# Trusting the untrustworthy: The social organization of trust among incarcerated women

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**Acknowledgments**

This research is supported by funding from the National Institute of Justice (2016-MU-MU-0011). The content is solely the responsibility of the authors and does not necessarily represent the official views of the respective agencies. We thank Elaine Arsenault, Ted Greenfelder, Nicole Harrington, Sade Lindsay, Alex Russo, and Michaela Soyer for their interviewer assistance. We also thank Scott Duxbury for assistance with modeling and Audrey Puckett for assistance with editing. We also thank three anonymous reviewers and the editor for their improvements to the manuscript.

# Trusting the untrustworthy: The social organization of trust among incarcerated women

Although the benefits of trust are well documented across a variety of settings, little empirical attention has been dedicated to trust in carceral settings, particularly among incarcerated women. Knowing how individuals in prison establish relationships of trust with one another is crucial for understanding how individuals adjust to conditions of confinement. Using data from 133 incarcerated women in a Pennsylvania prison unit, this study adopts a network approach to examine the role of individual and structural determinants of trust using exponential random graph models. Findings provide weak support for the claim that individual determinants (e.g., age, religious affiliation) shape whether women are more likely to trust someone to support them during an argument or a dispute. Instead, our findings show that structural determinants are the primary drivers of trust relationships. Trust is deeply entwined with friendship relations among women who get along with each other. Our approach paves a new path for the examination of trust in correctional settings and other criminological contexts.

Keywords: trust, women, incarceration, network, ergm

"The prisoner is never allowed to forget that, by committing a crime, he has foregone his claim to the status of a full-fledged, *trusted* member of society… [T]he loss of that more diffuse status which defines the individual as someone to be trusted or as morally acceptable is the loss which hurts most." (Sykes, 1958: 66-67, emphasis in original)

## Introduction

The presumption of trust, and its value for facilitating social interaction, is so ubiquitous in day-to-day encounters that it typically goes unnoticed. The importance of trust has been demonstrated across a variety of settings: people who trust have improved health and well-being (Ward & Meyer, 2009), neighborhoods with higher levels of trust are safer (Sampson, 2012), and countries with higher levels of trust are more productive (Fukuyama, 1995). Yet, there are also certain settings where trust is riskier, and misplacing trust in others can result in serious adverse outcomes. The purpose of this study is to evaluate trust relations in a unique setting characterized by high uncertainty and risk in deciding whom to trust—that is, a prison setting where the incarcerated face a daily dilemma: Whom can you trust when you yourself are no longer viewed as trustworthy?

In his classic work, *The Society of Captives*, Gresham Sykes (1958) detailed the "pains of imprisonment" that individuals experience during their incarceration (see also Listwan et al., 2013). Among these salient pains is losing credibility as someone who can be trusted and managing the stigma associated with being identified as untrustworthy. In addition, individuals are involuntarily placed in a setting with other criminally sanctioned strangers, who have also been stripped of their trustworthiness by their mere presence in the institution. In this context of heightened risk, stigma, and suspicion, inmates must decide who is trustworthy and how to manage their relationships with other prisoners. As Sykes (1958: 77) poignantly observed: "even if the individual prisoner believes that he himself is not the sort of person who is likely to attack or exploit weaker and less resourceful fellow captives, he is apt to view others with more suspicion."

Who will protect me, should violence arise? With whom can I share intimate knowledge that may damage my reputation? Who can I rely on to help me through my day-to-day struggles?

Whereas Sykes (1958) was describing the pains of imprisonment experienced by men, similar issues surrounding trust are just as or more critical for incarcerated women, in part as a result of the primacy of interpersonal relationships for women's well-being (Crew, Hulley, & Wright, 2017; Dye & Aday, 2013; Leigey & Reed, 2014; Lempert, 2016; Liebling, 2009). Many incarcerated women feel the deprivation of separation from loved ones, especially children, more acutely than incarcerated men. In part, this is because they receive fewer visits from family, friends, and children while incarcerated compared to men (c.f. Cochran, Mears, & Bales, 2014) and because women's prisons tend to be located much further away from the primary residence where their children are likely to be found. Relationships with other prisoners may fill part of the void resulting from the disruption and absence of family relationships. Yet, just like male prisoners, incarcerated women find themselves in a situation where it is difficult and risky to trust other prisoners. Similar to the non-incarcerated population, women in prison are also influenced by stereotypes and prejudices about convicted prisoners and perceive many shortcomings in the other prisoners housed within their institution, leading them to closely monitor their interactions with others (Greer, 2000; Severance, 2005).

The issue of broken trust and fear of trusting others is an enduring theme of ethnographic research focusing on incarcerated women (Dye & Aday, 2013; Leigey & Reed, 2014; Lempert 2016; Liebling, 2009; Owen, 1998). Despite the heightened risks of trusting others in prison, most incarcerated women have a deep yearning for intimacy that is often in tension with their experiences and fears of trusting others (Crewe, Hulley, & Wright, 2017; Girshick, 1999; Owen, 1998). Thus, despite their general mistrust of other inmates, most incarcerated women do manage

to form at least some supportive and trust-based relationships in prison, that help them manage their incarceration (Greer, 2000; Kruttschnitt, Gartner, & Miller 2000; Severance, 2005).

Knowing whether and how incarcerated women establish relationships of trust with one another is crucial for understanding whether and how individuals adjust to conditions of confinement. However, existing research provides few answers. Despite a fairly robust literature documenting the benefits of trust (see Hosking, 2014 for a recent review), little is known about how trust is *organized* in prisons. The shortage of knowledge stems from a lack of conceptual work on the concept of trust in corrections, specifically and criminology in general. In seeking to shed light on how individuals make decisions about who is trustworthy, we adopt a network approach and follow the growing body of scholarship that recognizes the unique theoretical and empirical contributions that can be gleaned from a network perspective.

Referred to as the "Criminology of Inmate Networks," Kreager and colleagues (2016a, 2017) advocate for the importance of contemporary research to focus on the organization and structure of inmate society to better understand how the experiences of incarceration shape health, well-being, and future outcomes (see also Haynie et al. 2018; Schaefer et al. 2017). Using network methods, this body of research used survey methods and network data to examine inmate society in a medium-security male prison unit in PA (Haynie et al., 2018; Kreager et al., 2016a, 2017; Schaefer et al. 2017). Findings revealed that male inmates in this unit were organized into fairly dense friendship groups, composed of reciprocated friendship ties (Schaefer et al. 2017) that were dominated by influential prosocial, older men on the unit whose power/influence derived from the public goods they made available to other unit inmates (Kreager et al. 2017). Taking a similar approach but focusing on inmate society in a women's prison unit in PA, we further expand research in this area by evaluating the role of individual and structural determinants of trust ties

between incarcerated women in this unit and test hypotheses concerning the development of trust relationships in a women's correctional setting. We uniquely contribute to this body of knowledge by drawing on recent theoretical and empirical work on trust as a *relational* concept that emphasizes the network of relational ties among incarcerated women.

## Trust

### *Definitional and Conceptual Issues*

While there is no single definition of trust (see Nannestad, 2008), there is some consensus on the meaning. Trust is cognitive as it involves a belief about another person's "trustworthiness for a particular matter at hand that emerges under conditions of unknown outcomes" (Robbins, 2016: 285). A key feature of trust situations is the willingness to commit to exchange before knowing if another person will reciprocate. Thus, individuals are at risk of adverse outcomes if those they trust, do not act as expected (Coleman, 1990; Granovetter, 1985). As such, trust is relational and involves risk by making individuals vulnerable to potential malfeasance from others (Cook, 2005; Levi & Stoker, 2000; Tilly, 2004).

In this study, we follow Hardin (2002), who conceptualizes trust as a three-part relation where A trusts B to do X underscoring the critical role of context for helping us understand what trust means, and Cook (2005) who conceptualizes trust as relational and arising through various relationships that emerge between individuals in specific contexts. Thus, when measuring trust, it is essential to specify *with whom* and *what it is* that individuals trust particular others to do, a level of precision largely absent from the voluminous research on trust, particularly in criminology and criminal justice. From this view, trust is "specific" in the sense that it applies to a particular person and a particular context and directs attention to both the receiver and perceiver of trust, rather than referring to a general sense of how trustworthy others may be (i.e., generalized trust) or whether

one trusts some abstract group (i.e., particularized trust).

Adopting such a relational, context-specific measurement of trust necessitates a social network approach and measurement strategy. As Kreager and colleagues (2016a: 1002) emphasize the "allure of a network approach lies in its recognition that the causes of phenomenon are often not located in independent, individual units, but instead are found in the interdependent web of relationships connecting individuals" (also see Wellman and Berkowitz, 1988). In this study, we examine a specific context that is highly relevant in the prison environment: A trusts B to support her during a dispute or an argument. We adopt this contextual and relational conceptualization as there is a growing literature that is critical of more generalized approaches to measuring trust that do not focus on specific matters or specify the particular individual who is trusted (e.g., Smith, 2010; Hu, 2017). Moreover, as we highlight below, having trust in another person to support you in arguments or disputes is a particularly critical type of resource to possess when navigating the dangerous and unpredictable prison environment.

***Trust in Prison***

The prison context provides a particularly compelling site for examining how individuals come to trust others because it manifests several salient features identified in trust research. First, as Heimer (2001: 43) has argued, the inability to predict the actions of others due to a lack of information (i.e., uncertainty) is a defining feature of trust situations. Prisoners face considerable uncertainty about the intentions of others as they interact with strangers placed together through coercive force (Kramer 1999). Thus, we might expect an absence or very low levels of trust in correctional settings. A second feature is that prisoners are particularly vulnerable to abuses of trust (Heimer, 2001) as there are no regulatory institutions to protect against the effects of misplaced trust. In the absence of institutions that protect against failed trust (e.g., legal recourse), individuals

may forego potentially beneficial relationships (Hardin, 2002: 4). Alternatively, the risks may be asymmetric in that the costs of misplaced trust far outweigh the gains of trust. In such circumstances, individuals have little incentive to invest in institutions or relationships that facilitate the transmission of information (e.g., word-of-mouth or reputation systems) that would overcome problems of trust (Frey, Buskens, & Raub, 2015; Raub, Buskens, & Frey 2013; Frey, 2017). Finally, the prison setting abruptly disconnects inmates from their previous network members comprised of family, friends, and acquaintances outside of prison, while simultaneously and involuntarily placing criminally-sanctioned individuals in forced proximity to one another. Together, these features of prison social interaction make it especially challenging to form trust-based relationships with other inmates.

Although the risks associated with trusting others are magnified in prison, there are also substantial advantages to forming trust relationships. These include the provision of companionship and social support that can help inmates cope with the pains of imprisonment (Collica, 2010; Hart, 1995; Huggins et al., 2006; Owen et al., 2017; Wolf-Ludden, 2012; Schaefer et al., 2017). Trusted inmates may also provide increased safety, as well as advice, resources, and help navigating the prison environment (Owen et al. 2017; Severance, 2005). Of particular importance for survival in prison is trusting that specific individuals will provide support when disputes or arguments inevitably emerge. Prison culture is inherently conflict-laden as a result of the scarcity of resources, overcrowding, lack of privacy, the prevalence of mental health issues, and forced interactions (Owen et al., 2017). Negotiating this conflict and threat in prisons is a daily activity that requires constant attention. Knowing that others will provide support during conflicts likely reduces the occurrence of violent and non-violent altercations as well as providing a sense of security to those with such relationships.

***Trust among Incarcerated Women***

Despite the unique setting offered by prisons for studying trust, empirical research is sparse, providing little insight into why trust relationships may (or fail to) develop among prisoners. The few existing studies almost entirely focus on the role of trust in preventing violence or aggression among incarcerated men (e.g., Liebling and Arnold 2012; Slade 2016; Kreager et al. 2016b) and rely on measures of generalized trust (which measures the psychological tendency to be trusting, regardless of context [see Rotter, 1967]). This research may say little about the role of trust in women's prisons as physical violence is less endemic, although verbal, emotional, and relational aggression is quite common (Kreager & Kruttschnitt 2018: 270; Trammell, 2009). Research that has focused indirectly on issues of trust among incarcerated women centers on relationships with other prisoners and whether and how these relationships compensate for the deprivation of separation from family and loved ones. While early research emphasized the importance of sexual and pseudo-family relationship ties as a necessary adaptation for incarcerated women (Giallombardo, 1966; Forsyth et al., 2002; Owen, 1998; Severance, 2005; Huggins et al., 2006), more contemporary research shows less emphasis placed on kinship ties and much greater concern with the risks associated with in-prison relationships. In many cases, lack of trust emerges as a serious barrier preventing incarcerated women from forming close relationships with one another (Greer, 2000; Kruttschnitt, Gartner, & Miller 2000; Severance, 2005).

Although based on small samples, several rich qualitative studies of incarcerated women suggest that the importance of intimate and friendship-based relationships may be declining over time, in part due to eroding trust in more punitive neoliberal prisons. For instance, Tramell's (2009) qualitative interviews with 33 paroled women in CA illustrated the high prevalence of interpersonal conflict and damaging interpersonal relationships that occurred during incarceration.

In particular, the women spoke of the use of rumors and gossip to ostracize and damage the interpersonal relationships of other women. As a result of this relational aggression, it was both challenging and dangerous to trust other women. Prisoners who manage to overcome these challenges and form trusted relationships may be at reduced risk of experiencing interpersonal conflict with others, especially if the trusted relationship involves those with higher status or influence whom others would be less likely to argue with (also see Owen et al. 2017).

Similar to Tramell's findings, Greer's (2000:447) qualitative interviews with 35 incarcerated women revealed strong feelings of mistrust characterizing prisoner relationships, with the women describing other prisoners as self-serving and untrustworthy, and questioning the motives of women who appeared too friendly. Although many of the women described themselves as loners, most reported having at least one person whom they trusted and considered a friend. Likewise, Kruttschnitt, Gartner, and Miller's (2000) study found that although friendships with other prisoners played a significant role in how they did their time, women remained very concerned about the risks of trusting other prisoners. A somewhat similar picture emerges in Severance's (2005) qualitative study of 40 incarcerated women. While she noted that trust was tenuous in prison, most women were able to identify at least one other prisoner as a trusted friend (also see Giallombardo, 1966). Emotional support, sharing, and trust were identified as key characteristics that allowed friendship relationships to develop among incarcerated women.

While studies of incarcerated men show that relationships are often foregone as a norm of "do your own time" and hypermasculine ideals, relationships and trust-building among incarcerated women are often an essential element of doing their time. For example, Crew and colleagues (2017) interviewed men and women serving life sentences in England and Wales' prison system. They asked respondents to rank the most significant problems they faced while

incarcerated. While women ranked "not feeling able to completely trust anyone in prison" as the 4th most serious problem they faced, this problem did not make men's top 10 list of ranked problems. Moreover, trust was identified as a reoccurring issue in the qualitative interviews with women, where they described the various ways that their trust has been broken or abused in the past resulting in the women being extremely cautious of trusting others (Crew, Hulley, and Wright, 2017).

In addition to the unique role that social support plays in the lives of incarcerated women, these studies highlight the importance of trust for extending access to information, goods and services, helping craft a sense of community (e.g., we are all in this together), and increasing feelings of safety and security within the prison environment (Adelman et al., 1987; Owen et al., 2017; Severance, 2005). To receive any of the benefits of trust, however, requires the ability to forge at least some trusted relationships with other prisoners (Jones, 1993). Nevertheless, the problem of discerning whom to trust persists, due to the very features of the carceral setting we have emphasized. As one prisoner interviewed by Severance (2005: 350) noted: "You don't know these people. We don't know why they are here. They'll tell you, but who's to say that's the real reason? You don't know these people." To better understand trust processes in prison and build upon the qualitative findings discussed above, we follow Kreager and colleague's (2016a, 2017) call to utilize a social network approach to measure and assess trust relationships in prison. This network approach is especially beneficial for carceral research as it provides a framework for operationalizing network configurations that pertain to specific hypotheses and provides future research with replicable results (Kreager et al., 2017).

**Theoretical Expectations**

In this section, we examine various explanations by which individuals form beliefs about the trustworthiness of others. We also derive hypotheses from each explanation and state these hypotheses in network terms. That is, we stipulate the hypotheses in regard to how a prisoner, *i*, would form a trust relationship with another prisoner *j* and the network configurations that would represent the hypothesized process. The strength of a network approach over past work on trust in correctional settings is that it provides a precise operational measure of each hypothesis and allows for systematic future replication across different prison contexts (Kreager et al. 2016a). A reading of prior literature provides some basis for predicting individual and structural characteristics that are associated with trust relationships. We organize this into three sections: 1) individual characteristics associated with trust, 2) the role of homophily in trust relations, and 3) network structural properties that influence trust among incarcerated women. We review this literature and propose hypotheses related to the formation of trust ties across these three sections.

***Age, Prison Tenure, Time on Unit, and Trust***

Similar to the popular notion that "age begets wisdom," in carceral settings, greater time spent in prison brings with it more experience, stability, and knowledge to draw upon and potentially share with others. Thus, it is not surprising that a recent study of incarcerated men in Pennsylvania finds that the most influential prisoners tend to be the "old heads" with many younger prisoners looking up to the more experienced prisoners for advice, help, and support (Kreager et al., 2017). Similar to findings for men, incarcerated women that have been in prison for a longer period may be viewed as "old heads" and trusted for their institutional knowledge, advice, and experience in a carceral setting. Similarly, more experienced prisoners may find themselves taking on a mother/grandmother role, offering advice and support to younger, less experienced prisoners (Jones, 1993). Finally, individuals who have spent more time on the unit may be perceived as more

trustworthy given than they "know the ropes" about unit operations and organization. These prior studies lead us to our first set of hypotheses: *i* is more likely to trust *j* if *j* is older (hypothesis 1a), has served more time in prison (hypothesis 1b), and has spent more time on the unit (hypothesis 1c).

### *Homophily and Trust*

Evaluations of trustworthiness may also depend on the truster and trustee having the same or similar characteristics, a phenomenon known as homophily (McPherson, Smith-Lovin, & Cook, 2001). Individuals who identify with a particular group may base their assessment of the trustworthiness of others on such shared group characteristics due to self-identification and homophily principles (Tyler, 2001). Trust may be demarcated by particular in- and out-groups such that the radius of trust (Fukuyama, 1995) is limited to within groups (Cook, Levi, & Hardin, 2009). Several characteristics may induce homophily in trust nominations, including religious affiliation and race.

#### *Religious Homophily and Trust*

Studies that examine the importance of religion for prisoner well-being often find that a significant proportion of prisoners rediscover or experience a religious conversion while incarcerated, often initiated by contact with more religious peers (Kerley & Copes 2009; Kerley et al., 2005; Wulf-Ludden, 2012). For instance, Wulf-Ludden (2012) indicates that prisoners in his sample reported the importance of peers for helping them understand and practice religious/spiritual issues and, in turn, become better people. Religious practice, therefore, is likely to promote trust as it allows bonding through the shared interest, experiences, and beliefs of the group's members through engagement with like-minded faith followers (Putnam & Campbell, 2010). This leads us to our second hypothesis: *i* is more likely to trust *j* if *j* is the same religious

affiliation as *i*.

*Racial Homophily and Trust*

A salient topic in prison research is the role of race in shaping social relationships. In an analysis of prison gangs, Skarbek (2014) argues that race acts as a credible signal (see Gambetta, 2009) that distinguishes between gangs to facilitate the production of governance institutions that regulate violence. However, because there is a shortage of credible signals, race, a hard to fake signal, becomes a device for determining who is trustworthy and who is not. The resulting structure is one where there are racial cleavages due to the inability to create signals of trustworthiness independent of one's race. Using sociometric "get along with" relationships (an approximation of the concept "friendship") among 205 incarcerated men in a good behavior unit in Pennsylvania, Schaefer et al. (2017) found strong support for racial/ethnic homophily in that clusters in the network tended to be grouped by race/ethnicity. Although these studies suggest that race significantly structures interaction among incarcerated men, there is much less evidence that it does so among women (Kreager & Kruttschnitt, 2018). Overall, research suggests that women's prisons exhibit less racial division than is the case in men's prisons, with kinship and friendship ties being likely to span racial differences in women's prisons (Giallombardo, 1966; Kruttschnitt, 1983; Owen, 1998). In their longitudinal study of the California Institution for Women (CIW), for instance, Kruttschnitt and Gartner (2005: 91) found that "despite women's alienation from and suspicion of others, serious violence, racial conflict, and gang activity were rare …" Overall, this body of research suggests that racial homophily in trust relationships will not be evident among our sample, leading us to our third hypothesis: *i* is no more likely to trust *j* if *j* is the same race/ethnicity as *i*.

***Network Structural Properties and Trust***

In addition to the role of prisoner characteristics and homophily shaping trust relationships, we consider the role of three additional network structural properties: entrainment, embeddedness, and brokerage. As we did in the prior section, we stipulate the hypotheses derived in this section in regard to how a prisoner, *i*, would form a trust relationship with another prisoner *j* and the network configurations that would represent the hypothesized process.

*Entrainment and Trust*

As has been discussed, trust appears to be a critical component of friendships among incarcerated women. Although the women in Crewe and colleague's (2017) study longed for intimacy and viewed trust as an essential component of the type of friendships desired, they expressed great anxiety about extending trust to other prisoners. While prior work suggests that declining trust is in part responsible for lower investment in relationships in women's prisons today, compared to the past, almost all studies note that most women were able to identify at least one close friend whom they trusted (Giallombardo, 1966; Greer, 2000; Kruttschnitt, Gartner, & Miller, 2000; Severance, 2005). A common theme emerging from these studies is that incarcerated women emphasize the importance of emotional support, sharing, and trust as essential components of the type of friendships they desire. Based on this literature, we anticipate that women will be more likely to send trust ties to other women whom they are close to and to women with whom they have existing friendships. In structural terms, this process is one where ties between two networks may co-occur, a configuration known as *entrainment* (see Robins & Lusher, 2013: 28). That is, the network of friendships may facilitate trust, leading these network ties to co-occur, or to "grow-together" as the concept of entrainment entails. This leads us to our fourth hypothesis: *i* is more likely to trust *j* if *i* gets along with *j*.

*Embeddedness and Trust*

In situations in which individuals know each other, relationships that form and influence trust are said to be *embedded* (Coleman, 1990; Granovetter, 1985). Buskens (2002) and Buskens and Raub (2002) distinguish between two types of embeddedness: dyadic and network (see also Granovetter, 2017 who uses the terms *relational* and *structural* to identify similar constructs) *Dyadic embeddedness* involves a reciprocal process by which individuals exchange information about the trustworthiness of each other. The exchange results in a mutual trust relationship where prisoner *i* is more likely to trust prisoner *j* because *j* trusts *i*. This leads us to our fifth hypothesis: *i* is more likely to trust *j* if *j* trusts *i*.

*Network embeddedness* refers to the situation where an individual may learn about the trustworthiness of another through a third-party as opposed to the direct communication that occurs with dyadic embeddedness. For example, *i* may trust *j* because of information received through interpersonal discussion of *j* through a third-party, *k*. In this way, information about the trustworthiness of another person is received indirectly. Our sixth hypothesis states that: *i* is more likely to trust *j* if a) *i* trusts *k* and *k* trusts *j* and b) *k* gets along with *i*. The logic of this hypothesis is that *i* is more likely to trust *j* because a) *i* trusts a third-party, *k*, who trusts *j* and b) the third-party, *k*, shares information about *j* with *i* through a separate network relation (i.e., the get along with network). To contextualize this hypothesis, consider a study by Burt and Knez (1995) in which they studied the role of gossip for communicating information about the trustworthiness of others. In particular, gossip was seen as a device for transmitting information through the telling of "stories," some of which involved the recounting of events containing information about the trustworthiness of other individuals. In this situation, third-parties provide an important conduit for providing trust-relevant information about lesser-known others. When individuals have trusting relationships, they are more likely to tell more detailed stories about those persons to others,

increasing the perceived trustworthiness in the eye of others (Burt & Knez, 1995).

*Brokerage and Trust*

Whereas embeddedness is concerned with the nesting of individuals in dyadic and third party structures, brokerage concerns itself with the absence of such structure. An extensive literature has sought to understand how an individual's relative position to others may yield advantages. In particular, the fact that networks are often characterized by clusters of groups connected by a few relationships, or structural holes (Burt, 1992), suggests that information and various resources may not diffuse efficiently, resulting in groups having limited contact with one another. The literature on bridging capital, spanning structural holes, brokerage, or weak ties indicates that individuals with relationships that connect otherwise disconnected groups may be more likely to gain advantage from their position (see Stovel & Shaw, 2012; Burt, Kilduff, & Tasselli, 2013 for reviews). Also, the extent to which individuals broker relationships may have implications for whether they are perceived as trustworthy, as well as their own level of trust in others. On the one hand, individuals in brokerage positions may be more likely to trust others (Barr, Ensminger, and Johnson, 2009). Relative to those in more redundant networks, brokers are structurally positioned to gain more by establishing trust relationships. This is because brokered relationships provide valuable resources that are not available among redundant ties. This leads us to our seventh hypothesis: *i* is more likely to trust *j* as *i*'s brokerage in the get along with network increases.

On the other hand, individuals in brokerage positions may be less likely to *be* trusted by others. Individuals who occupy positions that are interstitial to groups may be viewed with suspicion and have their group loyalty questioned, thereby undermining trust assessments (see Kramer, 1999, for a review). As individuals form beliefs about whether someone will take action

on their behalf, it may be difficult to form accurate perceptions about the potential actions of persons who occupy positions that span structural holes. That is, due to their position, it may be hard to evaluate where their commitments lie. In particular, situations involving disputes between parties may be riddled with uncertainty about how an individual who occupies a brokerage position will behave in the future. This leads us to our eighth hypothesis: *i* is less likely to trust *j* as *j*'s brokerage in the get along with network increases.

***Summary***

Knowing whether and how incarcerated women establish relationships of trust with one another is crucial for understanding how individuals adjust to conditions of confinement, yet we know very little about how trust is *organized* in prisons. This dearth of knowledge stems from a lack of conceptual work on the concept of trust in corrections, specifically and criminology in general. In seeking to contribute to the growing area of research that Kreager et al. (2016a) refer to as the "Criminology of Inmate Networks" (see also Kreager et al. 2017; Schaefer et al. 2017), the current study utilizes a social network approach and measures to examine the relationship of trust ties among incarcerated women housed in a PA prison unit. We do so by examining the role of individual and structural determinants of trust in this prison unit and evaluating hypotheses concerning the organization of trust relationships in a women's prison. Our hypotheses have been presented in three sections: 1) individual characteristics associated with trust, 2) the role of homophily in generating trust relations, and 3) network structural properties that potentially influence trust. We stipulated these hypotheses regarding how a prisoner, *i*, would form a trust relationship with another prisoner *j* and the network configurations that would represent the hypothesized process. To visualize and reiterate these hypotheses, the network configurations pertaining to each hypothesis are shown in Table 1. The strength of a network approach over past

work examining trust in carceral and other settings is that it allows for much more precise operational measures of our trust-related hypotheses. Just as important, the precise specification of context allows our findings to be replicated in other settings, something that has not been possible in past research (Kreager et al. 2016a).

--- Table 1 about here ---

**Data**

Data for this study come from the Women's Prison Inmate Networks Study (WO-PINS). WO-PINS examines the informal organization within two Pennsylvania women's prisons. The current study focuses on the first data collection site, completed in the summer of 2017, of a "good behavior" unit in a minimum-security women's prison (i.e., residents were required to be misconduct-free before entry and remain misconduct-free during their residence). The unit had a maximum capacity of 135 prisoners housed in a separate building within the prison. Women were held in six-person rooms laid out on a single floor with a dayroom and guard desk at the midpoint. Researchers administered computer-assisted personal interviews (CAPI) surveys to respondents in face-to-face interviews over approximately one hour. At the time of data collection, there were 131 residents on the unit, of which 104 (79%) participated in the in-prison survey. In addition, one individual was omitted because she failed to demonstrate the capacity to consent during an initial screening tool. Therefore, this individual's responses could not be used in the analysis. This left 103 (78%) respondents with valid survey data (from which the network measures are obtained). We discuss strategies for handling non-response and missing data below. The WO-PINS data examined in this study stem from two sources. First, the in-person survey collected peer nomination data for relational ties central to this study's analyses. Second, the PA Department of

Corrections (PADOC) provided administrative data for all unit residents. This data included demographic, sentence characteristics, and movement records for all prison stays.

## Measures

### *Network Measures*

#### *Trust Network*

During the CAPI administration, respondents were shown a roster of all women on the unit and asked to indicate, "Who are the residents that you trust to support you during an argument or dispute with another inmate?" Each respondent was allowed to nominate as many others as they wished from a unit roster. This measure of trust reflects Hardin's (2002) three-part conceptualization, where A trusts B to do X. In this case, *i* trusts *j* to support *i* during an argument or dispute. In addition, this measure captures a salient feature of confinement for women as research demonstrates that verbal and emotional aggression occurs with regularity (see Kreager & Kruttschnitt, 2018: 270). There were a total of 515 trust nominations made by the 103 women in the unit, resulting in a density of 0.07. Trust nominations are directed, meaning that a trust nomination from *i* to *j* does not necessarily reflect a trust nomination from *j* to *i*. The number of trust nominations that an individual receives measures their relative trustworthiness, and the number of trust nominations that an individual sends measures their relative trust in others.

#### *Get Along With Network*

In addition to trust, we collected data on friendships by asking respondents which other residents on the unit they "get along with most." This item is akin to friendship in that it represents with whom women tend to spend their time.[1] This approach has been used in prior studies of

[1] We chose not to ask about friendship itself given that some prisoners are adamant about not having "friends" in prison, only "associates" (Crewe, 2009).

prisoner social networks (see Kreager et al., 2017; Schaefer et al., 2017).

*Embeddedness*

*Dyadic embeddedness* is operationalized as the presence of mutual ties in the trust network (i.e., reciprocated trust). That is, a mutual structure exists if *i* trusts *j* and *j* trusts *i*. *Network embeddedness* is a more complex measure and uses both the trust network and the get along with network. Recall that the logic of this measure is that *i* is more likely to trust *j* because a) *i* trusts a third-party, *k*, who trusts *j* and b) the third-party, *k*, shares information about *j* with *i* through the get along with network. The cells in this matrix[2] represent the number of two-paths in the trust network between *i* and *j* (i.e., *i*—>*k*—>*j*) in which there is also a get along with network tie from *k* to *i*.

*Brokerage*

To measure brokerage in the get along with network, we perform the Gould and Fernandez (1989) brokerage analysis. A broker is someone who occupies a position such that the individual, *i*, mediates contact between two other individuals, *j* and *k*. Specifically, our measure of brokerage is the total number of two-paths in the get along with network between *k* and *j*, where *i* occupies a middle position (i.e., *k*—>*i*—>*j*) and *k* and *j* are not directly linked. We then take the log of this measure to minimize the influence of outliers (see Koskinen et al., 2018). Individuals with higher values of brokerage in the get along with network occupy more positions that are interstitial between groups.

***Individual Attribute Measures***

*Age, Time in Prison, Time on Unit, Religion, and Race*

[2] Specifically, we first construct a matrix representing the number of two-paths from *i* to *j* where a two-path is defined as a tie from *i* to *k* and a tie from *k* to *j* in the trust network. This matrix is constructed by squaring the trust network. This two-path matrix is then multiplied by the transpose of the get along with matrix. The product matrix is the network embeddedness measure.

We measure *age* in years, *time in prison* as the total number of years that the individual has been incarcerated in her lifetime, and *time on unit* as the number of years that the individual has been in the specific unit. *Religion* is a categorical measure based on individual self-reported religious affiliation (Muslim, Christian [Catholic and Protestant combined], Other, or None). We include measures of the respondent's *race/ethnicity* (White/Other, African-American, Hispanic). In addition, we include controls for victimization prior to prison, offense gravity score, type of offense, and IQ, but exclude them from the analyses presented below as each showed trivial effects. The descriptive statistics for all the measures are shown in Table 2. Table 2 also lists the measure of association (*t*-score for binary variables, *r* correlation coefficient for continuous variables) for each variable with the indegree and outdegree for trust. The last column of Table 2 shows the measure of network autocorrelation (odds-ratio for binary variables, Moran's I for continuous variables) where higher values indicate greater homophily for a variable.

--- Table 2 about here ---

**Analytic Approach**

We evaluate whether certain personal characteristics and network structural configurations are associated with trust nominations by applying exponential-family random graph models (ERGMs) to the unit's trust network (Frank & Strauss, 1986; Holland & Leinhard, 1981). ERGMs formulate the probability of observing a network given a set of nodes and their attributes. An extensive literature exploring and discussing the model class exists (Robins et al., 2007; Snijders et al., 2006; Wasserman & Pattison, 1996), and criminological examples are also available (e.g., Young, 2011). A powerful feature of ERGMs is their ability to account for the endogenous and

mutually dependent nature of ties. This means that predictors can include not only nodal attributes, but also dyadic and triadic properties (Koehly, Goodreau, & Morris, 2004).[3]

***The ERG Model***

Social network data consist of pairwise relationships among actors and the attributes of those actors. A social tie is regarded as a random variable, $Y_{ij}$, where $Y_{ij}$ =1 if there is a tie between actor *i* and actor *j* and $Y_{ij}$ =0 if there is not a tie. An observed value of the random variable $Y_{ij}$ is denoted as $y_{ij}$. Ties between actors can be represented by an *n* X *n* matrix, **Y**. The ERG model is subsumed under a 'model-based' framework in that the observed network is treated as a realization from a stochastic process. In this context, interest focuses on making inference about the parameters that generate the social network observed. Model-based random networks allow specification of characteristics (e.g., network shape, nodal attributes), which can then be simulated. As with regression, the characteristics of interest are specified, and an observed network is used to estimate the strength of the effects of the characteristics.

The ERG model formulates the probability of observing a set of ties as *y* given a set of actors and their attributes as:

$$P(\mathbf{Y} = y \mid n \text{ actors}) = \frac{\exp\left(\sum_{k=1}^{K} \theta_k z_k(\mathrm{y})\right)}{c} \quad (1)$$

The $z_k(y)$ terms represent model covariates, which are any set of *K* network statistics calculated on *y* and hypothesized to affect the probability of this network forming. The $\theta$ coefficients determine the impact of these statistics and are estimated from the data. The denominator *c* is a normalizing constant that constrains the probabilities to sum to 1. Eq. (1) can be re-expressed as the conditional log-odds (logit):

[3] Models are estimated and goodness-of-fit is evaluated using the *ergm* package (Handcock et al. 2019; Hunter et al. 2008) in *R*. Goodness-of-fit indices are available in the online supplement.

$$\text{logit}\left(P\left(Y_{ij}=1 \mid n \text{ actors}, Y_{ij}^{c}\right)\right)=\sum_{k=1}^{K}\theta_{k}\delta z_{k}(y) \quad (2)$$

where *Yᶜij* denotes all dyads other than *Yij*, and δ*zk*(*y*) is the amount by which *zk*(*y*) changes when *Yij* is toggled from 0 to 1. The logit formulation clarifies the interpretation of the $\theta$ vector: if forming a tie increases *zk* by 1, then *ceteris paribus* the log-odds of that tie forming increase by $\theta$. The inclusion of *Yᶜij* in the conditional reflects the mutual dependence of ties. As such, Eq. (2) describes a *dyadic dependence* model because tie formation is endogenous to the model. This property distinguishes the model from a traditional logistic regression because the network is not simply the outcome of nodal attributes. In dyadic dependence models, the likelihood is poorly estimated by maximum likelihood, but Markov chain Monte Carlo (MCMC) provides a means of approximating the likelihood with the important implication that a sample of networks can be simulated from the algorithm providing a means of examining model fit. As a result, goodness-of-fit can be assessed by comparing the networks simulated from the estimated model with the observed network.

In addition to the $\theta$ coefficients, we present the average marginal effects (AMEs)[4], where the AME is the average change in the probability as a variable increase by 1 (Long and Mustillo, 2018). According to Duxbury (2019), the AMEs of the estimates in an exponential random graph model provides a better interpretation of effect sizes because (1) they do not change conclusions about significance (i.e., the *z*-statistic is the same as the coefficient *z*-statistic), (2) they are calculated on an additive, rather than multiplicative scale, as are odds ratios, and (3) they are calculated on the more intuitive scale of tie probabilities. To facilitate interpretation of the

[4] Average marginal effects and predicted probabilities are calculated using the *ergMargins* package (Duxbury, 2019).

estimates, we visualize the change in the conditional probability of a tie based on representative values of a variable (i.e., mean, +/- 1 standard deviation). The AMEs and the visualization of the change in conditional probabilities aid in understanding the substantive significance of the results.[5]

***ERG Model Specification***

Trustworthiness is assessed through a series of *receiver* effects that evaluate the likelihood of an $i \rightarrow j$ trust tie conditioned upon $j$'s value on a given attribute. For example, hypotheses 1a, 1b, and 1c (see Table 1) indicate that receiving a trust nomination is dependent on age, time in prison, and time on unit. Thus, we would expect women with higher values of these attributes to receive more trust nominations from other residents (i.e., have a higher indegree) relative to women with lower values of the attribute. According to hypotheses 2 and 3, women are also more likely to nominate other residents as trustworthy if the other residents are more similar to themselves (i.e. *homophily*). Homophily is measured using a *match* effect to indicate whether or not $i$ and $j$ are identical on the attribute (yes=1, no=0). We examine hypothesis 4, that women are more likely to trust other residents if they identify them as someone they get along with, by including an *edge covariate* effect, representing whether the probability of an $i \rightarrow j$ trust tie is dependent on the presence of an $i \rightarrow j$ tie in the get along with network. The network configurations used to test the embeddedness hypotheses (i.e., hypothesis 5 and 6) are a *mutual* term (i.e., the probability of an $i \rightarrow j$ trust tie depends on a $j \rightarrow i$ trust tie) and an *edge covariate* effect representing whether the probability of an $i \rightarrow j$ trust tie is greater when there is a two-path in the trust network between $i$ and $j$ (i.e., $i \rightarrow k \rightarrow j$) and also a get along with network tie from $k$ to $i$. Finally, to test the brokerage hypotheses, *sender* and *receiver* effects for $i$'s log brokerage score are specified for hypotheses 7

[5] We than an anonymous reviewer for suggesting we calculate the conditional probabilities to better communicate the substantive effects of our results.

and 8, respectively. The *sender* effect evaluates whether *i* is more likely to send a trust tie to *j* conditional on *i*'s brokerage value in the get along with network. The *receiver* effect evaluates whether *i* is more likely to receive a trust tie from *j* conditional on *i*'s brokerage value in the get along with network.

We also include *sender* effects for age, time in prison, and time on unit, as well as *sender* and *receiver* effects for religious affiliation and race/ethnicity to control for difference in the degree distributions over these attributes. Finally, we include controls for homophily for age, time in prison, and time on unit using *absolute difference* terms. This term is an inverse indicator, as it accounts for the probability of a tie to increase as the difference on a continuous attribute between *i* and *j* declines (thus homophily is indicated by a negative coefficient). Finally, following best practices established in the literature, we also include structural terms representing common interdependencies between dyads.[6]

***Missing Data***

ERGM estimation is sensitive to missing data (Wang et al., 2016). Of the 131 residents in the unit, 104 (79%) completed the survey instrument, and one individual who was flagged as having a mental illness code failed to pass the informed consent test. This left 103 (78%) respondents with survey data and valid outdegree trust data. Because trustworthiness is operationalized using incoming ties, trustworthiness could still be measured for individuals who did not take the survey (since they could still be selected by other women in the unit as someone

[6] To control for the tendency of some individuals to receive more ties and send more ties, we take into account the *indegree distribution* and the *outdegree distribution*, as research indicates that failure to do so may overestimate effects of attributes on receiving ties (Lusher & Ackland, 2011). We parameterize the degree distributions using the geometrically weighted indegree (GWIDEGREE) and outdegree (GWODEGREE) effects (Hunter, 2007). *Two-path* counts the number of configurations where there is a tie from *i* to *k* and a tie from *k* to *j* in the trust network. *Triadic closure* captures the likelihood of an $i \rightarrow j$ tie, conditional upon the number of *k* prisoners for which $i \rightarrow k$ and $k \rightarrow j$ ties also exist. *Cyclical closure* captures the likelihood of an $i \rightarrow j$ tie, conditional upon the number of *k* prisoners for which $k \rightarrow i$ and $j \rightarrow k$ ties also exist. We parameterize triadic closure and cyclical closure using the geometrically weighted edgewise shared partner (GWESP) effects (Hunter 2007; Hunter & Handcock, 2006).

they trust). As a consequence, these individuals provide important information and are retained for this analysis. The 27 non-respondents and individual excluded due to being diagnosed with a serious mental illness have valid incoming ties (i.e., the number of times they were identified as a trusted person by other women included in the data), but are missing data for their (survey-reported) out-going ties and other background attributes. We estimate the ERGMs using a model that restricts the set of networks from which the observed data are stochastically generated to those where non-respondents have outdegree scores restricted to zero.

## Results

### *Descriptive Analysis*

We begin our analysis of the data by describing the prevalence of trust in the unit. Recall that we emphasized that trust is risky in prison, yet it may be beneficial, providing a valuable resource for women during their incarceration. Yet, how likely is it that incarcerated women actually trust one another? Table 2 indicates that the average respondent received (i.e., indegree) 3.93 trust nominations (sd = 3.02), whereas the average ties sent among the 103 eligible survey respondents (i.e., outdegree) was 4.08 (sd = 6.14). This indicates that, on average, a woman was viewed as trustworthy (in the context of providing support to another woman involved in an argument or dispute) by nearly 4 people on the unit. Both trustworthiness and trust varied considerably among women. For example, 13 individuals received 0 trust nominations, suggesting that nearly 10% of the unit was not trusted by anyone to support them during a dispute. Of those who could make nominations, 22 (21%) indicated that they did not trust anyone to support them, whereas 2 women indicated that they trusted as many as 35 women to support them during a dispute. Keeping in mind that respondents were allowed to nominate as many other women as they

wished, the descriptive statistics indicate that trust is fairly low on this unit with respect to the context of support during a dispute. For a unit with 131 women, the average person only trusted about 3% of the unit.

Table 2 shows the relationship between the measures of interest and the trust and trustworthiness assessments. Beginning with indegree, or nominations of who is trustworthy, older individuals who have spent more time in prison and who have spent more time on the unit are seen as relatively more trustworthy. For religion, those who indicate no religious affiliation have lower trustworthiness, and those who indicate a religious affiliation other than Christian or Muslim have higher trustworthiness. For race, white and Hispanic individuals are seen as more trustworthy relative to black individuals. Regarding the effects of the get along with network, individuals who broker relationships in the get along with network are more likely to receive trust nominations. Additionally, individuals who send more trust nominations are more likely to receive trust nominations. Moving on to outdegree, or who is more likely to trust, individuals are more likely to send a trust nomination if they indicate a religious affiliation other than Christian, Muslim, or None, if they are Hispanic, if they broker more positions in the get along with network and receive more trust nominations. Finally, the measures of homophily indicate that there is some evidence that homophily occurs for age, time in prison, religion, and race/ethnicity.

--- Table 3 about here ---

A visualization of the trust network is shown in Figure 1. In this figure, nodes are colored by race/ethnicity (White= Red; African American = Blue; Hispanic = Green), shaped by religious affiliation (Triangle = Christian; Muslim = Square; None = Pentagon; Circle = Other), and sized

proportional to in-degree centrality (i.e. larger nodes received more trust nominations). The visualization aids in illustrating the descriptive aspects of the network described above. Keep in mind that the bivariate differences of mean comparisons and correlations shown in Table 2 and the visual representation of the trust ties in Figure 1 are simple descriptive tools. To better understand the processes that generated the observed network, we now move to the inferential analysis to test our hypotheses.

--- Figure 1 about here ---

***Inferential Analysis***

Table 3 shows the ERGM estimates predicting trust as well as the average marginal effects (AMEs), which reflect the percentage change in the probability of a tie for a 1 unit increase in the predictor variable. Compared to a network where ties form at random, the structural terms show that there are fewer two-path structures, there is more transitive closure, and there are fewer cyclical triads in the network. Together, these terms indicate a tendency toward hierarchical structures where a few individuals receive a higher proportion of nominations. Moving to the evaluation of our hypotheses, the terms for age (hypothesis 1a), time in prison (hypothesis 1b), and years on unit (hypothesis 1c) reveal no support for our first set of hypotheses. Specifically, none of the receiver effects are significantly different from zero, suggesting that *i* is no more likely to trust *j* if *j* is older, has served more time in prison, and/or has spent more time on the unit. Additionally, the table indicates that older individuals are less likely to trust other prisoners, and those who have spent more time on the unit are more likely to send trust nominations. Also, there is some evidence of homophily for time on the unit such that individuals who are more similar in how long they have been in the unit are more likely to trust each other.

For hypotheses 2 and 3, we also find mixed support. Regarding the second hypothesis, we find evidence of religious homophily for women identifying as Muslim and for those who indicate no religious affiliation. Women with these particular religious backgrounds are more likely to send trust ties to other women who have the same religious affiliation. Specifically, the average marginal effect (AME) shows that the probability of a trust tie increases by 4.31% if *i* and *j* are both Muslim compared to the situation where either *i* or *j* are not Muslim. The AME for no religious affiliation shows that the probability of a trust tie increases by 4.49% if both *i* and *j* are not religiously affiliated. There is no evidence supporting religious homophily for women identifying with other religious backgrounds.

Consistent with our third hypothesis, the racial homophily terms are not significantly different from zero, indicating that *i* is *no more likely* to trust *j* if *j* is the same race/ethnicity as *i*. Consistent with prior research finding little racial cleavage in women's prisons, this result indicates that women of similar racial/ethnic identities are no more or less likely to trust other women of similar racial/ethnic identities. Conditional on the differences in tie sending and receiving by race/ethnicity, and the other network configurations, we see that the observed bivariate homophily for race/ethnicity in Table 2 is a consequence of other processes.

For hypothesis 4 examining entrainment, we see strong evidence that *i* is more likely to trust *j* if *i* gets along with *j*. Specifically, the probability of a trust tie increases by 5.58% if *i* gets along with *j*, indicating that there is strong support for the claim that these two networks are entrained. Consistent with prior work situating trust as a key component of friendships among incarcerated women, the participants in our study are more likely to trust those with whom they get along with.[7]

[7] The graph correlation between the trust network and the get along with network is only 0.4, suggesting that there are a nontrivial amount of dyads for which either a get along with tie *or* a trust tie exists, but not both.

Also, consistent with the idea that trust and friendships are closely intertwined for incarcerated women, we find strong evidence that trust ties are reciprocated, supporting hypothesis 5. In other words, trust ties are dyadically embedded in this network. The probability of a trust tie between *i* and *j* increases by 2.34% if *j* has also indicated that she trusts *i*. As for hypothesis 6, we also find strong support in that the probability of a tie between *i* and *j* increases by 1.63% if a) *i* trusts *k* and *k* trusts *j* and b) *k* gets along with *i*.

Finally, for the analysis of brokerage in the get along with network (hypotheses 7 and 8), recall that the two hypotheses were: individuals with greater brokerage scores in the get along with network are more likely to trust others (hypothesis 7 focused on the willingness to trust) and individuals with greater brokerage in the get along with network are less likely to be trusted by others (hypothesis 8 focused on being viewed as trustworthy). We do not find support for hypothesis 7 and the idea that greater brokerage translates into higher levels of trust. On the contrary, the estimate indicates that individuals who broker relationships in the get along with network are *less* likely to trust others. Specifically, for a 1 unit increase in the log brokerage score, the probability of sending a trust tie declines by .37%. Thus, as individuals increasingly occupy positions of greater brokerage in the get along with network, they are less likely to trust others. We also do not find support for the hypothesis that greater brokerage translates into lower trustworthiness (hypothesis 8). Although the coefficient is in the hypothesized direction, the effect is fairly weak and not significantly different from zero. Thus, women occupying brokerage positions in the network are no more or less likely to be trusted.

--- Figure 2 about here ---

The results above showed mixed support for the hypotheses we proposed. To further understand the substantive significance of our findings, we examine the conditional probabilities. The coefficients in Table 3 represent the probability of a tie and can be converted to an interpretable metric by the usual calculation for logistic regression (see Harris, 2014, for an introduction). Specifically: $\frac{1}{1+e^{-(\theta*\delta)}}$, where $\theta$ represents the estimated coefficient and $\delta$ represents a "change statistic," indicating how the variable of interest changes (e.g., toggled between 0 and 1 for a binary variable). Figure 2 plots the conditional probabilities for each of the estimates from Table 3 based on the mean (the diamond symbols) and +/- 1 standard deviation (the upward facing and downward facing triangle symbols, respectively). The grey estimates are those that are not significantly different from zero, and the blue and red estimates correspond to positive and negative signed coefficients, respectively. Finally, the brackets show the effect of a standard deviation change from the mean in terms of the change in the probability of a tie. The wider the segment, the more substantial the effect of a change in the variable on the conditional probability of a tie.

Overall, the figure shows that the network structural properties are stronger predictors of trust than individual attributes. For example, the strongest effect is for the entrainment effect (hypothesis 4), where the conditional probability of a tie increase by 0.18 for a 1 standard deviation increase from the mean. The next strongest effect, though substantially weaker, is the sender effect of brokerage (hypothesis 8) where the conditional probability of a tie decreases by 0.08 for a 1 standard deviation increase from the mean. The embeddedness effects show that the probability increases by 0.05 for a standard deviation increase from the mean for both dyadic (hypothesis 5) and network embeddedness (hypothesis 6). The effects for religious homophily (hypothesis 2) are the weakest effects showing that the probability of a tie increases by 0.04 for homophily among Muslims and among those who are not religiously affiliated.

## Discussion

A large body of research illustrates the benefits of trust for individuals, organizations, and countries (e.g., Smith, 2010). At the individual-level, having trusted relationships is associated with better health and well-being (Ward & Meyer, 2009). Of course, misplaced trust also brings potentially severe detrimental consequences, and hence individuals must carefully weigh the potential risks and benefits of placing trust in another. As we argue in this paper, the prison environment provides a compelling and unique context to evaluate the prevalence and correlates of trust ties among prisoners. Although incarcerated women have great concern about the trustworthiness of other prisoners and the risks of misplaced trust, there is also a tremendous need for social support, and most incarcerated women form at least some trusted ties with other prisoners (Severance, 2005).

Knowing how individuals respond to the peculiar situations of establishing trust in prison is crucial for understanding how individuals adjust to conditions of confinement. However, existing research provides few answers. As Clarence Shrag (1954: 37) stated over 60 years ago, "Failure to investigate more thoroughly the dynamics of interaction among prison prisoners may be a serious theoretical and methodological omission in criminological research." Decades later, Kreager and Kruttschnitt (2018: 262) reiterate this call, noting the continued lack of research focused on contemporary inmate society within US prisons and the fact that "inmate social organization remains opaque." Following the lead of Kreager et al. (2016a) (see also Kreager et al. 2017; Schaefer et al. 2017), we have sought to contribute to the "Criminology of Inmate Networks" by examining the relational structure of trust in a women's prison unit. Our unique contribution to this growing area of research was to address a dearth of knowledge on the

conceptualization and measurement of trust in corrections specifically, and criminology in general, by conceptualizing trust as a three-part relation where A trusts B to do X (Hardin, 2002) and thereby moving toward a relational perspective of trust (see Cook, 2005). Framed in this way, our relational approach allowed us to ask several novel questions: Do incarcerated women trust other prisoners to support them during disputes? If so, who is more likely to trust others, and who is more likely to be trusted? To address these questions, we derived hypotheses from prior research on trust in corrections as well as outside of criminology. Overall, our study has three primary findings that advance our understanding of the way trust is *organized* in a women's prison unit.

First, we found no support for the idea that trust mainly varies by individual characteristics such as age, prison tenure, and time on the unit. While some work has shown that more experienced prisoners may find themselves offering advice and support to younger, less experienced prisoners (Jones, 1993), we found that these characteristics did not play a role in shaping who was viewed as trustworthy for providing support during a dispute. We did, however, find fairly weak evidence that these characteristics played a role in shaping whether individuals report trusting others (i.e., outdegree behavior). Nevertheless, these characteristics do not appear to be the main drivers of decisions about whom to trust for providing support during a dispute with another prisoner. Furthermore, preliminary analyses not presented here examined the effects of victimization prior to prison, offense gravity score, type of offense, and IQ, but also showed trivial effects on the likelihood of trusting or being trusted by others.[8] Overall, our findings show that trust, at least in terms of views about who will support you during a dispute, is more complex and goes beyond variation in the individual characteristics we identified.

[8] It may be the case that women were interpreting our measure of support as reflecting physical violence. As such, we might expect that physique would predict trust. To check whether this was the case, we examined whether BMI, a measure of exercise frequency, and an interviewer report of how muscular the respondent appeared. These measures were not associated with trust nominations.

Second, religious homophily appears to play a mixed role in shaping who one trusts to support her during a dispute. Specifically, we found that Muslim women and women who indicated no religious affiliation were more likely to trust each other when they shared these religious affiliations as opposed to someone of a different religious affiliation. In contrast, women who identified as Christian (either Catholic or Protestant) did not show any preference for trusting others of a particular faith. It is important to note that this lack of homophily among women who identify as Christian holds if separate effects are estimated for Catholic and Protestant religious affiliation. The effects for differential homophily we observe may also reflect the disproportionate representation of those who identify as Christian in the unit. As shown in Table 1, 82% of the women in the unit identified as Christian, and the effects for the two other groups (i.e., Muslim [7%] and None [6%]) may reflect the small size of these groups. That is, in situations where one is a minority, this characteristic may be particularly salient and drive one's beliefs about whom to trust in a specific context. In addition to the findings for religious affiliation, we find no evidence of racial homophily. Although studies suggest that race significantly structures interaction among incarcerated men, there is much less evidence that it does so in women's prisons (Kreager & Kruttschnitt, 2018), and our results support prior research in this regard.

Third, our findings regarding network structural properties are, for the most part, quite strong. Specifically, our results suggest that the get along with network (our proxy for "friendship") is entrained with the trust network and that, additionally, trust relations are embedded (in both dyadic and network forms). These results make sense when one considers the context for making inferences about who will support you during a dispute. In situations in which individuals know each other, relationships that form and influence trust are said to be *embedded* (Granovetter, 1985), and we show evidence of a close correspondence between the get along with network and

the trust network.

Our findings also contradict existing work on brokerage in networks. For instance, we found that individuals are *less* likely to trust others when they broker positions in the get along with network. While existing work points to the differences in potential gains for brokers (e.g., Burt, 2004), our results appear to highlight the difficulty prisoners face in choosing who is trustworthy when an individual brokers between groups. From the perspective of the broker, individuals who are interstitial between groups may not know who would support them during a dispute as a consequence of their position in the get along with network. Put differently, the mere nature of being in this brokerage position may make such a decision quite difficult and littered with uncertainty. However, while individuals in a brokerage position do not gain the trust of others, they may be strategically positioned to gain access to resources. That is, some individuals may seek to develop relationships for instrumental purposes such that these connections provide individual utility. Decisions based on expected utility may inherently conflict with others' beliefs about the trustworthiness of that individual.

Several limitations of the current study require attention. First, our data are restricted to a single unit with fairly low levels of problematic behavior (although the unit contains residents with a wide variety of offenses including very serious violent offenses and women serving life sentences), which may limit the generalizability to larger, more restrictive custody units. With that said, our estimate that the average women only trusted about 3% of the women on their unit is quite consistent with descriptive findings on the low prevalence of trusted relationships and the difficulty establishing them reported in some smaller qualitative studies of incarcerated women (e.g., Crewe et al., 2017; Greer, 2000; Severance, 2005; Tramell, 2009, and see Kruttschnitt et al., 2000). Also, consistent with these prior studies is the finding that most women on the unit we

examined were able to identify at least one person they could trust, with the average women trusting about nearly 4 residents on their unit. As with any study, however, the robustness of the findings to more general settings requires further empirical analysis.

Second, our measure of trust was specific toward situations involving "support during a dispute." Although we argue that this definition of trust is particularly applicable to a prison setting where conflict and disputes occur regularly, and the need for support from a trusted other is critical for well-being, we were unable to assess trust in other dimensions (e.g., trusting someone to keep a secret). However, the precision of our measure allows us to, at least, identify the radius of trust (Fukuyama, 1995), a problem that plagues other conceptualizations of trust. When a respondent indicates that they trust other people or trust other groups, what exactly do they trust them to do? In other words, where are the boundaries for this trust? Are those the same boundaries that another respondent would impose? This is the radius of trust problem and has been identified as a major weakness of typical measures of trust (see Hu, 2017 for a discussion). Whether our findings hold in other contexts is an empirical question for future research that should identify salient areas in which an individual may be concerned about trust (e.g., keeping a secret).

Third, as mentioned in the methods section, 27 of the 131 residents in the unit did not respond to our survey. If individuals who are less (or more) trusting are less likely to respond, then we would not have an unbiased representation of trust on the unit. Unfortunately, we are unable to verify whether survey non-response is correlated with trust. However, we can include these individuals in our models by censoring their out-going ties (which are missing). Finally, we were unable to determine whether the effects of religious affiliation we find are due to an inherent feature of religious belief, organization, or practice, or instead are just a function of propinquity through shared participation in an organization. However, if shared religious identity increased

trust simply by propinquity, we would expect the effect to extend to other religious groups.

## Conclusion

It has been nearly a half-century since the United States undertook a fundamental transformation in the guiding philosophy and organization of prisons. In response to a dramatically increasing prison population and more punitive penal policy, the rehabilitative aim that has persisted for nearly a century was replaced with a management and risk-assessment paradigm where the primary goal is to safely manage large numbers of individuals within prisons (Kreager and Kruttschnitt, 2018; Kruttschnitt et al. 2000). The consequences for incarcerated women are particularly salient at the current time. Although the United States incarcerates substantially fewer women than men, the incarceration rate for women has increased dramatically compared to that of men over the last quarter-century, with the United States now accounting for one-third of the world's incarcerated women (Kruttschnitt, 2011; Travis et al. 2014). These structural and organizational shifts in penology philosophy are much less conducive to prisoner relationships and have been argued to result in greater mistrust characterizing those relationships (Crewe, 2007; Kruttschnitt and Gartner, 2005; Liebling and Arnold, 2012; Owen et al. 2017). Thus, it is not surprising that our findings are consistent with prior research that, on average, incarcerated women in our study only trusted about 3% of the other women on the unit (although there was considerable variation in how trusting or trustworthy women were).

On the other hand, finding that on average, women trusted nearly 4 other residents to support them during arguments or conflicts highlights the fact that almost all of the women in this prison unit were able to overcome the challenges to establishing trust, as the majority had at least one relationship whom they could depend on. This finding is also consistent with Coleman's

(1990) argument about adversity and trust. In addition to network and individual characteristics, Coleman argued that trust is also more likely to form when an individual is in a "desperate situation from which he cannot extricate himself without help" (1990:107). This notion of a desperate situation clearly characterizes the prison environment where individuals face the constant threat of violence from others and desperately need to make alliances with other prisoners with whom they can rely on for support when conflict emerges (also see McCarthy, Hagan and Cohen [1998] for a discussion of adversity, trust, and co-offending). Thus, even in a time that prioritizes control and management of prisoners, our results demonstrate that trust can emerge under certain circumstances that likely make incarceration safer and more bearable (also see Schaefer et al. 2017). For women whose trust has been abused or shattered by the harm caused by loved ones prior to incarceration, being able to trust another person and not have that trust abused is likely particularly beneficial for incarcerated women's well-being.

In addition, our findings overlap with research examining criminal co-offending relationships. Individuals within both prison and co-offending networks face similar trust dilemmas. In both cases, risk and reward must be balanced against the deleterious consequences of incorrectly assessing the trustworthiness of another (Gambetta, 2009). Because the co-offending literature emphasizes the utility of forming trusting relationships with potential co-offenders for increasing the success of and returns to criminal offending (Charette and Papachristos, 2017; Tremblay 1993; McCarthy et al., 1998), future research could benefit by considering whether and how trust networks interact with other types of ties such as reputation, power, or utility. Thus we might find similar entrained networks (as we do here with friendship and trust networks) between trust and other types of networks.

Although not the primary focus of the study, it is worth considering how creating an

environment where prisoners can forge trusted relationships with one another could also improve the prison climate for correctional officers and other staff members. In general, cooperation only emerges with trust, and greater cooperation among prisoners could produce a more stable and less explosive environment where prisoners and correctional officers have increased opportunities to work together to produce a safer setting to work and live. If trust reduces conflict or helps mitigate against more serious violence, then correctional officers could spend less time managing prisoners and devote more time to rehabilitation goals. Whether or not this occurs requires further empirical study.

To conclude, knowing whether and how incarcerated women establish relationships of trust with one another is crucial for understanding how individuals adjust to conditions of confinement. Our findings point to the important role of social position for understanding how women navigate trust relationships. Future work may benefit by treating trust as an independent variable, examining how a "stock" of trust relationships may improve mental health and adjustment to confinement as well as consider how this trust can be harnessed to foster rehabilitative ideals. Furthermore, examining differences in trust across prison units might shed light on how outcomes of interest (such as misconduct) might be influenced by the social organization of trust. Beyond these questions, this study demonstrates that criminology would benefit significantly from embracing a relational conceptualization of trust that provides precise measures that can be replicated across settings. In general, our study also shows that a network approach provides an avenue for more rigorous conceptualization and operationalization of analytical concepts and hypothesized processes in criminology and criminal justice.

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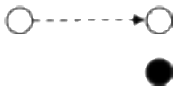
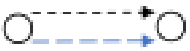
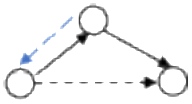
Table 1: Hypotheses and Network Configurations

| Hypothesis | Network Configuration[a,b] |
|---|---|
| 1. *i* is more likely to trust *j* if *j* is older (hypothesis 1a), has served more time in prison (hypothesis 1b), and has spent more time on the unit (hypothesis 1c). |  |
| 2. *i* is more likely to trust *j* if *j* is the same religious affiliation as *i* |  |
| 3. *i* is no more likely to trust *j* if *j* is the same race/ethnicity as *i* |  |
| 4. *i* is more likely to trust *j* if *i* gets along with *j* |  |
| 5. *i* is more likely to trust *j* if *j* trusts *i* |  |
| 6. i is more likely to trust j if a) i trusts k and k trusts j and b) k gets along with i |  |
| 7. *i* is more likely to trust *j* as *i*'s brokerage in the get along with network increases |  |
| 8. *i* is less likely to trust *j* as *j*'s brokerage in the get along with network increases |  |

*Notes* :

[a]Short-dash black lines indicate the hypothesized trust tie, solid black lines represent existing trust ties; long-dash blue lines represent existing get along with ties.

[b]Black/White nodes indicate the presence/absence or higher/lower value of an attribute, respectively.

| Table 2: Descriptive Statistics (n = 131)[a] | | | | | |
|---|---|---|---|---|---|
| Variable | Mean, proportion | SD | Indegree $(t, r)$ | Outdegree $(t, r)$[b] | Homophily (OR, Moran's I) |
| Age | 47.08 | 12.38 | 0.17* | -1.63 | 0.26*** |
| Time in Prison (years) | 11.01 | 10.81 | 0.41*** | 0.01 | 0.53*** |
| Time on Unit (years) | 3.89 | 4.06 | 0.27** | 0.05 | 0.33*** |
| *Religion* | | | | | 1.46*** |
| Christian | 0.82 | ----- | 1.31 | -1.12 | ----- |
| Muslim | 0.07 | ----- | -0.74 | 1.58 | ----- |
| None | 0.06 | ----- | -2.39* | -0.25 | ----- |
| Other | 0.03 | ----- | 3.15* | 4.66*** | ----- |
| *Race* | | | | | 1.81*** |
| White | 0.58 | ----- | 2.19* | -0.17 | ----- |
| Black | 0.33 | ----- | -3.41** | -0.42 | ----- |
| Hispanic | 0.08 | ----- | 3.88** | 4.13*** | ----- |
| Get Along With Brokerage (log) | 2.91 | 1.93 | 0.41*** | 0.31** | 0.08 |
| Trust Indegree | 3.93 | 3.02 | ----- | 0.21* | ----- |
| Trust Outdegree[b] | 4.08 | 6.14 | 0.21* | ----- | ----- |

*Notes* :

[a] $p \leq 0.001$***, $p \leq 0.01$**, $p \leq 0.05$* (two-tailed tests).

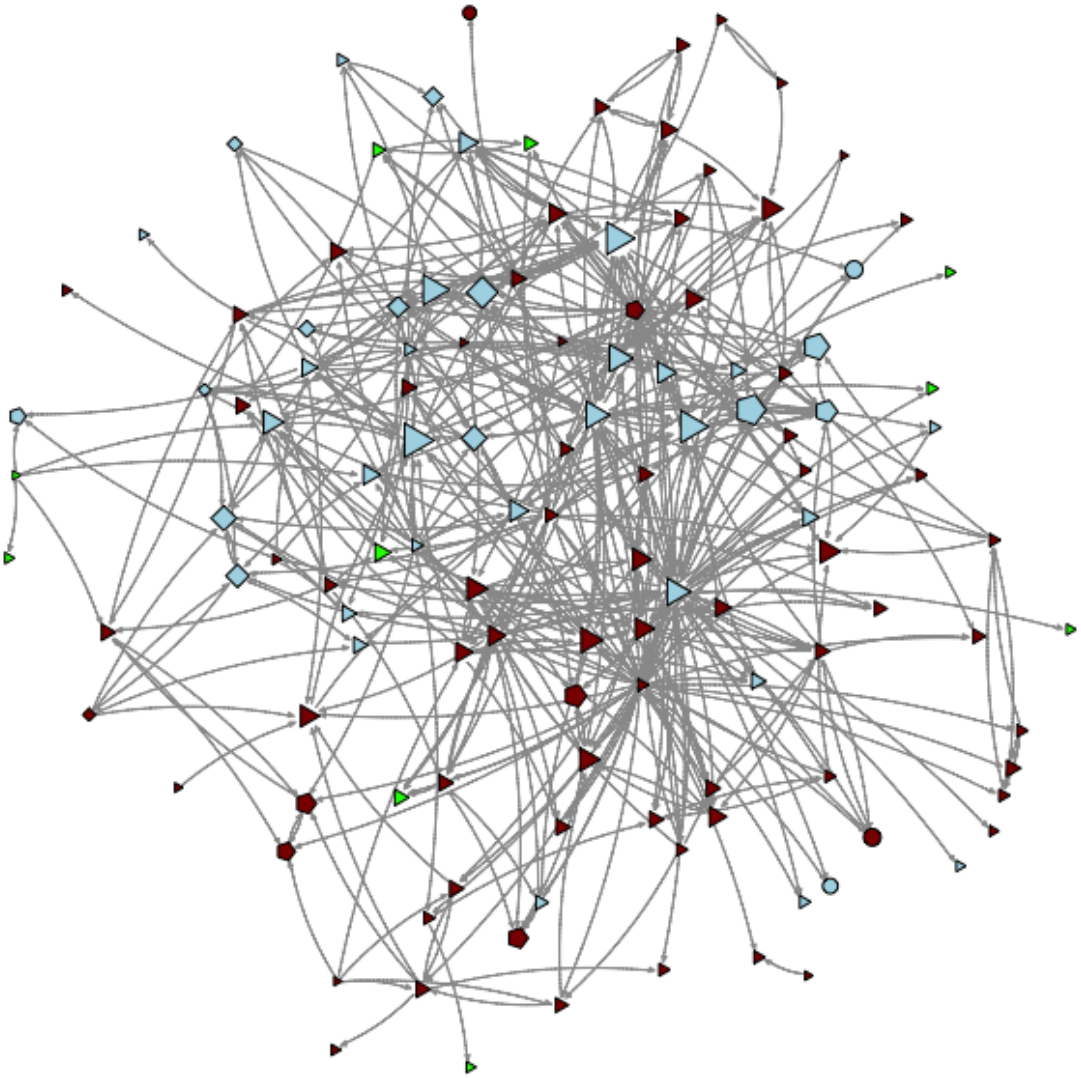
[b] Outdegree restricted to 103 individuals eligible for trust nominations.

Table 3. Exponential Random Graph Model[a] of Trust Network (N = 131)

| Model Term | Estimate | SE | AME[b] |
|---|---|---|---|
| *Structural Controls* | | | |
| Edges | -2.228** | 0.869 | -0.042 |
| GWIDEGREE (decay = 0.25) | 0.134 | 0.350 | 0.249 |
| GWODEGREE (decay = 0.25) | -1.583*** | 0.334 | -2.952 |
| Two-path | -0.055*** | 0.016 | -0.102 |
| Transitive Closure (GWESP OTP [alpha = 0.7]) | 1.019*** | 0.078 | 1.900 |
| Cyclical Closure (GWESP ITP [alpha = 0.7]) | -0.414*** | 0.089 | -0.772 |
| *Age (years)* | | | |
| Indegree/receiver | 0.004 | 0.005 | 0.007 |
| Outdegree/sender | -0.031*** | 0.005 | -0.057 |
| Absolute difference | 0.004 | 0.006 | 0.008 |
| *Time in prison (years)* | | | |
| Indegree/receiver | 0.011 | 0.007 | 0.021 |
| Outdegree/sender | -0.004 | 0.008 | -0.008 |
| Absolute difference | -0.014 | 0.007 | -0.026 |
| *Time on unit (years)* | | | |
| Indegree/receiver | -0.012 | 0.017 | -0.023 |
| Outdegree/sender | 0.047** | 0.018 | 0.087 |
| Absolute difference | -0.039* | 0.017 | -0.073 |
| *Religion*[c] | | | |
| Indegree/receiver (Christian is referent) - Muslim | -1.153* | 0.694 | -2.151 |
| Indegree/receiver (Christian is referent) - None | -0.964 | 0.717 | -1.798 |
| Indegree/receiver (Christian is referent) - Other religion | -0.939 | 0.737 | -1.751 |
| Outdegree/sender (Christian is referent) - Muslim | -1.991** | 0.709 | -3.714 |
| Outdegree/sender (Christian is referent) - None | -1.368* | 0.689 | -2.552 |
| Outdegree/sender (Christian is referent) - Other religion | -1.673 | 0.864 | -3.121 |
| Match - Christian | -0.874 | 0.710 | -1.631 |
| Match - Muslim | 2.315** | 0.790 | 4.318 |
| Match - None | 2.410*** | 0.939 | 4.495 |
| *Race/ethnicity* | | | |
| Indegree/receiver (White/Other is referent) - Black | 0.835 | 0.434 | 1.557 |
| Indegree/receiver (White/Other is referent) - Hispanic | 0.171 | 0.369 | 0.319 |
| Outdegree/sender (White/Other is referent) - Black | 0.528 | 0.421 | 0.984 |
| Outdegree/sender (White/Other is referent) - Hispanic | -0.320 | 0.358 | -0.597 |
| Match - White | 0.637 | 0.444 | 1.188 |
| Match - Black | -0.343 | 0.443 | -0.640 |
| Match - Hispanic | 0.885 | 0.920 | 1.650 |
| *Entrainment* | | | |
| Get along with network edge covariate | 2.995*** | 0.138 | 5.585 |
| *Embeddedness* | | | |
| Dyadic embeddedness (reciprocity) | 1.255*** | 0.293 | 2.341 |
| Network embeddedness | 0.877*** | 0.117 | 1.635 |
| *Brokerage* | | | |
| Indegree/receiver | -0.021 | 0.033 | -0.039 |
| Outdegree/sender | -0.202*** | 0.040 | -0.377 |
| *Model Fit* | | | |
| AIC | 2544 | | |
| BIC | 2816 | | |

[a]Estimates are for models drawn from a distribution of outdegree restricted nominations.
[b]Average marginal effect is multipled by 100 to reflect percentage change in the probability of a tie.
[c]Other religion and No religion excluded from matching estimate due to too few cases in group.
$p \leq 0.001$***, $p \leq 0.01$**, $p \leq 0.05$* (two-tailed tests).

Figure 1. Trust Network for 131 Women



*Notes*:
Nodes colored by Race/Ethnicity (White= Red; African American = Blue; Hispanic = Green).
Nodes shaped by Religious Affiliation (Triangle = Christian; Muslim = Square; None = Pentagon; Circle = Other).
Nodes sized proportional to indegree centrality (i.e. larger nodes received more trust nominations).
6 isolates excluded from plot.

Figure 2. Predicted Probabilities for Selected Estimates (Estimates shown for Mean, +1sd, -1sd)