Social Integration, Victimization, and Stress among Female Inmates

Thesis

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Abstract

The importance of social integration for well-being harkens back to Durkheim (1951) and his observation that social relationships are generally protective of individuals' psychological well-being by fostering integration and feelings of social connectedness. Since then, the association between social integration and well-being has been well-documented, including recent research examining the role of social integration for incarcerated men's mental and physical health behaviors (Haynie et al., 2018). The current study extends this research by focusing on the association between prison social integration and female inmate's self-reported stress. Although many aspects of imprisonment and the deprivations they produce increase stress, I pay particular attention to the role of in-prison violent victimization as an especially salient source of stress among incarcerated women. Thus, I ask the following research questions: 1) Do female inmates who experience violent victimization within prison report higher levels of perceived stress than women not experiencing this type of victimization? 2) Does social integration with other inmates on the unit reduce female inmates' perceptions of stress? And 3) is social integration particularly important for buffering perceptions of stress among women experiencing violent-victimization? Using data from a sample of 104 female inmates in a "good behavior" unit located in a medium-security Pennsylvanian prison, I use social network and survey data with ordinal logistic regression to address

my research questions. Consistent with prior literature, findings indicate that female inmates, overall, report high perceptions of stress while incarcerated. Further, women experiencing violent victimization while incarcerated report significantly higher levels of stress compared to non-victimized women. Also, results indicate that social integration, measured as the number of unit inmates a respondent gets along with, is especially crucial for victimized inmates and operates to reduce their perceptions of stress substantially. In contrast, among the non-victimized women, my measure of social integration is unrelated or, in some cases, positively associated with women's reports of stress. I discuss the implications of these findings in the context of improving the conditions of incarceration.

Dedication

Dedicated to the Students at The Ohio State University

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I'd like to thank my advisor Dana Hanie, my committee members Ryan King and Cynthia Colen, Michael Vuolo, and my colleague Nicolo Pinchack for their assistance in completing this thesis.

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Publications

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Chapter 1. Introduction

When it comes to psychological wellbeing, prisoners are a particularly vulnerable group, with mental health outcomes fairing considerably worse than the general population even before incarceration (Travis, Western, & Redburn, 2014). Once incarcerated, prisoner mental health typically continues to erode (Gitonia & Miloni, 2016; Wildeman & Muller, 2012), with poor mental health often persisting after release from prison (Massoglia & Pridemore, 2015; Massoglia, 2008; Schnittker, Massoglia, & Uggen, 2012). A critical factor shaping inmates' mental health is the extreme stress they experience while incarcerated resulting from prison deprivations, including the loss of autonomy, security, liberty, and the severance of ties to outside friends and family (Kreager & Kruttschnitt, 2018; Sykes, 1958).

Problems related to mental health and psychological wellbeing among the incarcerated are not shared equally, with incarcerated women experiencing significantly worse mental health before, during, and after incarceration compared to male inmates (Binswanger et al., 2010; Gartner & Kruttschnitt 2004; Lindquist & Lindquist, 1997; Owen, 1998; Owen, Wells & Pollock, 2017). Similar to gender differences in the prevalence of mental health challenges, perceptions of stress associated with incarceration are typically greater for incarcerated women than incarcerated men (Fedlock, 2017; Lindquist and Linquist, 1997; Owen, 1998). In part, this results from

female prisoners' experiencing greater drug dependency, trauma, abuse, and mental health issues, as well as women's extreme concern about their children's well-being during their incarceration (Bloom, Owen, & Covington, 2005; Owen, 1998; Owen et al., 2017). Once incarcerated, women also experience less sleep, more depression, and higher rates of self-harm behavior than men, which exacerbates an already unhealthy and extremely stressful prison environment (Bloom et al., 2005; Messina & Grella, 2006, Plugge, Douglas, & Fitzpatrick, 2008; Sered & Norton-Hawk, 2013; Wooldredge & Stiener, 2016).

In addition to the factors discussed above, a particularly salient source of stress in prison is the fear of being victimized by others while incarcerated. Experiencing violent victimization in prison likely amplifies stress by further reducing inmates' fragile sense of control and security (McEwen, 2005), increasing both acute (immediate) and chronic (long-lasting) stress (Porter 2019; Hochstetler, Murphy, & Simons, 2004). Although men's prisons are generally much more violent than women's (Kruttschnitt & Gartner, 2003; Kreager & Kruttschnitt, 2018; Lahm, 2015; Owen, 1998; Trammell, 2009), female inmates remain at considerable risk of being victimized by others. For instance, between 20-30% of female prisoners are estimated to experience violent victimization during incarceration, which is more than ten-fold their victimization rate experienced outside of prison (Blitz, Wolff, & Shi, 2008; Wolff et al., 2007; Wulf-Ludden, 2013).Despite the veritable stress experienced from victimization in prison, relatively little is known about women's experiences of violent victimization during incarceration, nor about factors that

may amplify or reduce the harmful effects of victimization on women's perceptions of stress.

While victimization is likely to amplify incarcerated women's stress, social integration, and social support are identified in the general literature as important factors that can reduce feelings of stress and improve mental and physical health. Although little research has focused on the importance of social integration within prisons for improving well-being, a recent study by Haynie and colleagues (2018) offers a notable exception. Their study employed network and survey data and documented a positive association between incarcerated men's social connections to other inmates and the men's self-ported health behavior, including reporting lower levels of depressive symptoms (Haynie et al., 2018).

The current study builds upon prior research by focusing on the experiences of female inmates and investigating the relationship between prison victimization and stress. In addition, I pay particular attention to whether social integration (measured as the number of social connections to other inmates) moderates heightened stress associated with in-prison victimization. This significant risk of violent victimization while incarcerated raises an interesting question regarding victimized inmates' integration within prisons. On the one hand, victimized women may fear and distrust other inmates as a result of their victimization experiences and avoid forming relationships with other inmates. On the other hand, victimized women may seek out and cultivate inmate connections for the resources they may provide, including protection against future

victimization.[1] Whether or not victimized inmates have smaller or larger social networks in prison remains an open question. Similarly, the question of whether or not social connections moderates heightened stress associated with victimization remains to be answered.

Using novel network and survey data recently collected in a Pennsylvanian woman's prison, I conduct ordinal logistic regression to address the following research questions: 1) Do female inmates who experience violent victimization within prison report higher levels of perceived stress than women not experiencing this type of victimization? 2) Does social integration with other inmates on the unit reduce female inmates' perceptions of stress? And 3) is social integration particularly important for buffering perceptions of stress among women experiencing violent-victimization?

[1] Of relevance for the current study, research focusing on victimization experiences in schools identified peer support as a factor that was effective in buffering the negative effect of victimization on students' quality of life (Flaspoler et al., 2009). This finding raises the question of whether peer support operates similarly within prison, acting as a potential protective factor for reducing the negative impact of victimization on stress.

Chapter 2. Background

Women's Stress in the Prison Context

Within the prison literature, it is widely documented that inmates suffer many deprivations associated with incarceration (Blevins et al., 2010; Douglas, Plugge, & Fitzpatrick, 2009; Sykes, (1958); Zamble & Porporino, 1990). Some evidence suggests these hardships are considerably more present in women's prisons compared to men's. For instance, female prisoners often experience multiple intersections of disadvantage and traumatic life events before incarceration, resulting in female inmates entering prison with acute and often chronic mental health problems (Owen et al., 2017; Wolff et al., 2010; Messina & Grella, 2006). Notably, female prisoners are more likely to have histories filled with trauma and abuse than women not incarcerated, and they are four times as likely to have been victimized in the past compared to the experiences of male prisoners (Bloom et al., 2005). In addition to past trauma and disadvantage, scholars routinely cite drug use (Bloom et al., 2005; Plugge et al., 2008), mental health issues (Alves & Maia, 2017; Feldlock, 2017), self-harm (Howard et al., 2017), nutrition (Brisman, 2008), strict rules (Douglas et al., 2009; Fellner, 2006; Goomany & Dickinson, 2015;), interpersonal dynamics (Greer, 2016; Trammel, 2009), and separation from children (Christian, 2005; Dodge & Pogrebin, 2001; Houck & Looper 2002;) as loci of distress for incarcerated women. Therefore, it is not surprising that the context of female

prisons is viewed as more stressful than the male prison environment (Bloom et al., 2005; Lindquist & Lindquist, 1997; Owen et al., 2017).

Despite the apparent mental health crisis experienced by women in prison, it is often difficult for women to access health services while incarcerated (Ahmed et al., 2016; Harner & Riley, 2013). When resources are available to inmates, they are often insufficient and below medical standards (Harner & Riley, 2013; Kosak, 2005). Compounding this, female prisoners regularly experience discontinuous mental health care as they transition in and out of prison (Ahmed et al., 2016; Sered & Norton-Hawk, 2013). High levels of past trauma, combined with the environmental stress of prisons and the inability to seek treatment, contribute to exceptionally high rates of mental health issues for incarcerated women. In 2004, between 61-73% of incarcerated women in federal and state prisons respectively were identified as having a mental disorder (in comparison to 12% of women in the general population) (James & Glaze, 2006). More recent research suggests this disparity is even higher than previous estimates, with upwards of 93% of female prisoners having mental health disorders (Wolff et al., 2010). Considering the highly stressful environment of women's prisons and women's limited access to treatment, research is needed to ascertain methods to reduce the daily, and cumulative stress women encounter while incarcerated.

Victimization in Prison

Fleury-Steiner and Wooldredge (2020) note that the majority of prison victimization research focuses on male inmates, with much less attention directed toward

the experiences of female inmates. This lack of awareness is unfortunate, as female inmates also engage in violent offenses against one another while incarcerated (Blackburn & Trulson, 2010). Surveying five adult prisons in a Midwestern state, Wulf-Ludden (2013) finds that the chance of physical victimization in prison for men and women was 50% and 30%, respectively. Other studies suggest the magnitude of victimization experienced by incarcerated women is even more significant than the 30% noted by Wulf-Ludden (2013), with some studies suggesting that the prevalence of in-prison violent victimization is quite similar for male and female inmates (Wooldredge & Steiner, 2016; Wolff & Shi, 2011). Altogether, these studies reveal that imprisoned women experience considerable rates of prison victimization, and research is needed to understand the consequences of exposure to violent victimization during incarceration.

In addition to high instances of physical victimization, research suggests female prisoners are more prone to engaging in verbal and psychological aggression than men. Trammel (2009) identifies the most prevalent form of victimization among women in prison to be "relational violence," such as spreading negative rumors, acting petty, and engaging in verbal violence. Other research indicates that incarcerated women are victimized by property theft more frequently than men (Wooldredge & Steiner, 2016). When considering the already high amounts of physical victimization female prisoners experienced before incarceration, the considerable prevalence of interpersonal aggression in female prisons suggests incarcerated women undergo far more victimization than previously estimated.

Within the male prison context, victimization is positively correlated with higher instances of stress, anxiety, and depression (Porter, 2019; Wooldredge, 1999), and often results in post-traumatic stress disorders (Hochstetler et al., 2004). Evidence also suggests that deleterious psychological effects of victimization persist even after release from prison (Listwan et al., 2010; Schnittker et al., 2012). Thus it is not surprising that both male and female inmates report fear of prison victimization as a significant concern (Porter, 2019), with victimized inmates reporting substantially reduced feelings of safety and security (Wolff & Shi, 2009). Within prisons, victimization and the threat of victimization are salient sources of stress for incarcerated individuals.

Despite the prevalence of victimization among female prison populations, most research examining the impact of prison victimization on mental health has focused exclusively on male prisoners. Furthermore, articles investigating the intersection of mental health and victimization experiences often use data that were collected after respondents were released from prison, which may not accurately capture in-prison experiences (Hochstetler et al., 2004; Listwan et al., 2010; Porter, 2019; Schnittker et al., 2012). Last, although literature suggests victimization is a common stressor in prison, most studies investigating the psychological impacts of in-prison victimization focus on mental health outcomes more broadly, seldom measuring stress as the outcome variable. This is a significant omission, as stress often operates as a precursor to or amplifier of many other mental health outcomes observed in prior studies (Haynie et al., 2018; McEwan, 2012; Seeman, 1997; Seplaki, et al., 2006). The current study is designed to fill the gaps in research identified above, by assessing the association between in-prison

violent victimization and perceptions of stress among a sample of currently incarcerated women. Based on the literature reviewed above, I hypothesize the following: H_1: *Women in prison who have experienced violent victimization during incarceration will report higher levels of stress than non-victimized incarcerated women.*

Social Integration and Stress

The importance of social integration for well-being harkens back to Durkheim (1951) and his observation that social relationships are generally protective of individuals' psychological well-being because they foster integration, feelings of social connectedness, and enable connected individuals to focus on the broader needs of the group, rather than individuals' egotistical desires. Within the general stress literature, social integration is emphasized because it provides access to social support and other beneficial resources that both reduce experiences of stress (Listwan et al., 2010; Seeman et al., 2002) and can reduce the amount of strain experienced after undergoing stressful events (Berkman et al., 2000; Lindorff, 2000; Pearlin et al., 1981).[2] For instance, research finds that social support can minimize subsequent depression after a stressful event (Wang et al., 2014), as well as increase resiliency to stress (Wilks, 2008). In contrast, social isolation can amplify the detrimental effects of other stressors (Kamarck, Manuck, & Jennings, 1990; Steptoe, 2000; Yang et al., 2013). In short, the absence of social ties

[2] Berkman et al. (2000) define social support as the availability of "emotional, instrumental, appraisal, and informational" aid from others.

can contribute to stress. In contrast, a more extensive social network can reduce stress and may even serve as a buffer against other stress-producing experiences.

Durkheim's work (1951) also suggests that the need for and importance of social ties to others should be even more significant in the prison context. This greater need for integration is because incarceration is purposely designed to sever individuals' connections and social ties to the outside world and situates inmates in a depersonalized, unfamiliar, hostile, and dangerous environment characterized by extreme levels of anomie.[3] Inmates who can forge connections with others' experiencing similar conditions should experience lower levels of anomie and increased well-being. There is some reason to believe that social relationships and support in prison are more critical for female compared to male inmates because women are more adversely impacted by the severance of their ties to outside family, especially children (Jiang & Winfree, 2006).[4] Consistent with this idea, prison research has found social support to be positively associated with incarcerated women's wellbeing, but not men's (Asberg & Renk, 2014; Hart, 1995).

Extant literature on the nature of female inmate relationships also supports the importance placed on social connections with others. Separated from their families, the social organization of female inmates places more emphasis on building and maintaining social ties with other inmates either through the formation of romantic relationships,

[3] In general, anomie is a context characterized by the absence of clear rules of behavior where individuals' experience uncertainty, conflicting expectations, and ambiguous norms and values (Durkheim, 1951; Thorlindsson & Bernburg, 2004)

[4] One reason social support may be especially important for incarcerated women is because female prisoners often have less experience and more difficulty developing and utilizing healthy coping strategies, compared to the general population (Blevins et al., 2010; Douglas, Plugge, & Fitzpatrick, 2009; Zamble & Porporino, 1990).

pseudo-family ties, or friendships and companionships (Christian, 2005; Collica, 2010; Huggins, Capeheart & Newman, 2006; Pollock, 2002; Severance, 2005; Wulf-Ludden, 2013). More extensive support networks within prisons are likely to offer women more social outlets to 1) process events and daily life, 2) combat the separation and isolation from outside family, especially children, and 3) provide support, advice, information and other resources that can help make the incarceration experience less stressful (Berkman et al. 2000; Cohen 2004). This body of research thus suggests that inmates with more significant social connections to other inmates are more likely to have access to emotional support and other resources to draw upon, which in turn should reduce perceptions of stress experienced while incarcerated. Considering this prior work, I hypothesize that: H_2: *Incarcerated women perceiving greater social connections to other inmates will report lower stress compared to women with fewer social relationships.*

Prison Victimization, Social Integration, and Stress

Experiencing violent victimization while incarcerated makes adaption to prison especially difficult for women (Steiner & Wooldredge, 2009). Given the prison environment already functions as a harbinger of chronic stressors and anomie, the additional acute and post-traumatic stress experiences caused by victimization are likely to compound the effects of the day-to-day chronic stressors encountered in the prison environment (McEwen, 2005). Thus, it is not surprising that victimized women are more likely to perceive the prison environment as hostile, dangerous, and unpredictable, all of which likely increase perceptions of stress while incarcerated (Owen et al., 2017).

Moreover, women who experience in-prison victimization are also much more likely to have experienced victimization before incarceration, and thus enter prison with a history of trauma and abuse (Wolff et al., 2010). As a result, these inmates often have significant trust issues that make it especially difficult for them to forge trusted relationships with other inmates (Greer, 2016).

Whether or not experiencing victimization in prison shapes incarcerated women's willingness or ability to establish social connections with other inmates remains an open question. On the one hand, victimized inmates may be especially unwilling to trust others and view social connections with other inmates as inherently risky, thus avoiding all or most social connections with others.[5] On the other hand, social connections to other inmates may be especially advantageous for victimized women. Social ties to other inmates could potentially provide access to social support and information/resources that may be especially needed and beneficial to victimized inmates (Wright et al., 2012). Given the relatively dangerous prison environment, a larger social network may ease the stress of further threats of victimization by providing additional protection and allies (Ricciardelli, 2014).

Research focusing on the general population suggests the importance of social connections for well-being, as well as some evidence that social connections can buffer the detrimental impact of victimization. Of particular relevance for this study, research by Flaspoler and colleagues (2009) found that peer support buffered the impact of school

[5] Another possibly is that other prisoners may be unwilling to risk forming social connections with victimized inmates, fearing that such relationships could place a target on themselves. Again, this is an open question that requires empirical investigation.

victimization on students' quality of life. This finding is also consistent with a larger body of research in the health literature that emphasizes the importance of social support for attenuating levels of perceived stress, following stressful life events, and for increasing resiliency to stress (Cohen, 2004; Lindorff, 2010; Seeman et al., 2002; Thoits, 1995; Wang et al., 2014; Wilks, 2008).

While not designed to explicitly evaluate the impact of social connections for incarcerated women's perception of stress and well-being, several prison studies suggest the importance of social support for victimized inmates. For instance, a study by Chen and colleagues (2014) found that maintaining supportive relationships with family while incarcerated was particularly helpful for victimized inmates, allowing them to better cope with prison deprivations. Other research suggests that incarcerated women's pseudo-family relationships, where inmates form family-like relationships with one another, offer support and protection against victimization from others (Trammel, 2009).[6] This offer of protection may be an especially important benefit of prison relationships, as the threat of future prison victimization remains a constant stressor, particularly among women who have already experienced in-prison victimization (Owen et al., 2017; Porter, 2019; Wolff & Shi, 2011). Thus the provision of protection offered by establishing relationships with other inmates should not be discounted. In addition to offering protection, having more supportive social connections with other inmates may also help inmates avoid conflict with others, which is often the precursor to violent attacks (Wulf-Ludden, 2013). This

[6] Other research finds that incarcerated women in pseudo-families report better mental health outcomes than women who are not (Wulf-Ludden, 2016). Durkheim's work suggests that the creation of pseudo-family relationships in prison provide roles that have predefined rules and bring order and clear expectations for behavior in an environment characterized by anomie.

finding, in part, may explain why some studies report that more isolated inmates and those lacking social connections to others face heightened risks of victimization compared to their more connected peers (Wooldredge, 1999).

Although focused on recently released male inmates, research by Listwan and colleagues (2010) is notable because it established 1) the lasting detrimental impact of experiencing victimization and coercion during incarceration on men's psychological well-being measured after the men were released from prison, and 2) the importance of social support for increasing men's psychological well-being (as measured by an extensive, multi-item scale that predicts PTSD) following incarceration. However, while social support following incarceration was associated with men's well-being post-incarceration, outside prison social-support did not moderate the detrimental effects of experiencing earlier prison victimization or coercion. Though the findings of Listwan et al. (2010) challenge my argument that social support will moderate the effect of experiencing in-prison victimization on incarcerated women's perceptions of stress, it is important to keep in mind that Listwan and colleagues (2010) study was focused on recently released male inmates and measured psychological well-being and social support following incarceration. My focus on the experiences of incarcerated female inmates, including the social connections they establish with other inmates while incarcerated, are likely much more salient and meaningful for shaping perceptions of stress while incarcerated.

In sum, although prior research, including some qualitative studies of female inmates, suggests that social connections to other inmates may reduce perceptions of

stress and offer particular benefits to inmates experiencing in-prison victimization, almost no research has quantitatively assessed whether or not this is the case. Given prior studies identification of social support as positively impacting well-being and potentially buffering stressful experiences, I expect those female inmates who perceive greater connections to others will be less vulnerable to the stress-inducing aspect of prison victimization. Thus I hypothesize that: *H_3: Perceiving greater social connections to other inmates will be especially beneficial for women experiencing in-prison victimization and will more substantially reduce their perceptions of stress compared to non-victimized inmates.*

Chapter 3. Data and Methods

Sample

To evaluate my hypotheses, I use recently collected data from the Woman's Prison Inmate Networks Study (See Kreager et al., 2017). These data were designed to explore the informal social networks within a woman's prison in Pennsylvania. Data were collected on a "good behavior" unit in 2017 from a minimum-security prison housing female inmates. Women were eligible to be on this unit if no prison rule infractions appeared on their record for at least 12 months before they transitioned to the unit, regardless of the severity of offense or length of their sentence. At the time of the data collection, there were 131 women housed in this unit incarcerated for a variety of crimes and varying sentence lengths, including inmates with the most serious offenses and those sentenced to life in prison. Of these 131 women in the unit, 104 completed an interview, resulting in a 79% response rate.

The primary method of data collection involved the use of surveys administered via in-person interviews within the prison, consisting of both closed and open-ended questions. In addition, the respondents were asked social network questions, which required them to identify from a roster the individuals residing on their unit that they "got

along with."[7] Supporting background information on the respondents came from prison admission records, including respondent age, offense type committed, time spent in a Pennsylvania state prison, and highest education level attained.

These data are uniquely suited for the study, given my focus on within prison social integration measured as the number of social connections that respondents report having with other inmates. They include network-based measures of social integration, women's reports of experiences of violent victimization, and inmates' perceptions of their stress within the prison. The dataset used is not without limitations, as it focuses on incarcerated women in a "good behavior" unit in one prison in Pennsylvania, reducing my ability to generalize my results beyond these sample restrictions. Nevertheless, the study was designed to improve on past measurements of my key concepts, including social integration, victimization experiences, and perceptions of stress and is the first study to quantitatively assess these relationships among a sample of incarcerated women. Of the 104 women represented in the data, nearly all of them consistently responded to the entirety of survey and roster questions. Therefore, the only variable with a missing case was education. The missing value was imputed based on the median years of education reported for the rest of the sample.

[7] Prisoners were asked about those inmates on the unit they got along with rather than directly asking them to identify their friends. This was done purposely as prior research suggests that many inmates view the term "friendship" very critically and when directly asked about their friendships would immediately say that inmates do not have friendships but rather acquaintances they get along with (Severance, 2005; Greer, 2016). Upon further prodding, they would describe their acquaintances with very similar terms used to describe friendships.

Measures

Perceptions of Stress. In the survey, stress was defined as feeling tense, restless, nervous, anxious, or unable to sleep at night due to troubled thoughts. Based on this definition, women were asked whether they currently experienced stress "never (1)," "rarely (2)," "sometimes (3)," or "most of the time (4)." These responses were compiled to create a scale (ranging from 1-4) indicating the level of stress experienced by a respondent, with greater levels of stress scoring higher on the scale. I chose to retain the ordinal nature of this measure and apply ordinal regression for my multivariable analyses.

Victimization in prison. Respondents were asked multiple questions related to their experiences of victimization occurring during their current sentence. I focus on two indicators: experiences of violent victimization and sexual victimization while incarcerated. To measure violent victimization, respondents were asked if, during their prison stay, anyone punched, grabbed, slapped, or choked them. Sexual victimization was measured by asking if any sexual act was coerced or forced on them during their current prison stay. Due to the small sample size and only two inmates having experienced sexual victimization, the two types of in-prison victimization were combined into one binary measure of prison victimization, with 1 indicating the inmate had experienced at least one incident of in-prison victimization (0 = no victimization exposure)[8].

[8] I originally included a dummy variable to control for sexual victimization independently of physical victimization to assure combining sexual victimization with violent victimization did not alter our results. The coefficient for sexual victimization as expected due to sample size was not significant. Therefore, I combined violent and sexual victimization and recorded inmates as experiencing violent victimization if they had experienced either form.

Social integration. Research investigating the relationship between social ties and stress typically measures social integration via perceived or received social ties to others (Tardy, 1985). The most commonly used of the two is perceived social ties, which measures individuals' perception of the number of connections they have to others (in network terms, these are referred to as the sent network ties). Alternatively, social integration could be measured based on the number of other inmates who nominate the respondent as a friend (referred to as received social ties). While I have measures of both the sent and received social ties in the data, given my focus on perceptions of stress, I believe that inmates' perceptions of social connections should be most relevant for reducing the stress experienced in prison. Therefore, perceptions of social connections are the focus of my research, although I include a control for received social connections as well, in multivariate analyses. To capture perceived social connections, participants in the study were asked to identify other inmates on their unit whom they got along with, from a roster that included the names (and nicknames) of all inmates on their unit (with no restriction on the number of other inmates they could identify). These ties were compiled into a binary network matrix, with a one indicating that a tie has been sent to another inmate on the unit, and a zero indicating no relationship between pairs of inmates. The measure, *number of social connections (sent ties),* was created by summing the number of inmates on the unit that respondents' indicated they got along with. This summed indicator of the number of ties had a strong positive skew; thus, I used a square root transformation.

Control variables. The analysis included several control variables that prior research has linked to experiences of victimization and or perceptions of stress. It is well known that most incarcerated women have histories characterized by abuse, trauma, and experiences of victimization (Wolff et al., 2010). Prior literature also notes that experiences of victimization before age 18 and victimization as an adult prior to incarceration are associated with incarcerated women's mental and physical health during incarceration (Messina & Grella, 2006; Wolff et al., 2010). Consequently, to better isolate the effect of experiences of in-prison victimization, I include controls for previous victimization. I incorporate two controls that I term *childhood victimization* and *pre-incarceration victimization,* respectively. Childhood victimization was captured by coding respondents as 1 if they responded having experienced sexual victimization, physical victimization, or both, before the age of 18 (respondents with no forms of childhood victimization=0). The variable pre-incarceration victimization was measured by asking respondents if they had experienced any form of violent or sexual victimization within 12 months before their incarceration (1 = yes, 0 = no).

I also include several demographic and background characteristics as controls. *Age* refers to the respondent's age at the time of the survey. The majority of the sample is white; therefore, *non-white* denotes racial minority status. Non-white consists of primarily black women, but also includes some Hispanic and Asian identifying women. *Years in prison* captures the length of time inmate respondents were held in a

Pennsylvania state prison during their current sentence. *Education* reflects respondents' years of education[9].

Analytic Strategy

I begin my analyses with descriptive statistics that reveal the average stress level, the number of reported social ties to other inmates, and the proportion of women who were victimized in prison. Following the discussion of the sample attributes, next I examine descriptive statistics separately by women's within-in prison victimization status. Doing so provides some preliminary evidence of potential differences between women who were victimized in prison compared to those who did not experience within-prison victimization.

To evaluate my hypotheses, I present three nested ordinal logistic regression models. The first two models examine the association between in-prison victimization and perceived social ties with respondents' perceptions of stress. Given the importance of prior victimization in victimization literature, model 2 adds controls for prior childhood and adult victimization history to ensure that the association between in-prison victimization and stress remains robust. Model 3 evaluates the interaction hypothesis that expects social ties to be especially crucial for buffering the impact of within-prison

[9] In supplementary analyses, I evaluated whether the results were robust to alternative controls including whether the respondent was serving a life sentence, had children, her relationship status, drug offence status, and religiosity. Inclusion of these additional controls did not significantly improve model fit or change the findings presented here. Thus, I omitted these additional controls from final models.

victimization on women's perceptions of stress. To do so, in model 3 I add an interaction between in-prison victimization and the number of social ties.

Chapter 4. Results

Sample Descriptives

Table 1 presents the descriptive statistics of the sample. Overall, incarcerated women in my sample scored an average of 2.63 on the stress scale that ranged from 1-4, indicating the average respondent reports experiencing stress in prison "rarely" or "sometimes." Furthermore, about 28% of the women report being violently victimized while incarcerated, similar to previous estimates of female victimization in prisons.[10]

The women in my sample are also well integrated in terms of social connections to other inmates on the unit. For example, on average, women identified almost 12 other inmates on their unit as someone they get along with (sent ties). However, this also masks considerable variation with some women reporting no connections to others (2%) and others reporting getting along with almost 2/3 of the unit residents (st. dev. = 13.17). On average, respondents received two fewer "get along with" nominations than they sent, with inmates on average being nominated as a friend by almost ten other inmates on the unit (st. dev. = 5.2) with a range of 1-25 received nominations. Thus, while some inmates report having no connections with others on the unit, every inmate was nominated as a

[10] It is worth noting all cases of recorded victimizations were perpetrated by a fellow inmate; no respondents reported abuse from a corrections officer.

social connection by at least one other inmate on the unit, with women perceiving more friendships than they receive.

The average age of inmates in the unit is 47, with inmates having spent an average of ten years in prison. The sample includes 60% of inmates classified as white, with 40% classified as non-white. On average, women completed 12 years of school, suggesting most of the women in my sample completed high school (or earned a diploma while incarcerated). Consistent with prior research, more than half of the women in the sample had experienced at least one instance of violent or sexual victimization before the age of 18 (55% of the sample), with 56% reporting experiencing adult victimization in the year preceding imprisonment.

Table 2 presents descriptive statistics by victimization status and reveals substantial differences in inmates' perceptions of stress. The average stress level for women victimized during their current prison stay is 3.25, which is significantly higher than the stress level of 2.41 for non-victims ($p<.001$). In terms of the individual categories of stress, victimized women never reported "never experiencing stress" (0%) compared to 17% of non-victimized women, saying that they "never experienced stress." About 18% of victimized women report "rarely experiencing stress" compared to 32% of the non-victimized women (although this difference is not statistically significant). Consistent with my expectations, 43% of victimized women report "almost always experiencing stress" compared to only 7% of the non-victimized women reporting the highest level of stress. These descriptive results provide strong evidence that victimized

women experience substantially higher amounts of stress while incarcerated compared to their non-victimized peers

Turning to social connections to other inmates on the unit and the question of whether victimized women would be more or less likely to establish ties to other inmates, results in Table 2 support the former expectation. Victimized women, on average, perceive having more social connections to other inmates on their unit (nominating, on average, 15.75 other inmates) compared to their non-victimized peers. The latter nominate an average of 10.24 other inmates in their get along with network, a significant difference. Although my analyses are not designed to establish causal associations, these differences in perceptions of social ties suggest that victims may intentionally or subconsciously seek out more social connections. In contrast, when we focus on the number of other inmates on the unit that nominate the respondent as a friend (# of social connections (received ties)), I find on average no difference in the number of times that victimized or non-victimized inmates are identified by others as a friend (victimized women received on average 10.32 nominations compared to 9.87 received by non-victimized women (n.s.).

Table 2 also reveals that experiences of victimization before incarceration are significantly higher for respondents who report being victimized while incarcerated. That is, victims of violence during incarceration were far more likely to have been victimized as an adult before prison (79%) compared to 47% of those not victimized in prison ($p<.01$). Similarly, victimized inmates report significantly higher experiences of childhood victimization, with 71% of inmates victimized in prison experiencing

childhood victimization compared to 47% of non-victims ($p<.05$). I see no significant difference by victimized status for my other control variables.

Multivariable Results

To evaluate my three hypotheses, I next turn to multivariable ordinal regression analyses presented in Table 3. Consistent with expectations, model one indicates that women who were victimized while incarcerated are 6.55 times more likely to be in a higher stress category than women not experiencing prison victimization ($p<.001$). Contrary to my expectations, this analysis presents insufficient evidence to claim that incarcerated women's

perceptions of social connections to other inmates (sent-ties) are associated with stress outcomes, although receiving more friendship nominations by other inmates (via received ties) is significantly associated with reports of lower stress, with a one-unit increase in the number of received social ties reducing the odds of being in a higher stress level by 11.7% ($p<.01$). These findings suggest that, on average, being perceived by other inmates as a friend is more important for shaping perceptions of stress, than inmates' perceptions of the number of social connections they have to others. Thus I find mixed evidence for hypothesis two that anticipated that inmates with greater social connections to other inmates would experience lower stress compared to those inmates lacking or with fewer social connections. Although perceptions of social ties were not associated with reports of stress as anticipated, an alternate measure of social integration based on the number of

times other inmates identified the respondent as a friend was significantly associated with lower reports of stress.

In terms of control variables, model 1 indicates that age is associated with lower levels of perceived stress, with every additional year in age reducing the odds of being in a higher stress category by 4.5% (P<.01). However, net of age, the number of years incarcerated increases perceptions of stress such that each additional year of being in prison is associated with greater odds of being in a higher stress category (increases by 1.064 times per year (p<05). Net of other variables, race, and education appear unrelated to women's perceptions of stress.

Model 2 incorporates the measures of pre-prison victimization experiences by adding indicators of whether respondents experienced *childhood victimization* or *prior adult victimization.* I do so to ensure that prison victimization is not acting as a proxy for earlier experiences of victimization. As model 2 shows, controlling for victimization experienced before incarceration does not account for the positive association observed for in-prison victimization and perceptions of stress. In fact, including these controls does very little in terms of altering the size or significance of other coefficients in the model. For example, the odds ratio associated with in-prison victimization decreases very minimally once I account for experiences of prior victimization, suggesting previous victimization does not account for the stress-inducing effect of experiencing in-prison victimization.

To evaluate the final hypothesis that anticipates increased social connection to other inmates is especially beneficial for women who have been the victims of violence

while incarcerated, my final model (3) adds an interaction term between in-prison victimization and the number of perceived social ties. With the addition of the interaction effect, multiple relationships are revealed. Regarding in-prison victimization, holding the number of sent-ties at their mean, the odds of being in a higher category of stress are 12.44 times greater for women who were victimized in prison compared to the effect of sent-ties for non-victims ($p<.001$)[11]. To calculate the association between the number of sent ties and stress for victims, I added the coefficients for the interaction effect and the number of sent ties, then exponentiated the results (Long and Freese, 2014). This calculation indicates that for every one-unit increase in the number of sent ties ($p<.001$), victimized women's odds of being in a higher stress category are reduced by 58.7%. In contrast, every one-unit increase in the number of sent ties is associated with the odds of being in a higher stress category, increasing by 37.6% ($p<.001$) among the non-victimized women.

Thus, while perceptions of social integration appear very beneficial for women experiencing in-prison victimization as anticipated, they seem to be associated with increased stress for non-victimized women. Although speculative, this result could indicate that among non-victimized women, perceiving having more friends in one's network, especially in a context of deprivation, may increase the burden of caretaking and trying to resolve stress-inducing experiences of those you consider friends. On the other hand, inmates who experienced violent victimization within prison may perceive

[11] The range for number of sent ties for non-victims included zero, whereas the range for victims did not. Therefore, for ease of interpretation, the interaction effect is interpreted at the number of sent ties at the mean.

greater benefits of building their social support network as it could provide critically needed resources enabling victims to process victimization experience, develop strategies for avoiding victimization, and potentially provide sources of protection against re-victimization. I elaborate on these findings in the discussion.

Model 3 also provides evidence that being perceived as a friend by others (receive-ties) is associated with reduced stress. For instance, a one-unit increase in the number of "get along with" ties received by respondents reduces the odds of being in a higher stress category by 13.3% ($p<.01$) [12]. Age continues to be associated with lower levels of stress, while increasing time spent incarcerated is associated with greater levels of stress.

Beyond odds ratios, predicted probabilities from model 3 can further elucidate the relationships between the variables of interest and stress categories. Figure 1 shows the predicted probabilities for stress level by prison victimization status. As illustrated, non-victims show a higher probability of "never" being stressed compared to women who have experienced in-prison victimization. Furthermore, women who have not been victimized in prison are more than three times as likely to fall into the "rarely stressed" category than victims. Overall, both victims (39%) and non-victims (45%) are most likely to report feeling "sometimes stressed" than other stress categories, holding all other variables constant ($p<.001$). Finally, women who experienced

[12] Given the significant relationship between received social support and stress, I also tested the interaction between received social support and victimization on stress outcomes. However, I did not find evidence of a significant interaction here.

prison victimization are more than five times as likely to report being in the highest stress category compared to non-victims, illustrating the vastly heightened stress of victims.

A likelihood ratio test finds the addition of the interaction term to improve model fit, suggesting the interaction between victimization in prison and the number of sent ties is significant ($p<.001$). To aid with the interpretation of the interaction, I also compute predicted probabilities of respondents falling into each of the four stress levels across the number of nominated people they "get along with" by victimization status, which is illustrated in Figure 2. Of the women in the prison unit, those who were victimized in prison are statistically unlikely to be in the lowest stress category (i.e., among women that reported "never being stressed"), regardless of perceived social connections (recall that in my sample, Table 2 showed that victimized women never reported feeling "never being stressed"). Women not experiencing victimization during their current incarceration had a considerably higher probability of saying they were "never stressed" up to 25 sent connections.

Examining the predicted probabilities for respondents experiencing stress "rarely" illustrates that non-victimized women are more likely to fall into this category up until 16 friendship nominations, after which there are no statistically significant differences in the probability of placing in this stress category across victimization status. Among the victimized women, perceiving more social connections to other inmates results in a higher likelihood of falling into this lower stress category.

When the focus is on a higher stress category (feeling stressed sometimes), the association between victimization experience and social connections indicates that

women in prison have a high probability of falling in this category, regardless of victimization status. Recalling the descriptive statistics, 39% of the sample reported feeling stressed some of the time. Given the highly stressful context of prison, it is not surprising that women tend to report feeling stressed "sometimes." Though a curvilinear effect appears to be present, the confidence intervals all overlap, suggesting there is no significant difference for the likelihood of falling into this stress category across sent ties.

Last, examining the association between victimization status and perceived social connections for the highest stress category (women reporting feeling stressed "most of the time"), Figure 2 shows that women who were not victimized in prison have a notably low probability of reporting feeling stressed "most of the time", an effect consistent across the range of friendship ties. In contrast, women experiencing in-prison victimization have higher probabilities of experiencing high stress "most of the time" when they perceive fewer social ties in their networks. Conversely, as the number of perceived social relationships increase, the probability of reporting high stress most of the time quickly declines among the group of women reporting victimization. After 16 sent ties, there is no statistical difference between the probability of falling into this stress category across victimization status. Altogether, these results highlight the particularly important role of perceived social networks for incarcerated women who experience in-prison violent victimizations. For these women, the more extensive their social network, the less likely they are to report high levels of stress (and the more likely to report stress "rarely"). In contrast, victimized women without social connections are most likely to report the highest levels of stress.

Chapter 5. Discussion

Although a large body of research points to in-prison victimization as a particularly negative environmental aspect of prison, little research has examined the extent to which experiences of in-prison victimization are associated with experiences of stress, especially among women. Furthermore, up to this point, no research has empirically examined whether in-prison social networks can buffer the amount of stress experienced by victimized women. Using new data from a Pennsylvania women's minimum-security prison, my study is the first to examine the association between in-prison social ties and perceptions of stress, and to examine whether social networks buffer the negative effect of experiences of violent victimization on inmate's perceptions of stress. Thus, my study accomplishes three goals: I evaluate (1) whether there is a negative association between in-prison victimization status and incarcerated women's perceptions of stress, (2) whether social support networks are associated with lower levels of stress experienced by female inmates, and (3) whether social support networks moderate the association between in-prison victimization and perceptions of stress among incarcerated women.

Overall, my findings revealed a positive association between experiencing in-prison victimization and incarcerated women's perceptions of stress. At the bivariate level, I find victims report significantly greater perceptions of stress compared to

incarcerated women who were not victimized while imprisoned. Multivariable analyses indicate that the higher stress reported by victims persists net of controls, including pre-incarceration victimization, with women victimized in prison far more likely to report experiencing the highest category of stress (i.e., feeling stressed "most of the time") compared to their non-victim peers. As expected and consistent with prior research on male prisoners (Hochstetler et al., 2004; Listwan et al., 2010; Wooldredge, 1999), in-prison victimization is a highly salient stressor for incarcerated women.

Contrary to my expectation, perceiving greater social connections with other inmates (i.e., the number of inmates the respondent nominates as friends (sent-ties) in general, is not associated with inmate reports of lower stress. However, the number of other inmates that view the respondent as a friend (received social ties) is negatively associated with reports of stress among incarcerated women. Last, I considered whether greater social connections to other inmates would be particularly important for victimized inmates and operate to buffer the adverse effects of victimization on women's reports of stress. The findings provide support for this expectation. As hypothesized, victimized women who perceived greater social connections to others within the prison experienced much lower levels of stress in comparison to victimized women lacking these connections. Also, probability analyses indicate that women who were victimized in prison are far less likely to be in the highest stress category (i.e., reporting feeling stressed most of the time) as their connections to other inmates increased.

It is also worth noting that the findings reported here contrast with those of Listwan and colleague's (2010) results, who found no evidence that among male inmates,

perceived social support moderated the impact of experiencing prison coercion (comprised from a scale including in-prison victimization) on inmate psychological well-being. However, it is important to keep in mind that Listwan et al.'s study was not designed to evaluate whether in-prison social integration buffers the effect of victimization on the perceptions of stress while incarcerated because they measured social connections and psychological well-being after the incarcerated men were released from prison.

Beyond Listwan et al.'s (2010) study, it is worth considering how gender socialization and norms shape the experiences and needs of inmates and likely lead to gender differences in the importance of social connections for inmates' well-being and perception of stress. Among male inmates, where prison culture emphasizes norms of masculinity, toughness, and self-reliance, social support may be far less important for male inmates' well-being during incarceration (and perhaps even detrimental) than it is for female inmates where gender norms encourage care-taking and looking out for others.[13] Furthermore, because female inmates seem to experience more pain caused by the separation from family, especially children, compared to male inmates, incarcerated women may be more likely to turn to other inmates to fulfill their relationship needs. Finally, thinking about gender norms and how others perceive victims, it is likely much more difficult for male victims to forge positive relationships with other inmates as a

[13] Although, recent research by Hayne and colleagues (2018) found incarcerated men with greater connections to others reported better mental and physical health compared to their non-connected peers. Unfortunately, this study did not include a measure of victimization or stress so it remains unclear whether and how incarcerated men's victimization status would shape their ability to form ties with other inmates and/or whether victimization shaped men's perceptions of stress

result of masculinity norms (where friendship with a victim is perceived as an indicator of weakness). In contrast, there is likely less stigma attached to female victims (especially considering the pervasiveness of victimization experiences among female inmates), making it much easier for incarcerated women to establish positive connections with other inmates. For female victims, in particular, social support networks may be especially important for preventing re-victimization by providing information resources and protection against potential offenders.

My findings provide mixed support of Durkheim's (1951) theory of integration and anomie. Positing increased social integration reduces feelings of anomie and enhances wellbeing; I argued in this study that social integration is especially important for prisoners. This increased importance is because the institution of prison is specifically designed to sever and isolate inmates from their prior social connections and punish past offenses by stripping prisoners of their autonomy, liberty, and humanity, all conditions which promote feelings of anomie among prisoners. Thus, the ability to forge connections with other inmates experiencing similar deprivations is one mechanism that prisoners may use to reduce feelings of anomie and provide them with greater structure and purpose, which in turn should reduce feelings of stress.

While I find greater numbers of perceived social ties reduces stress for women victimized in prison, I see some evidence of an inverse effect for women who were not victimized. That is, among non-victimized women, there is some evidence that perceiving larger support network increases the probability that women will report higher levels of stress compared to non-victimized inmates who report smaller support networks. Though

this finding is contrary to most social support literature, a recent study by Greer (2016) suggests one potential reason for finding a positive association between larger social support networks and increased stress among non-victimized women could be due to increasingly volatile relationship dynamics characterizing relationships among female prisoners. Also worth considering is that having larger support networks can potentially increase women's stress if they feel responsible for supporting inmates experiencing problems (such as those experiences of victimized women). Further research is needed to better understand why perceptions of larger social support networks tend to benefit victimized inmates but result in greater stress for non-victimized inmates.

My findings reveal that among victimized inmates, social integrations, and greater connections to other inmates were especially important and operated as expected to reduce women's perceptions of stress. To my surprise, social integration appeared less beneficial for non-victimized incarcerated women in my sample. Although speculative at this point, I suggest that increasing social connections to other inmates may have both positive and negative consequences for inmates, and my findings for victimized women reveal that they likely perceive and receive greater benefits from their friendship networks than do non-victimized women. In particular, victimized women may receive greater emotional support and protection from future victimization, the larger their social network of ties. In comparison, non-victimized women may feel increased burdens associated with larger friendship networks if they are providing a caretaking or emotional support role within these relationships. Future research would need to ask additional

questions about the nature of the relationship when collecting social network data, to evaluate this possibility.

Implications

Given the dearth of research on the subject of my study (i.e., whether and how social networks within prison buffer against the stress-producing impact of experiencing in-prison victimization among female inmates), my findings have significant implications. Within the context of corrections policy and practices, my results suggest a two-fold need for change. First, given the detrimental impact of within-prison experiences of victimization on incarcerated women's perceptions of stress, administration efforts should place a greater emphasis on monitoring for and reducing in-prison victimization. Second, my finding that social ties can buffer the impact of in-prison victimization on stress, incorporating prison programming that directly addresses victimization and promotes social integration and bonding for incarcerated women, especially those women with extensive histories of victimization may help to reduce stress and lead to an environment more conducive to rehabilitation.

More broadly, stress is routinely found to be detrimental to the subsequent life-course of those experiencing high-stress burdens, with high instances of stress leading to worse health outcomes (Ganzel, Morris, & Wethington, 2010; McEwen, 2012; Prior, Manley, & Jones, 2018), such as reduced physical functioning (Gruenewald et al., 2009; Szanton et al., 2008; Seeman, 1997), reduced mental health (McEwan, 2012; Seplaki et al., 2006; Seeman, 1997), and chronic diseases, including hypertension, arthritis,

diabetes, obesity, and cardiovascular disease (Jimenez et al., 2015). In his 2008 study, Massoglia compared the health outcomes between individuals who had previously been in prison to those with no incarceration history. He found the only health outcomes significantly more prevalent for incarcerated individuals were stress-related illnesses and diseases, suggesting negative health effects of stress are particularly salient for incarcerated populations. Women in prison have more medical problems than their male counterparts (Maruschak, 2008), indicating this effect may be particularly salient for female prisoners. Subsequent research is needed to explore the relationship between women's stress in prison as a potential mediator for their detrimental health outcomes.

In addition to these implications, articles researching prisoner experiences seldom focus on female populations. By exploring victimization as a stressor in woman's prisons, my contribution adds to the much-needed discussion of stress within women's prisons. Future research should continue to explore this topic by considering including other causes of prison stress as well as consider whether and how other incarceration experiences could buffer against women's stress while incarcerated. Furthermore, my study was limited to a focus on physical/sexual violence, although prior studies emphasize the high prevalence of verbal aggression and disputes among incarcerated women (Trammel, 2009; Wooldredge & Steiner, 2016). Therefore, future research needs to explore the association between non-physical and physical victimization and stress within female prisons.

As always, it is important to keep in mind some limitations of my study when discussing implications. My sample was collected in a single Pennsylvania state women's

prison. Thus, my findings may not be generalizable to states with other prisoner demographics or other prisons within the state. Moreover, data collection focused on inmates in a good behavior unit, where respondents were selected to reside in the unit based on their willingness to follow institution rules and staff direction in the year preceding their move to the unit (although the unit includes women with severe offenses, including women with life sentences). Furthermore, although experiences of in-prison victimization in my sample are consistent with prior estimates, the amount of stress and the number of social connections to other inmates are likely higher in a "good behavior" unit than they would be in a general population unit. Therefore, the data may not be representative of the other units within the prison under study and other prisons more broadly. Last, I am unable to establish causal relationships between experiences of victimization, social integration, and women's perceptions of stress, which would require longitudinal data where temporal order between measures can be identified. While my findings demonstrate expected associations between concepts consistent with my hypotheses, further longitudinal research is needed to assess the causal relationship between victimization, integration, and stress.

These limitations are necessary compromises, considering the strengths of my study. Data within prisons is challenging to attain due to their restricted nature and the protective rights of prisoners, making data collection within prisons rare and invaluable. Furthermore, restricting my sample to one unit in prison allowed us to collect almost complete network data, which requires having every individual within the sample

participate in the study. Thus while my sample is relatively small, we can more accurately measure concepts such as social integration

Having social network data, surveys, and administrative data for a unit of female inmates incarcerated in a medium-security prison provides unprecedented insight into this often invisible population (Belknap, 2001). Given the highly stressful contexts of prisons, it is valuable to identify and examine aspects of prison life that contribute to the stress-climate. My study illuminates multiple areas that prison administrators could focus on that would reduce the stress experienced by female inmates (e.g., additional prevention measures directed at reducing prison victimization, social support programming for women who experienced victimization in prison) and, in turn, have the potential to improve health and well-being not only in the short-time but also potentially improve health and well-being in the long term following women's re-entry into society.

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Appendix A: Tables

Table 1. Descriptive Statistics, Incarcerated Women Unit 1 (N=104)

	Mean, %	SD	Range
Stress level	2.63	.90	1-4
Prison Victimization (%)	27.88		
Perceived social ties (sent ties)	11.72	13.17	0-69
Received social ties (received ties)	9.99	5.20	1-25
Age	46.79	12.21	24-77
Non-white (%)	40.38		
Years in prison	10.37	9.88	1-36
Education	12.03	1.52	7-16
Pre-prison victimization (%)	55.77		
Childhood victimization (%)	54.81		

Note: SD = standard deviation

Table 2. Descriptive Statistics, by Incarcerated Women's Victimization Status (N = 104)

	Victimized in prison (N= 28)			Not victimized in prison (N=76)			
	Mean (%)	SD	Range	Mean (%)	SD	Range	t-test
Stress level	3.25	.75	2-4	2.41	.85	1-4	-4.611***
Never (%)	0			17.11			2.381*
Rarely (%)	17.86			31.58			1.384
Sometimes (%)	39.29			44.74			.494
Always (%)	42.86			6.58			-4.881***
Perceived social ties (sent ties)	15.75	13.38	3-51	10.24	12.87	0-69	-1.918*
Received social ties (received ties)	10.32	4.63	1-20	9.87	5.41	1-25	-.393
Age	45.83	12.12	24-68	47.16	12.31	24-77	0.561
Non-white (%)	39.29			40.79			.137
Years in prison	11.55	9.44	1-36	9.91	10.07	1-36	-.418
Education	12.41	1.27	10-16	11.88	1.59	7-16	-1.639
Pre-prison victimization (%)	78.57			47.37			-2.931**
Childhood victimization (%)	71.43			48.68			-2.091*

Note: SD = standard deviation
*=p<.05 **=p<.01 ***=p<.001

Table 3. Ordinal Logistic Regression of Stress Levels, Incarcerated Women

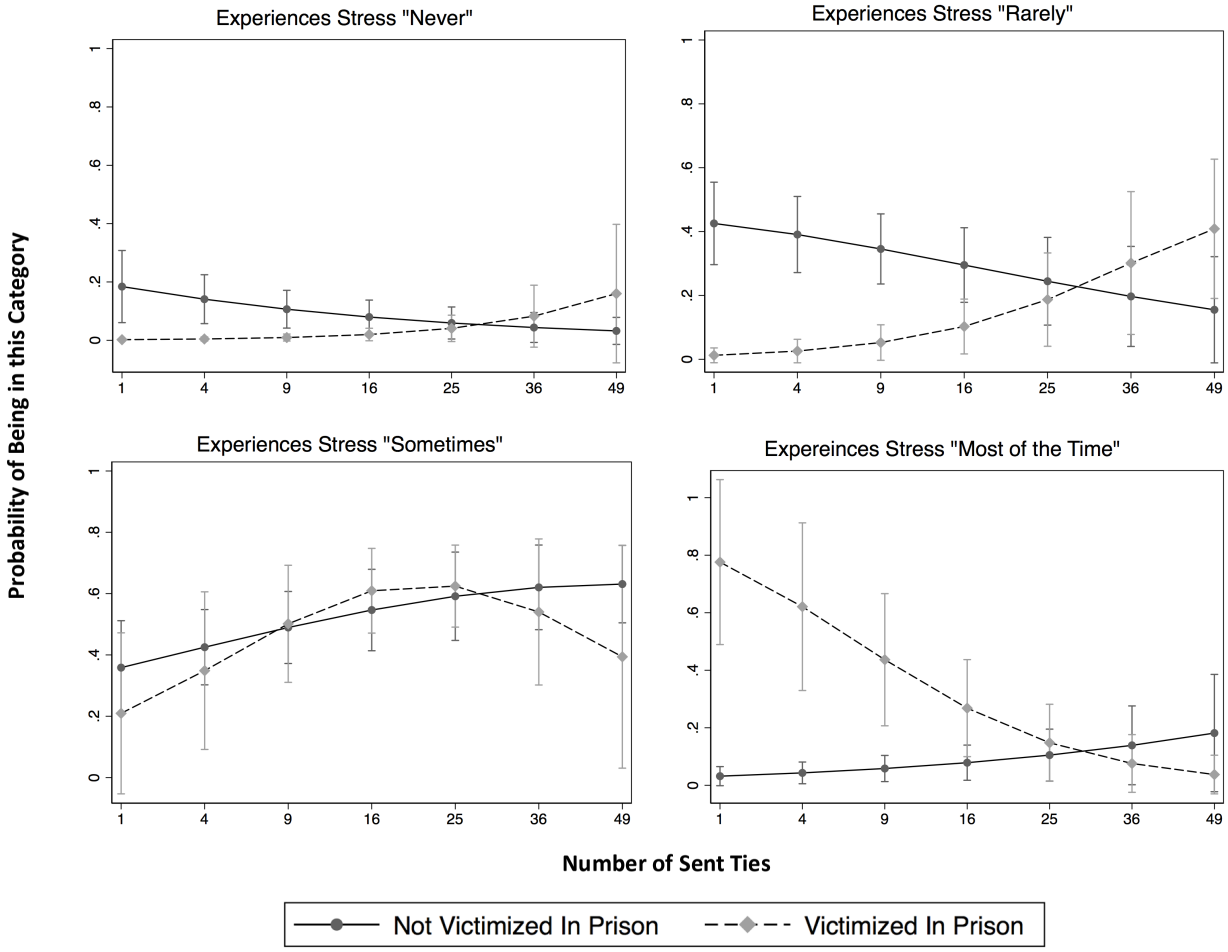
	Model 1		Model 2		Model 3	
	Beta (SE)	Odds Ratio	Beta (SE)	Odds Ratio	Beta (SE)	Odds Ratio
Prison Victimization	1.880*** (0.497)	6.550	1.749** (0.508)	5.746	2.521*** (1.307)	12.440
Perceived social ties (sent ties)	0.088 (0.136)	1.092	0.069 (0.137)	1.071	0.319*** (0.153)	1.376
Received social ties (received ties)	-0.124** (0.042)	0.883	-0.127** (0.042)	0.881	-0.142** (0.044)	.867
Age	-0.050** (0.018)	0.951	-0.046* (0.019)	0.955	-0.043* (0.019)	.958
Non-white	-0.014 (0.419)	0.986	0.013 (0.424)	1.013	-0.106 (0.430)	.900
Years in Prison	0.062* (0.026)	1.064	0.059* (0.026)	1.061	0.074** (0.027)	1.077
Education	0.225 (0.135)	1.252	0.233 (0.138)	1.262	0.213 (0.139)	1.238
Pre-prison victimization			0.444 (0.406)	1.559	0.376 (0.410)	1.456
Childhood victimization			0.187 (0.384)	1.206	0.077 (0.393)	1.080
Perceived ties * In-prison victimization					-1.068*** (0.304)	.343
Cut-point 1	-1.914 (1.744)		-1.400 (1.820)		-1.075 (1.854)	
Cut-point 2	-0.057 (1.740)		0.463 (1.823)		.859 (1.860)	
Cut-point 3	2.551 (1.752)		3.107 (1.842)		3.833 (1.896)	

*=p<.05 **=p<.01 ***=p<.001

Appendix B: Figures

Figure 1. Predictive Probabilities of Stress level by Victimization Status

Figure 2. Predicted Probabilities for Each Stress Level, by Victimization Status and Perceived Social Ties



Note: As the variable " Sent Ties" underwent a square root transformation for our analysis, we squared the values in the x-axis. This allows for the x-axis to be interpreted as the number of sent ties. However, it is important to note this transformation means the distance between each axis tick is not equidistant.

Appendix C. Variable Operationalization

Variable	Description	Measurement
Stress level	A four-item scale indicating the level of stress respondents reported having.	Women in the unit were asked how frequent they experienced stress. They were able to select between never (1), rarely (2), sometimes (3) and most of the time (4). The higher the number in the scale, the greater the stress level of the respondent.
In prison victimization	A dichotomous measure of whether or not the respondent experienced victimization while in prison	Respondents were coded as 1 if they experienced violent or sexual victimization while in prison.
Number of sent ties	A continuous measure of the number of ties sent to other peers on the unit, ranging from 0-69.	Respondents were asked to go down a roster and select all peers on the unit they "get along with." Each of these nominations constitute one sent tie.
Number of received ties	A continuous measure of the number of ties received from other peers on the unit, ranging from 1-25.	Respondents were asked to go down a roster and select all peers on the unit they "get along with." If a peer selected the respondent, that would constitute one received tie.

Age	Age recorded in their prison administration document.	Age was measured in decimals and was rounded to the lower year.
Non-white	Binary measure of race.	If a respondent identified as black, Hispanic, or Asian they were coded as 1, with whites serving as the reference category.
Years in prison	A continuous measure of the number of year a respondent has been in the Pennsylvania department of corrections, as recorded on their prison administration file.	
Years of education	A continuous measure of the years of education completed by respondent, as recorded on their prison administration file.	The one missing value in this variable was coded to the median year of education completed.
Victimized 12 months prior to incarceration	A dichotomous measure of whether or not the respondent experienced victimization within the 12 months prior to incarceration.	Respondents were coded as 1 if they experienced violent or sexual victimization within the 12 months prior to incarceration.
Victimized in childhood	A dichotomous measure of whether or not the respondent experienced victimization during their childhood.	Respondents were coded as 1 if they experienced violent or sexual victimization during their childhood.