leaving a gang is more of a process than a discrete event (Decker and Lauritsen 2002). Recent research has found that modeling leaving the gang as an event is a valid and reliable proxy for modeling leaving as a process (Decker et al. 2014b).

[7] We attempted to assess within gang reports of gang organization i.e., did respondents in the same gang report the same organizational characteristics. Respondents reported being members of what appear to be over 70 distinct gangs including 14 variations of Crips gangs and 3 variations of Bloods gangs. This is problematic as different types of Crips can be subsets of one another, or distinct entities entirely (Howell 2007). Due to limitations of the data we lack the ability to parse this out.

[8] This procedure will yield unbiased estimates of measurement properties (reliability) under the assumption of no age and cohort effects on measurement properties and change in true scores. Departures from zero age and cohort effects will result in downward-biased estimates of reliability. Therefore, our estimates should be considered lower-bound estimates of true reliability.

b) finding that gang organization is multidimensional, with some items exerting stronger effects on offending.

Gang Identity

As noted above, social psychologists commonly identify three domains of meaning that measures of social identity should capture: awareness of group membership, an evaluative component related to self-esteem, and an affective component related to commitment to the group (e.g., Brown et al. 1986; Ellemers et al. 1999). All six measures of the gang identity index are related to the feeling one gets from being a member of a gang; therefore, the measures satisfy the awareness of group membership component. For the evaluative component, we use items concerning collective self-esteem (Luhtanen and Crocker 1992), that have been widely used to measure social identity, and that have been used by Hennigan and Spanovic (2012) to measure social identity of gang members. Examples of collective self-esteem from gang membership include a sense of belonging, feeling respected, feeling important, feeling enjoyment, and feeling useful (see Table 3). To capture affective commitment, we use an item related to the importance of the gang and its activities. We estimated confirmatory factor models for ordinal indicators and found the six items formed a unidimensional scale (see "Appendix").

Self-Control

Previous research has operationalized self-control using attitudinal measures of impulsivity (Grasmick et al. 1993) and behavioral measures (Keane et al. 1993). Hirschi and Gottfredson (1993), however, criticized attitudinal measures, suggesting that weak findings may be the result of measurement error. They proposed using behavioral measures over attitudinal measures, emphasizing that offenses differ in their validity as measures of self-control, and argued that using "those offenses with large risk of public awareness are better measures than those with little risk" (1990, p. 90). We follow their suggestions by including alcohol consumption in public spaces in our three constructs measuring self-control. First, following Grasmick et al. (1993), we use a six-item attitudinal scale of impulsivity measured at age 11, including items such as "act without thinking," "do daring things," "impatient," and "bored easily." This scale has a Chronbach's alpha of 0.66 (see Table 1 for exact wording of items). Second, following Keane et al. (1993), we use a behavioral measure consisting of eight items capturing minor delinquency at age 11.[9] Third, following Gottfredson and Hirschi (1990), we use behavioral measures of drinking beer or hard liquor in the last year. Each of the behavioral measures exclude offenses that occurred at home, at a friend or relative's house, or alone to conform to Gottfredson and Hirschi's (1990, p. 90) recommendation of using offenses that have a "large risk of public awareness."

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[9] Recent research questions the stability of self-control through adolescence (e.g., Burt et al. 2014; Na and Paternoster 2012). Therefore, we use measures of self-control that are lagged one period in addition to time stable measures of self- control.

Table 1 Denver youth survey gang member duration descriptives

Years of gang membership	N (226)	Consecutive years of gang membership	Intermittent years of gang membership	Intermittent gang members disaggregated		
				Same gang	Different gang	Missing data
1	128	–	–	–	–	–
2	50	35	15	11	4	0
3	26	13	13	9	3	1
4	15	8	7	3	1	3
5	4	1	3	1	2	0
6	3	2	1	0	0	1
Multi-year sample totals	98	59	39	24	10	5

The intermittent same gang category represents an individual reporting non-consecutive years of gang membership as a member of the same gang. Intermittent different gang category represents respondents in non-consecutive years reporting being a member of a different gang. Missing data describes gang members who were not surveyed during the intervening person year

Demographic and Control Variables

A detailed description of our controls appears in Table 3. We include demographic measures of race/ethnicity, gender, socioeconomic status, and age. To control for prior involvement in criminal offending we use two measures: (1) an 18-item variety scale—to reduce the influence of minor offenses in the scale (Hindelang et al. 1981; Sweeten 2012)—of previous criminal offending; and (2) a summed frequency scale to measure victimization (see Table 3). We control for duration of time in the gang, which serves two important functions. First, we hypothesize that, once controlling for age, duration of time in the gang is directly related to time spent in the gang and its effect on leaving the gang. Longer durations may be associated with path dependence, reducing the likelihood of leaving the gang. Conversely, longer duration may lead to fatigue with gang life and diminishing returns from gang membership, increasing the likelihood of departure. Second, in proportional hazard models, the proportionality assumption is often violated when duration is omitted as a covariate.[10] We found that the effect of duration was not linear. Therefore, to capture the correct functional form of duration in our models, we use a series of dummy variables indicating whether an individual reported being a gang member 1 year, 2 years, or 3 or more years.[11] We also control for whether it is an individual's first or second episode in a gang, and the wave(s) in which an individual reported being in a gang. Finally, we control for several gang-related processes to isolate the effects of perceived gang organization and identity on enduring gang membership (see Table 3). Here, we include being or expecting to be a leader, gang centrality (which has been used to capture gang embeddedness) and whether the gang provides protection (found to be related to joining gangs) (Decker and Van Winkle 1996; Esbensen et al. 1999; Thornberry 2003).

Analytic Strategy

Our theoretical framework of gang organization, identity, and enduring gang membership implies a dynamic model in which changes in perceived organization and identity affect the timing of decisions to leave the gang. Therefore, we use a discrete-time event history model with time-varying covariates to examine the timing of decisions to leave the gang. Discrete-time event history (hazard) models are appropriate for three reasons. First, we are substantively interested in the length of time individuals stay in gangs, which implies that we want to model the hazard rate—the instantaneous probability of leaving per unit of time and the probability of staying or enduring as 1.0 minus the probability of leaving. The hazard rate is governed by duration of time in the gang. Second, because our age range over the ten waves is 11–26, we have a nontrivial number of right-hand censored cases—when the event (leaving the gang) is unknown. Unlike conventional multivariate models, hazard models correct for potential bias due to right-censoring. Third, the temporal unit of our panel data is years, which makes a discrete-time model appropriate.

Following Decker et al. (2014a), we assume that leaving a gang is more of a process that unfolds over continuous time, rather than a discrete event. Therefore, we model the

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[10] We also tested for non-proportionality by interacting key covariates with duration and failed to reject the proportionality assumption.

[11] It was necessary to collapse the 3-year, 4-year, 5-year, and 6-year gang members into one category due to the small N in the latter categories. Results from the reported models do not differ significantly from models ran with the linear term.

hazard rate of leaving a gang—defined as the instantaneous probability of leaving per unit of time— assuming that a continuous-time process governs the hazard rate. Our panel data, however, groups events into years, making the data discrete in time. Therefore, we use the discrete hazard model of Prentice and Gloeckler (1978), which becomes a continuous time proportional hazards Cox model as the intervals between discrete times becomes smaller and smaller (see Allison 1982; Kalbfleisch and Prentice 1980).

The discrete-time hazard rate P_{it} is the probability of leaving the gang, conditional on having survived to that point in time (in a given spell):

$$P_{it} = \Pr(T_i = t | t, X_{it})$$

where T is a random variable indicating the (uncensored) time of event. The corresponding hazard function is

$$P_{it} = 1 - \exp[-\exp(\alpha_t + \beta' X_{it})]$$

where αt is a set of constants for duration in the gang, β is a vector of regression coefficients, and X is a vector of independent variables, which can be stable or time-dependent.[12] This model is estimated by maximum likelihood using a generalized linear model with a complementary log–log link function (see Allison 1982):

$$\log[-\log(1 - P_{it})] = \alpha_t + \beta' X_{it}$$

Some of our respondents report leaving a gang and then joining a gang later during the study period. To increase the statistical power of our tests, we include these second events in a model for repeated events.[13] We model the hazard of leaving the gang using time-varying covariates for perceived gang organization and identity lagged one time period $(t-1)$ to ensure that the temporal order of variables corresponds to the causal order specified. For example, the hazard of leaving the gang at time 4 will be regressed on perceived gang organization and identity from time 3.

Our procedure allows us to address Decker et al's. (2013) recent critique of using panel data to study gang youth. They argue that the temporal ordering among variables is often confounded, which is exacerbated by the finding that the average length of gang membership is less than 2 years. Moreover, they maintain that, in panel designs, the "point measures" of independent variables measuring snapshots of individual attitudes and gang characteristics are inherently misaligned with "interval measures" of behavior. For example, they argue that if membership in a gang begins at wave two and ends at wave three, the prediction of behavior will be contaminated with non-gang time regardless of whether behavior is measured at wave two or three. We use a snapshot measure of current gang membership and predict future gang membership from 1-year lagged measures of perceived gang organization and identity. If the true time scale is continuous and our data are measured in categorical time due to the panel design, our complementary log–log model will give consistent estimates of the effects of lagged $(t-1)$ time-varying covariates.

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[12] As noted above, duration was found to be non-linear therefore we estimated duration dependence, using three dummy variables.

[13] We estimated a model for the first event of leaving a gang and found similar substantive results, but larger estimated standard errors. We also tested for interaction effects for key substantive variables by first versus second events, and failed to find significant interactions. Furthermore, we found that robust standard errors for clustering were similar in magnitude to our classical standard errors, suggesting that parameter estimates of our nonlinear model are not biased due to clustering (see King and Roberts 2015).

Results

Descriptive Statistics

Descriptive statistics for our sample of gang members are presented in "Appendix" Table 3. Consistent with previous research, DYS gang members reported being in a gang a short time. Forty-three percent of respondents reported being in a gang in only 1 year. Twenty-eight percent reported being in a gang for 2 years and 29% reported being in the gang between 3 and 6 years. This is consistent with previous studies of gangs using self-report surveys (Esbensen and Huizinga 1993; Thornberry et al. 2004; Pyrooz et al. 2012a, b).

Fifty-two percent of the sampled youth are Hispanic and more than 34% are African American, which reflects the racial and ethnic composition of Denver's inner-city neighborhoods. As expected, most of the sampled gang members are male (74%) and the modal category (61%) for parental education (used as a measure of SES) is less than a high school education. Finally, the mean age respondents reported joining a gang was 16 ($SD=2.33$). Because our event history models dropped 35% of the sample for data issues (e.g., lagged variables unavailable by design, censoring, missing values), we compared the full sample with the analyzed sample, and found only modest differences.[14]

In addition, given our outcome is the probability of exiting the gang, it is important to understand how gang membership unfolds across the life course. That is, are respondents involved in gangs for consecutive time periods, non-consecutive time periods, or both? Non-consecutive or sporadic periods of gang membership—termed intermittency—is defined as the rejoining of the gang after previously reporting exit (Pyrooz et al. 2012a, b) and is operationalized as reporting gang membership in non-consecutive years. Of the 226 self-reported gang members in the DYS, 39 (40% of the multiyear gang member sample, N=98) report non-consecutive years of gang membership.[15] This is consistent with previous research. Respondents in the Rochester Youth Survey report rates of intermittency between 27 and 57% (Thornberry 2003) and respondents in the Pathways to Desistence study report rates of intermittency of 57% (Pyrooz et al. 2012a, b). We explored this issue further by breaking down intermittency by both aggregate levels and by duration of time (See Table 1). Of the 39 total number of non-consecutive gang members in the DYS, we find 24 (61%) were intermittent by self-reporting the same gang in non-consecutive years. Ten respondents (26%) reported non-consecutive years of gang membership with different gangs. These respondents left one gang and later joined another. Finally, five respondents (13%) have missing data in their spell, leaving us unable to ascertain whether they actually left the gang at all.

Taken together, descriptive analyses and previous literature seem to support the claim that intermittency is likely to reflect the real world processes of individuals leaving and returning to gangs rather than a statistical artifact. It appears that respondents, after leaving gangs, may rejoin their previous gang or join a different gang. This, however, is just an exploratory descriptive finding. Future research using longitudinal data is needed to unpack and understand intermittency in gang membership.

[14] We examined the distribution of missing data on the key variables in our event history analysis (total of 35% compared to the full sample of gang members wave 1–10). We compared the distribution of 20 key variables for included observations against the excluded observations. Out of 20 total tests, only three showed statistically significant differences: included observations showed slightly higher scores on the gang providing protection, lower scores on childhood delinquency, and slightly higher scores on beer drinking. Moreover, our demographic variables, offending variables, gang organization, and gang identity are not significantly different between included and excluded observations (table available upon request).

[15] Here we report the full sample of gang members in the Denver Youth Survey not just our analytic sample.

Table 2 Complementary log–log hazard models predicting the probability of gang exit

	Model 1			Model 2			Model 3		
	Coef.	Robust S.E.	Hazard ratio e^{β}	Coef.	Robust S.E.	Hazard ratio e^{β}	Coef.	Robust S.E.	Hazard ratio e^{β}
Intercept	−2.16*	1.04	0.11	−0.82	1.32	0.44	−1.01	1.35	0.36
Control variables									
Race/ethnicity (Hispanic)									
Non-Hispanic black	−0.11	0.22	0.89	−0.09	0.23	0.92	−0.14	0.25	0.87
White_Other	0.88***	0.29	2.40	0.87**	0.30	2.38	0.83*	0.33	2.28
Male	−0.75***	0.24	0.47	−0.75**	0.26	0.47	−0.92**	0.27	0.40
Age at joining	0.02	0.04	1.02	0.00	0.05	1.00	0.03	0.05	1.03
Parental education level (Highschool)									
More than high school education	−0.03	0.37	0.97	−0.08	0.39	0.92	−0.30	0.41	0.74
Less than high school education	0.34	0.20	1.40	0.33	0.20	1.40	0.18	0.22	1.19
Duration (1 year gang member)			1.00						
2 Year Gang Member	0.16	0.13	1.17	0.15	0.14	1.17	0.17	0.15	1.18
3+ Year Gang Member	0.26	0.35	1.30	0.12	0.39	1.13	0.19	0.44	1.21
Episode	1.21**	0.41	3.35	1.56***	0.44	4.76	1.64***	0.46	5.14
Offending and victimization variables									
Offending variety scale							0.04	0.03	1.04
Victimization frequency scale							0.00	0.01	1.00
Low self-control variables									
Childhood delinquency	0.00	0.05	1.00	−0.01	0.06	0.99	−0.01	0.07	0.99
Attitudinal scale	0.29	0.20	1.34	0.21	0.21	1.24	0.13	0.21	1.13
Frequency of beer drinking with friends outside the home	−0.03*	0.01	0.97	−0.03*	0.01	0.98	−0.03*	0.01	0.97
Frequency of hard liquor drinking with friends outside the home	0.01	0.03	1.01	0.02	0.04	1.02	0.02	0.03	1.02

Table 2 (continued)

	Model 1			Model 2			Model 3		
	Coef.	Robust S.E.	Hazard ratio e^β	Coef.	Robust S.E.	Hazard ratio e^β	Coef.	Robust S.E.	Hazard ratio e^β
Gang control variables									
Does the gang protect its members?				0.35	0.60	1.42	0.36	0.61	1.44
Are you a leader?				−0.41	0.42	0.67	−0.43	0.43	0.65
Do you expect to be a leader?				0.11	0.28	1.11	0.30	0.30	1.35
Gang centrality				−0.09	0.08	0.92	−0.07	0.09	0.93
Focal gang variables									1.00
Gang identity				−0.20*	0.11	0.82	−0.31*	0.12	0.74
Gang organization				−0.13*	0.05	0.88	−0.12*	0.05	0.88
Log pseudolikelihood	−151.40			−140.0236			−126.64		
Wald Chi square (d.f)	60.74(19)		N = 256	62.94 (25)		N = 245	56.57(27)		N = 225

For dummy variables, reference categories appear in parentheses. Because of small effect sizes, beer and hard liquor consumption were divided by 10. Duration of time in gang governs the hazard of desistance

*$p \leq .05$ **$p \leq .01$ ***$p \leq .001$

Probability of Gang Exit

Table 2 presents results from our event history model of the hazard rate of leaving the gang.[16] We control for duration in the gang as well as episode (indicating that the gang member has left a gang in the past and is now in the second spell of gang membership). The probability of leaving a gang for those in their second episode of gang membership is substantially higher (($3.35 - 1) \times 100 = 235\%$, Model 1) than those in their first episode, as expected.[17] Among our exogenous variables (Model 1), the rate of leaving gangs for whites is substantially higher (140%) than for Hispanics (the omitted race-ethnicity category), and 53% lower for males than for females. Among our measures of self-control, only public beer drinking significantly affects the rate of leaving the gang: gang members who consume 10 more beers a year have (on average) a 3% lower rate of leaving the gang. Moreover, we fail to reject the null hypothesis that all measures of self-control combined have an effect that is equal to zero ($\chi^2 = 8.85$, $df = 4$, $p > .05$).

Model 2 adds our gang variables to the model. Controlling for other covariates, none of the gang process variables is significantly associated with the length of time in the gang. Model 2 tests our major substantive hypotheses, that perceptions of strong gang organization (Hypothesis 1) and strong gang identity (Hypothesis 3) are associated with enduring gang membership. We find that perceived gang organization is negatively and significantly associated with the rate of leaving the gang, supporting Hypothesis 1. Specifically, each additional feature reported in the gang organization scale is associated with a 12% decrease in the rate of leaving the gang. We also find that gang identity is negatively and significantly associated with the rate of leaving the gang (18% decrease), supporting Hypothesis 3. Finally, we are able to reject the null hypothesis that, controlling for self-control variables, the joint effects of perceived gang organization and identity are equal to zero ($\chi^2 = 10.09$, $df = 2$, $p < .01$). This finding fails to support the general theory argument that self-control is more central to remaining in a gang than perceptions of organization or having a gang identity.

Model 3 adds controls for prior offending and victimization. Both show effects on enduring gang membership that are trivial in size and statistically indistinguishable from zero. Moreover, the coefficients of Model 3 do not differ appreciably from those of Model 2.[18] Therefore, we find no evidence that our effects of perceived gang organization and gang identity on enduring gang membership are spurious due to prior experiences. Furthermore, after controlling for self-control and previous offending, the joint effects of gang organization and identity were again found to be statistically distinguishable from zero ($\chi^2 = 11.60$, $df = 2$, $p < .01$). In sum, we find support for our main thesis, that length of time in the gang is a function of perceived organization of the gang and identification with the gang. Thus, enduring membership in a gang is neither random nor entirely a function of low self-control, but rather is systematically associated with perceptions of gang organization and how central the gang is to one's identity.

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[16] Tests were conducted to assess whether multicollinearity was an issue. A correlation matrix indicated no extremely high correlations and variance inflation factors (VIFs) indicated no issues with multicollinearity.

[17] All results are reported in the text use the formula ($^{\beta} - 1) \times 100$ so results indicate the percentage change in the probability of exiting the gang given the respondent has not yet left.

[18] We purposely used all available observations for each model to increase power. We conducted sensitivity checks using a listwise approach restricting the sample size of all three models to the smallest model (Model 3, N = 225) and results were consistent with reported models.

Finally, we examine the relationship between gang organization and gang identity. First, we computed the correlation coefficient for gang identity and gang organization. Second, we conducted a confirmatory factor analysis specifying gang organization and gang identity as distinct yet correlated latent constructs. Surprisingly, in both cases we found our statistical tests do not support our second hypothesis—that gang organization and gang identity are positively associated. The correlation coefficient for the scales was 0.03 and the confirmatory factor analysis showed a correlation between latent factors, organization and gang identity, as 0.01. Taken together, under the assumption that the model is specified correctly, it appears that identity and organization each exerts independent effects and are not positively associated as predicted by social identity theory.

Discussion

This paper developed a theoretical framework to understand enduring membership in street gangs. In other words, what factors are associated with increases in the length of time individuals remain in street gangs? We argued that gang organization and gang identity are associated with enduring membership in a gang. Using discrete-time event-history models and eight waves of panel data on high risk youth from the Denver Youth Survey, we tested our theoretical framework against a competing explanation posited by Gottfredson and Hirschi (1990).

Our results support two of our three hypotheses. Both perceptions of gang organization and gang identity are positively associated with remaining in a gang. This holds in a discrete-time hazard model that assumes an underlying continuous process of gang departure and controls for right censoring, self-control, demographic characteristics, and time-varying gang-process variables. Surprisingly, however we do not find support for our hypothesis positing that gang organization and gang identity are positively associated. Instead of gang identity being bolstered by organizational features of the gang (e.g., initiation rites, presence of rules or codes), as organizational theory and social identity theory suggest, the two constructs were empirically unrelated. The finding that perceived organization of one's gang is unrelated to one's level of identification with that gang suggests that both concepts deserve further research as they are clearly, yet independently, associated with decisions to remain in a gang.

Our findings suggest that the general theory of crime does not apply to enduring gang membership. We failed to reject the null hypothesis that together our three measures of self-control exert no effect on enduring gang membership. Only the behavioral measure, public drinking in the company of others, was associated with enduring gang membership. Furthermore we are unable to rule out the possibility that our behavioral measures are tapping continuity in behavior, rather than self-control, and that our finding is merely the result of stability in deviance. More importantly, our positive findings that gang organization and gang identity are related to enduring membership in a gang—even when holding constant self-control—runs counter to the general theory.

Our finding, that individuals who perceive their gang as more organized stay in gangs longer, is based on respondent's reports about their gang. As noted earlier, we take a pragmatist view and assume that, while perceived organization is rooted in objective organization, at the same time, it is gang organization as perceived by the gang member that influences decisions to leave a gang. Future research should obtain objective measures of gang organization, examine the correspondence between objective and subjective organization, and test the hypothesis that subjective measures mediate the effect of objective measures.

Additionally, we find that individuals with stronger gang identities tend to remain in the gang longer than those who do not identify as strongly. This raises an important secondary question concerning the formation of gang identities: What social processes help produce and reproduce strong identification with the gang? Social identity theory suggests that gang identities develop through a series of in-group versus out-group comparisons, in which individuals compare the in-group (gang) with out-groups in which membership is a possibility (e.g., rival gangs). When a person perceives an out-group as more prestigious, more reliable and certain, and better able to meet his or her needs, the person can either work to improve the in-group or join the out-group. This holds for conventional out-groups, which could help pull members out of their gangs. For example, the process of falling in love and getting married may lead a member to leave the gang to join the ranks of the married if, at that time, being married is seen as more prestigious, reliable, and meeting needs than being in the gang. Our sample and timeframe precluded us from examining such secondary hypotheses as we had insufficient variance in life course transitions among gang members. Future research is needed to explore these questions, which would link our findings about gang identity to life course transitions acting as "hooks for change"—or pull factors as they are commonly called in gang research—in transitioning from gang identities to conventional role-identities such as spouse, parent, and wage-earner (e.g., Giordano et al. 2002; Laub and Sampson 2003).[19]

It is important to reiterate that our research design produces a representative sample of gang-involved youth from disadvantaged neighborhoods in Denver in the 1990s. These data describe gangs and gang membership in a time when Denver was an emerging gang city, rather than a traditional gang city. While providing a different lens to explore gang issues, these data may not be generalizable other locations and their gang populations. Moreover, while gang members are disproportionately likely to be found in these neighborhoods, our design does not provide a representative sample of gangs. The distribution of gangs (as opposed to gang members) in our sample is not known. In order to allow for broader generalization, future research could conduct longitudinal surveys of a representative sample of gangs, with gang members nested within them. The logistical challenges for such a research design calls for creative and innovative solutions, however.

Our conceptual framework and modeling strategy focusing on enduring gang membership has implications for recent research on the stages or processes of leaving gangs. For example, Decker et al. (2014a) have theorized disengagement from gangs takes place in a series of stages. These stages are first doubts, followed by anticipatory socialization, then turning points, and culminating in post-exit validation as individuals transition into new roles. Gang scholars have also advanced a signaling perspective for gang disengagement where inner personal change (e.g., Maruna 2012) focal to the disengagement process is private information that must be signaled to the outside world (Densley and Pyrooz 2017). In other words, to be complete, the private-personal transformation—in this case making a decision to leave the gang—is strategically signaled to relevant others in the social world. Our framework and process model are compatible with these theoretical arguments. As noted above, our hazard model assumes that leaving a gang is a continuous-time process that underlies the observed discrete-time observations. Future research is needed to collect data measuring stages of leaving gangs, private transformations, and public signaling to others. Although collecting continuous-time data on these processes is virtually intractable, discrete-time data on gang

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[19] Recent research by Pyrooz et al. (2017) has found some support for parenthood as a turning point or pull factor in the life course of gang members.

processes with inter-temporal intervals shorter than a year could approximate continuous time more closely.

Our approach fits well into Short's (1985) classic application of levels of explanation to gang research, in which he distinguishes three levels of explanation: the individual (micro-level), the gang and social system of gangs (macro-level), and social interaction (group process) (see also Short 1998). We have examined two levels of explanation by exploring the interplay between, on the one hand, features of gangs (gang organization) and individuals (gang identity) on the rate of individual enduring membership in gangs. Future research is needed to sample gangs and members within gangs and estimate multi-level models. While our dynamic model of leaving gangs is consistent with an underlying process model, our design does not allow us to examine moment-by-moment group processes. We argue, following Matsueda (2013, 2017), that social interactions among individuals produce and reproduce macro-outcomes, such as gang organization, gang membership rates, and social systems of street gangs. Ethnographic research is needed to articulate such social interactions (e.g., Short and Strodtbeck 1965), which can then be explored with simulations from agent-based models.

In conclusion, our results provide strong evidence that perceived gang organization and gang identity help keep members in gangs for longer periods. Thus, our results contribute to the growing literature finding that, net of individual characteristics like low self-control, organization among criminals remains an important explanatory concept in criminology (e.g., Steffensmeier 1989; Gambetta 1993, 2009; Shortland and Varese 2016).

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Appendix

Here we describe in more detail our event history analysis, including treatment of repeated events, treatment of left-hand censoring, and treatment of missing data. We also report results from confirmatory factor analyses for gang organization and gang identity.

Event History Model Specifications

Our event history models use time since entering a gang as the clock governing enduring gang membership.

Treatment of Repeated Events

A few respondents left the risk set (self-reported that they were no longer in the gang) and then in later waves returned to the gang. Recall that the hazard of enduring gang membership is governed by a clock that measures duration of time in the gang. After an individual desists from the gang, their clock is reset to 0 and their second event is treated as separate from the first. In addition, a dummy variable (Episode) is added to the model indicating whether it was a respondent's second event (Allison 1982). We found that robust standard errors clustered on individuals were similar to classical standard errors, suggesting that our non-linear parameter estimates are not biased due to clustering (King and Roberts 2015).

Left-Hand Censoring

Observations are left-censored when the start of the event time is unknown. This occurs in our event histories in a few cases in which respondents reported being in a gang at the first wave, and we do not know precisely when they joined. It is often recommended that left-censored cases be removed from analysis to reduce bias (Singer and Willett 2003). Nevertheless, when the number of left-censored cases is substantial and are correlated with duration, bias will remain. A key question here is at what age to most youth join gangs? Howell and Griffiths (2015) reported that the typical age ranges youth members join a gang is between 11 and 15 years old. Two recent studies using the National Longitudinal Survey of Youth found similar results (Pyrooz 2014; Pyrooz and Sweeten 2015). Thus, previous research indicates that most youth join gangs in their early teenage years, with a few outliers joining at a younger age. The DYS captures not only those at prime gang-joining age, but the majority of early-onset outliers. DYS respondents were given their first youth survey at approximately age 11 and were asked: "in the past year were you a member of a street gang?" This covers gang membership beginning at age 10, the low end of the age spectrum for joining a gang. Thus, while it is possible that a youth could have joined and left a gang by age 10, it is extremely unlikely. Therefore, it is reasonable to assume that the DYS captured the majority, and possibly all, gang-involved youth in the sample and left censoring is negligible (Table 3).

Treatment of Missing Data

Missing data arises from a number of sources, including (1) the time-lagging of covariates; (2) key predictor variables not being asked until Wave 3; and (3) respondents not being interviewed in the person-year before the spell (left censoring) or in the person year after the spell (right censoring). The first two sources of missing data are unlikely to be systematic or biasing; they led to dropping 52 person-years from analysis. Individuals with data missing in the person-year before the spell began were left-censored and eliminated from the study ($N=26$) (Singer and Willett 2003). Right censoring (when the event occurrence is unknown because the study ended or the person was not sampled in the subsequent wave) of 66 person-years is handled by our event history models (Allison 2013).

Table 3 Variable descriptions and descriptive statistics, denver youth survey waves 3–10. N = 159

Variable name	Description	Mean (%)	S.D.	N
Control variables				
Duration in gang				
1 Year	Respondent reported gang involvement in one time point	43		69
2 Year	Respondent reported gang involvement in two time points	28		45
3 Year	Respondent reported gang involvement in three time points	16		25
4 Year	Respondent reported gang involvement in four time points	8		13
5 Year	Respondent reported gang involvement in five time points	3		4
6 Year	Respondent reported gang involvement in six time points	2		3
Race/ethnicity				
Hispanic	0 = Non-Hispanic, 1 = Hispanic	52		82
Non-Hispanic black	0 = Non-Black, 1 = Black	34		54
White_Other	0 = Non-White or other race, 1 = White or other race	15		23
Male	1 = Male	74		117
Female	0 = Female	26		42
Parental education level				
High school	0 = Parent completed high school (omitted category)	28		45
More than high school education	1 = Parent completed more than high school	11		17
Less than high school education	1 = Parent did not complete high school	61		97
Age at joining gang	Age respondent joined gang	16.22	2.33	159
Gang process variables				
Protection	The gang provides protection, 1 = Yes	97		153
	The gang provides protection, 0 = No	3		5
Leader	1 = Respondent reported being a gang leader	7		11
	0 = Respondent reported not being a gang leader	93		147
Expect to be a leader	1 = Respondent reported expecting to be a gang leader	16		25
	0 = Respondent reported not expecting to be a gang leader	84		131

Table 3 (continued)

Variable name	Description	Mean (%)	S.D.	N
Centrality	If the Target Scale represents the activities that go on in your gang, how far out from the center of things are you, 1 = The outer edge, 5 = The center	3.40	1.21	156
Focal gang variables				
Gang identity	Being in a gang makes me feel important	2.71	1.03	157
	Being in a gang makes me feel respected	3.07	1.08	157
	Being in a gang makes me feel like I' a useful person to have around	2.97	1.01	157
	Being in a gang makes me feel like I really belong somewhere	2.96	1.02	157
	I really enjoy being a member of a gang	2.96	1.11	157
	How important to you is the gang and their activities	2.81	1.39	156
	Gang identity: six item scale	2.90	0.88	155
Gang organization	There are initiation rites, 1 = Yes	84.00		133
	There are initiation rites, 0 = No	16.00		26
	The gang has established leaders, 1 = Yes	63.00		99
	The gang has established leaders, 0 = No	37.00		59
	The gang has regular meetings, 1 = Yes	44.00		69
	The gang has regular meetings, 0 = No	56.00		89
	The gang has specific rules or codes, 1 = Yes	67.00		106
	The gang has specific rules or codes, 0 = No	33.00		52
	Gang members have a specific role, 1 = Yes	56.00		87
	Gang members have a specific role, 0 = No	44.00		69
	There are specific roles for each age group, 1 = Yes	28.00		45
	There are specific roles for each age group, 0 = No	72.00		113

Table 3 (continued)

Variable name	Description	Mean (%)	S.D.	N
	There are specific roles for girls, 1 = Yes	25.00		40
	There are specific roles for girls, 0=No	75.00		118
	The gang has colors and symbols, 1 = Yes	91.00		143
	The gang has colors and symbols, 0=No	9.00		15
	Gang organization summed scale 0–8.	4.58	2.00	156
General theory of crime (low self control)				
Childhood delinquency	Self-reported variety scale of minor offending taken when the respondent was approximately 11 year old. Items include skipping school, suspended from school, cheating, public drunkenness, purposely damaging property, curfew, minor assault, throwing things at people, and stealing less than 5 or 50 dollars. When possible offenses reflected respondent's reporting offenses with friends and not at home (0–12).	1.16	1.57	159
Attitudinal scale	The attitudinal scale is a six-item scale comprised of: "act without thinking," "risk taking," "like to do daring things," "are impatient—want to have things right away," "get bored easily," and "get upset when you have to wait for something," These variables are coded as 3 = "Strongly agree," 2 = "Somewhat agree," and 1 = "Disagree." We take these measures from when the individual was approximately 11 years of age	2.05	0.46	159
Frequency of beer drinking	Beer drinking Frequency Scale: In the last year, how often did you drink beer, not including times you drank alone or at home, a friends house, or a relatives house	35.23	84.87	157
Frequency of hard liquor drinking	Hard liquor drinking Frequency Scale: In the last year, how often did you drink hard liquor, not including times you drank alone or at home, a friend's house, or a relative's house	10.31	38.90	159
Offending and victimization				
Offending variety scale	Self-reported offending variety scale including involvement in 18 possible acts of delinquency such as throwing objects at people, gang fights, using and selling drugs, assault, robbery, and theft in the last year	4.43	3.81	155
Victimization frequency scale	Self-reported victimization frequency scale indicating if the respondent was strongarmed by someone with a weapon, hit by someone trying to hurt them, or attacked by someone with a weapon trying to seriously hurt or kill them in the past year.	2.58	9.76	150

Table 4 Confirmatory factor analyses: gang identity and gang organization

Latent construct	Observed variable	Standardized coefficient	S.E.
	Being in a gang makes me feel important	0.86	0.02***
	Being in a gang makes me feel respected	0.80	0.03***
	Being in a gang makes me feel like I' a useful person to have around	0.77	0.03***
	Being in a gang makes me feel like I really belong somewhere	0.77	0.03***
Gang identity N = 222	I really enjoy being a member of a gang	0.71	0.03***
	How important to you is the gang and their activities	0.66	0.05***
	Error correlations		
	How important with enjoymember	0.43	0.05****
	Feel belong with enjoymember	0.23	0.05***
	Feel belong with feel useful	0.59	0.05***
	Initiation rites	0.52	0.10***
	Established leaders	0.44	0.09***
	Regular meetings	0.48	0.09***
Gang organization N = 199	Specific rules or codes	0.69	0.07***
	Specific roles	0.92	0.06***
	Roles for each age group	0.76	0.07***
	Roles for girls	0.73	0.07***
	Colors and symbols	0.67	0.10***

RMSEA = 0.05 (Gang Identity), 0.00(Gang Organization). $\chi^2(6) = 10.331$; $p < .11$ for Gang Identity; $\chi^2(20) = 10.59$; $p < .96$ for Gang Organization

***$p \le .001$

Confirmatory Factor Analyses

To investigate the dimensionality of gang organization and gang identity we estimated confirmatory factory models for ordinal and dichotomous indicators using one time point for each respondent. These models using scale appropriate polychoric correlations under the assumption that underlying each ordinal indicator is a continuous latent construct. We found similar results using diagonally-weighted least squares and maximum likelihood with Satorra-Bentler corrections for test statistics. We observed high factor loadings for both gang organization (range 0.44–0.92) and gang identity (range 0.66–0.86) indicating each observed variable is strongly related to the corresponding latent construct (see Table 4). Moreover, fit statistics for both gang organization ($\chi^2 = 10.59$, $df = 20$, $p < .96$) and gang identity ($\chi^2 = 10.33$, $df = 6$, $p < .11$) indicate one-factor solutions.

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