The Consequences of Mixed-Sex Peer Groups in Adolescence and Young Adulthood

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A dissertation submitted in partial fulfillment of the

requirements for the degree of

Doctor of Philosophy

University of Washington

2021

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Dissertation Summary

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This dissertation is divided into three chapters. Chapter I finds adolescents with violently delinquent peers are more likely to report mixed-sex peer groups, but adolescents who are themselves delinquent are less likely to report mixed-sex peer groups. Chapter II finds heterosocial adolescents are more likely to drink underage. Heterosocial histories decrease drug use risk among young adults with many drug-using peers, and increase drug use risk among young adults with few drug-using peers. Chapter III explores associations between adolescent peer group sex composition and occupational outcomes. Formerly heterosocial adolescents are more likely than their homosocial counterparts to work in sex-incongruent occupations, and in sex-congruent fields characterized by a high degree of sex segregation.

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CHAPTER 1:

Mixed-Sex Peer Groups, Delinquency, and Peers' Delinquency

How the sex composition of adolescent peer groups predicts and is predicted by property crime and violent delinquency

Abstract

Few studies focus on how or why same- versus mixed-sex peer groups influence delinquent behaviors among adolescents, despite evidence across criminological studies indicates peer group sex composition is an important correlate of delinquency, and the fact that transitions from the same-sex peer groups of childhood to mixed-sex peer groups in adolescence is normative. I borrow from theories on adolescent development, interaction, and deviance to examine the relationship between and among peer group sex composition and delinquency. Using longitudinal data from the Denver Youth Survey, I find peers' violent delinquency increase the probability of reporting a mixed-sex peer group, and respondents' violent delinquency decreases the probability of reporting a mixed-sex peer group. Mixed-sex peer groups are, in turn, associated with increases in respondents' violent delinquency and decreases in property crime. These associations remain when controlling for shared correlates of mixed-sex peer groups and delinquency.

Introduction

Adolescence is characterized by an increased risk of engaging in illicit activities (Steffensmeier et al. 1989), and significant changes in the composition of peer groups in terms of their sex composition and peers' behavior (Maccoby 1998; Monsour 2002). In criminology, the influence of peers and peer groups on delinquency is a heavily studied topic (Hirschi 1969; Matsueda 1982; Sutherland, Cressey, and Luckenbill 1992), as are the influences of individual sex and gender norms. (Lauritsen, Heimer, and Lynch 2009; O'Neill 2020). However, the same cannot be said of the effects of peers' and peer groups' sex composition on delinquency. Relative to childhood, contact with other-sex peers increases substantially in adolescence, and other-sex friendships are both common and normative among older teenagers (Kuttler, Greca, and Prinstein 1999; Mehta and Strough 2009, 2010; Monsour 2002). While much of this other-sex contact is related to the pursuit of romantic and sexual relationships—which are in turn associated with delinquency (Haynie et al. 2005; Kreager and Haynie 2011)—most other-sex interactions among adolescents occur outside of intimate partnerships.

Other-sex interactions are uniquely functional in the course of adolescents' behavioral development, in that newly heterogenous peer groupings create spaces to practice behaviors previously constrained in same-sex environments (Maccoby 1998; Monsour 2002; Thorne 1993). Adolescent delinquency is likely one of several behavioral patterns shaped by these dynamics, and research suggests a linkage between the sex composition of adolescent peer groups and delinquency (Kreager and Haynie 2011; Mrug, Borch, and Cillessen 2011; Warr 2002). However, we know little regarding why or how the sex composition of adolescent peer groups influence delinquent behaviors. Complicating this picture is the fact that delinquency is associated with many things that are also associated with mixed-sex peer groups, such as peers'

delinquency and onset of sexual activity (Grasmick et al. 1996; Harden and Mendle 2011; Haynie and Osgood 2005; Warr 2002). These associations make it difficult to determine the independent effect of the sex composition of adolescent peer groups and the correlates thereof. The current study disentangles these effects in order to speak to the influence of peer group sex composition on delinquency, net of other factors.

Using longitudinal data on individual and peer characteristics and behaviors, I explore the relationship between peer group sex composition and delinquency in two parts: first, by examining the shared correlates and predictors of mixed-sex peer groups and delinquency such as self-reports of prior delinquency, peers' delinquency, and sexual/romantic activity; and second, by showing these correlates and predictors do not erase the effect of mixed-sex peer groups on property crime or violent delinquency. I find that while mixed-sex peer groups and delinquency share many correlates, a direct relationship between mixed-sex peer groups and delinquency remains when taking these associations into account. These findings indicate that while the precise effects of mixed-sex peer groups on delinquency may have been obfuscated in prior research, membership in mixed-sex peer groups predicts delinquency.

The Emergence of Mixed-Sex Peer Groups in Adolescence

Existing literature suggests several a number of factors emerge in adolescence that lead to the formation mixed-sex peer groups. Qualitative research suggests young adolescents often experience a few false starts at other-sex friendship wherein platonic overtures are misunderstood or rejected, and some adolescents may only maintain other-sex peer groups as a means to access heterosexual partners (Maccoby 1998; Thorne 1993). In this way, the shift from same- to mixed-sex peer groups is more likely to be marked by a gradual push/pull in and out of adolescent peer groups than by sudden and permanent entrance into mixed-sex spaces. Still,

scholarship on adolescence and other-sex friendship indicates most adolescents will – at least for a time – have an other-sex friend in their peer network (Kalmijn 2002; Mehta and Strough 2009), although people generally exhibit preferences for same-sex friends on the whole (Rose 1985). Regardless, young adolescents are generally thought to gravitate to other-sex peers out of sexual and/or romantic interest or curiosity (Mehta and Strough 2009), though non-heterosexual individuals also experience the "pull" of other-sex friendship in adolescence (Maccoby 1998:191). In addition, opportunities for other-sex interaction and friendship formation generally increase in adolescence as familial, extracurricular, and school contexts increasingly facilitate gender-integrated activity. Finally, as individual personalities and interests become more variegated, so too do peer sorting mechanisms. As a result, while sex and gender remain salient in peer selection, they may not always be the primary concern in decisions regarding friendship and peer groups, particularly among delinquent adolescents whose motivation to offend may drive them to seek peers who share their delinquent proclivities (Gottfredson and Hirschi 1990).

While it is possible delinquency and peer group sex composition are associated only vis-à-vis shared correlates, research on peers, crime, and antisocial behavior supports at least some direct association between changes in peer group sex composition and adolescent delinquency. For example, criminological research on peers long operated under the assumption that juvenile delinquency was a consequence of boys and their all-boy peer groups. This assumption was supported by the finding that most delinquency is committed by boys, and most group-perpetrated delinquency is committed by groups of boys (Cohen 1955; Sutherland et al. 1992). However, while group-perpetrated delinquency is predominantly executed in all-boy groups, individual boys in these groups often have mixed-sex peer networks that extend past their partners in crime (Warr 2002). Further, increases in the frequency and coverage of girls'

delinquency indicates mixed-sex peer groups may be uniquely criminogenic for girls, particularly early-maturing girls (Caspi et al. 1993; Haynie 2003). While prior research suggests delinquent peers and histories are independently associated with the sex composition of adolescent peer groups and delinquency, few researchers have directly analyzed the association between peer group sex composition net of delinquent peers and offending histories (i.e. exposure to delinquency), or sexual and romantic activity. As a result, the effects of these correlates may be inflated in research that ignores the sex composition of adolescent peer groups, while the effects of adolescent peer group sex composition on delinquency have been overlooked.

A challenge in understanding the consequences of mixed-sex peer groups is prior research's overwhelming focus on the consequences of heterosexual pairing rather than the overall sex composition of peer groups (Monsour 2002). As a result, what we know about how mixed-sex peers influence delinquency is contextualized using information on intimate relationships rather than platonic ones, rendering the effects of other-sex intimacies and friendships on delinquency difficult to disentangle. Existing studies do, however, offer glimpses into the significance of mixed-sex peer groups in the lives of adolescents. For example, adolescents in heterosexual relationships actively cultivate mixed-sex peer groups in order to maximize time spent with partners, and may be uniquely susceptible to the influence of their partner's other-sex peers (Kreager and Haynie 2011). Boys and men report curbing antisocial behaviors at the behest of female partners (Giordano, Longmore, and Manning 2006; Laub and Sampson 2006; Sampson, Laub, and Wimer 2006), while girls with male partners are more likely to engage in delinquency (Caspi et al. 1993; Chesney-Lind and Pasko 2013). Despite this research's focus on intimate dyads, findings suggest mixed-sex peer groups exert a unique influence on adolescent behavior.

Unfortunately, few studies specifically account for peer group sex composition in their analyses, which means the effects of mixed-sex peer groups and intimate relationships are likely conflated in both theoretical and empirical evaluations of their associations with delinquency. A goal of this research, therefore, is to provide information on other-sex contexts above and beyond intimate dyads.

Using longitudinal data, I disentangle some of the sorting mechanisms that predict entrance into mixed-sex peer groups from these mechanisms' probable effect on delinquency. The present study focuses on two questions: *How does exposure to delinquency (i.e. self-reported delinquency and delinquent peers), and romantic and sexual activity influence peer group sex composition? and How does peer group sex composition influence delinquency net of these factors?* By disaggregating the effects of peer group sex composition from the sorting mechanisms that lead to these peer groups in the first place, this research adds important context to findings on how and why expanding adolescent peer networks contribute to delinquency.

Mixed-Sex Interactions and Delinquency

Given prior findings, it is reasonable to expect delinquent peers and self-reported delinquency (i.e. "exposure to delinquency") are associated with mixed-sex peer groups, and those expectations are empirically supported. More significantly, however, this research contextualizes the interplay between delinquency and mixed-sex peer groups by testing the hypothesis: *mixed-sex peer groups are a significant predictor of delinquency net of their shared correlates.* Criminological literature understandably privileges the influence of delinquent behavior and delinquent peers in explanations of peer group characteristics and future delinquency. Delinquent peers encourage delinquent behavior, and delinquent youth gravitate towards delinquent peers. Sutherland's theories of differential association and organization, for

example, argue delinquent and criminal behaviors arise when individuals learn an "excess" of definitions favorable to crime, and/or are embedded in groups organized in favor of crime (Matsueda 1982, 2006; Sutherland et al. 1992). Where Sutherland's framework suggests peer associations *cause* delinquency, social control theories argue delinquent peer associations are caused *by* delinquency. Youths' predispositions towards delinquency are partly a consequence of their own weak attachments to prosocial others who may control their behaviors. As a result, these youths seek out peers who are unlikely to reject them for engaging in delinquency, at the expense of forgoing the strong social ties characteristic of prosocial peer groups (Gottfredson and Hirschi 1990; Hirschi 1969). Both differential association and social control theories center the role of peers in explanations of delinquency, and suggest movement between and among peer groups is associated with delinquency. Neither framework, however, explains how or why changes in peer groups sex composition in adolescence may or may not facilitate delinquency.

Recent literature indicates that while group-perpetrated delinquency is often executed by all-boy groups, individual boys in these groups often have mixed-sex peer networks (Warr 2002), and girls' overall delinquency has increased in terms of both its frequency (Sentencing Project 2018) and research coverage (Chesney-Lind and Pasko 2013). To this end, the differential influence of same- versus other-sex peers on boys' and girls' delinquency has recently received more attention, though the magnitude and directionality of this association remains unclear. Girls and boys may be differentially susceptible to peers' influence based on the sex of those peers. Agnew and Brezina (1997) for instance, find positive, low-strain relationships with other-sex peers increase delinquency among adolescents, implying mixed-sex peer groups may be criminogenic. Further, while positive relationships with girls are not associated with delinquency for girls, they are associated with delinquency increases among boys. The authors theorize this is

because girls navigate interpersonal conflict more effectively, and are therefore less likely to encourage offending among peers or to respond to strain with delinquency. This theory is supported in the work of Piquero et al., who find boys are more susceptible to delinquent peers than girls (2005), and Giordano et al. who argue that "differential dynamics within [same-sex] networks… amplify delinquency in the case of boys but generally inhibit it among girls" (1986:1194). As discussed below, however, some studies suggest this assumption should be qualified.

The influence of mixed-sex peers may differ based on individual characteristics and the environments in which these relationships form. For example, early-maturing girls may be uniquely susceptible to the influence of delinquent boys (Haynie 2003; Stattin and Magnusson 1990), but only in contexts where mixed-sex socialization is facilitated by the school environment (Caspi et al. 1993). Conversely, others have found a certain degree of mixed-sex socialization inhibits delinquency. Faris and Felmlee, for instance, find other-sex friendships decrease adolescents' aggression in schools with low levels of informal gender segregation where mixed-sex peer groups are common and structural barriers to such relationships are limited (2011). However, the same study found other-sex peers increase aggression in schools with high levels of informal gender segregation. These findings indicate the meaning of other-sex friendships varies per the social structures in which they are embedded, and that structural changes can generate substantial behavioral change in regards to delinquency and peer grouping.

Love, Sex, and Delinquency

The most common angle in studies on other-sex peers and delinquency is to focus on heterosexual pairing. In such studies, other-sex peer affiliation is a means to an end in that it lends itself to romantic and/or sexual debuts, which are considered important developmental and

social milestones with implications for a broad range of behaviors—including delinquency (Giordano et al. 2006; Mrug et al. 2011). Therefore, research on the gender composition of adolescent peer groups generally focuses on how newfound other-sex peers enable or suppress heterosexual pairing and activity (Mehta and Strough 2009, 2010), and, subsequently, antisocial behaviors (Caspi et al. 1993; Haynie et al. 2005; Kreager and Haynie 2011). Consequently, most of what we know about delinquency and other-sex peer affiliation in adolescence is contextualized relative to heterosexual pairings rather than other-sex friendships. As a result, other-sex friendships and intimate relationships are often conflated and their likely separate effects on delinquency and offending are left unspecified or ignored.

Notably, adolescent sexual activity has been argued to be both a correlate of delinquency (Armour and Haynie 2007; Kreager, Matsueda, and Erosheva 2010) and a delinquent behavior in and of itself (Felson and Haynie 2002; Matsueda 1992). Given such studies rarely control for the sex composition of peer groups, it is unclear whether sexual behavior or associations with other-sex peers drive upticks in delinquency. Further, the problematization of sexual activity and other-sex relationships is troubling given that while romantically-linked sexual activity in late adolescence (i.e. "on time") may be associated with decreased delinquency (Harden and Mendle 2011), post-adolescent (i.e. "late") sexual debut is associated with adult-onset criminal careers (Zara and Farrington 2009). These findings regarding the interplay between sexual activity and delinquency may be explained, in part, by adolescents' entrance into and maintenance of other-sex friendships. For instance, other-sex friendships create contexts in which adolescents may experience the healthy and platonic interpersonal interactions that also occur in the types of romantic relationships that ultimately inhibit delinquency and offending (Monsour 2002; Swain 1992).

Research specifically on romantic interactions indicates adolescents in romantic heterosexual partnerships are more likely to have mixed-sex peer groups than those who do not, though it is unclear whether this is a predictor or consequence of those relationships. Kreager and Haynie's work on the diffusion of drinking behaviors in peer networks finds that while heterosexual romantic partners influence drinking behaviors more than "one's own peers," friends-of-partners are more influential than the partners themselves (2011). The authors hypothesize adolescents are motivated to befriend their partner's (usually other-sex) friends, and to introduce them to their own (usually same-sex) friends to maximize time spent with partners. Unlike one's own peers, these friends-of-partners are not selected based on shared interests or proclivities, and are therefore more likely to "…expose [adolescent daters] to novel behaviors and opportunities that promote behavioral change." Further, incentive to change behaviors may be particularly strong because "the novelty of these peers is partly due to their being of the opposite sex and early gender homophily and socialization create distinctly gendered peer contexts" (Kreager and Haynie 2011:756). In other words, the introduction of other-sex peers into previously homophilous networks may be criminogenic because other-sex peers expose individuals to new, antisocial behaviors, and sexual and romantic activity increases the probability that adolescents' networks will expand to include other-sex peers. To this end, I examine the expectation that sexual and romantic activity predict mixed-sex peer groups. As with tests of expectations regarding delinquency and delinquent peers, I use confirmation of this expectation to set up my focal hypothesis: *mixed-sex peer groups are a significant predictor of delinquency net of their shared correlates.* Testing these expectations and hypothesis requires longitudinal data and methods, and I now turn to describing my approach.

Data and Methods

The Denver Youth Survey

The Denver Youth Survey (DYS) is a ten-wave longitudinal study of delinquency in "high-risk" Denver, Colorado neighborhoods, initiated in 1988. Wave 1 respondents range in age from 7 to 16. Interviewer-conducted surveys were administered annually in Waves 1-5 and 6-10, with a two-year break between Waves 5 and 6. Only adult surveys were administered in Wave 10. Respondents were given a child (ages 7-10), youth (ages 11-18), or adult (ages 18+) survey based on age and time since most recent interview (for more on sampling methodologies, see Huizinga 2017). Of 1,525 respondents in Wave 1, 1,067 remain in Wave 9, 260 of whom are age 18 or under. I limit analyses to youth respondents age 11 to 18 (i.e. adolescents) who completed youth surveys in Waves 1-9. In total, 96% of adolescent respondents and 79% of all person-year observations were eligible for inclusion in these analyses, and my final sample includes 1,430 adolescents and 5,058 observations. The average respondent is present in 3.5 survey waves, and up to six survey waves.

Respondents who do not have a peer group or provide data on their peer groups are not included in analyses. While these omissions limit the generalizability of this study, they allow for a more decisive interpretation of results as they relate to youth with peer groups, specifically. None the less, some differences between missing and non-missing observations are worth noting. T-tests (see: Table 1) show adolescents dropped from analyses are less likely to report romantic or sexual activity, more likely to report a new peer group in future waves, and feel less attached to their peers than do adolescents included in analyses. Such differences underscore the importance of not generalizing these results to friendless youths or youths without peer groups.

Measurements

DYS respondents were asked a series of questions regarding the peer group they had spent the most time with in the past year. In total, four variables were generated from this question set: *mixed-sex peer group*; *new peer group*; *peer group size*; and *peer attachment*. Missing values were carried forward for *mixed-sex peer group*, *peer group size*, and *peer attachment* using data from prior waves if, and only if, adolescents report they have not changed to a new peer group since the last survey period. The variable *mixed-sex peer group* was generated using responses to the question, "Are there boys and girls in your peer group?" with the options of "boys only"; "girls only"; or "both boys and girls". This variable, along with respondent sex, was used to generate a dichotomous measure of whether or not the respondent reports having a mixed-sex peer group in the current wave.

Many adolescents report the sex composition of their peer groups changes more than once, and research suggests new peers—particularly new other-sex peers—are uniquely influential on adolescent behaviors (Kreager and Haynie 2011). I therefore control for whether or not respondents report a new peer group in a given wave. Respondents were asked if they "got a new group of friends" within the past year. From these responses, I generated a dichotomous *new peer group* variable. I control for peer group size as larger peer groups generally increase the diversity of peers' characteristics, including peers' sex and delinquent behavior. Respondents were asked how many people were in their current peer group. Responses ranged from 1 to 500. The final *peer group size* variable was divided into quartiles using the percentage of respondents in a given peer group size range. For example, approximately 25% of respondents reported a peer group of 1-3 people, so a value of 1 indicates a 1-3 person peer group. Another 25% reported 4-5 people in their peer group, and so on. Analyses presented include this categorical variable, treated as a continuous measure. However, results of models using a series of dummy

variables indicating a respondents' peer group size are discussed as needed. Finally, I control for *peer attachment* using a measurement of respondents' agreement with the statement, "I feel close to my friends". This variable ranges in from 1 ("strongly disagree)" to 5 ("strongly agree"). As with *peer group size*, analyses presented include this categorical-as-continuous variable, and results of models using a series of dummy variables indicating respondents' peer attachment are discussed as needed.

Self-reports of the prior year's offending were used to generate four delinquency variables in two offending categories: *property crime* (property damage; breaking and entering; general theft; shoplifting; pickpocketing; theft from car; joyriding; grand theft auto) and *violent delinquency* (simple assault; aggravated assault; robbery; gang fighting; assault by throwing an object). Counts of *property crime* and *violent delinquency* are used as outcome variables in hypothesis tests, while a lagged, dichotomous measure captures whether any delinquency was reported in the prior wave. I use responses regarding *peers' property crime* and *peers' violent delinquency* to generate two measures of peer delinquency. Respondents were asked "how many of your peers have [engaged in behavior]?", responses range from 1 ("none of them") to 5 ("all of them"). Missing values were imputed using data from prior waves if, and only if, respondents report they have not changed to a new peer group since the last survey period. As with peer group size and peer attachment, analyses presented include this categorical-as-continuous variable, and results of models using a series of dummy variables indicating respondents' peer delinquency values are discussed as needed.

Romantically active is a dichotomous variable, where a value of 1 indicates respondents report romantic activity ("got a new boy/girlfriend"; "broke up with a partner"; "went on a date") in their survey wave, and a 0 if they do not report any romantic activity. Later youth and adult survey waves asked respondents to disclose age at first marriage, and 33 respondents reliably report having been married during the data collection period. These respondents are coded 1 for *romantically active*. Approximately 86% of all respondents report romantic activity at least once during the survey period. Respondents were also asked whether or not they have ever had sexual intercourse with a person of the opposite sex, or sexual relations with a person of the same sex. These responses were used to generate *sexual debut*, where a value of 1 indicates respondents

Table 1. Descriptive Statistics

Observations	*5,058*	
Individual Respondents	*1,430*	
	μ	SD
Focal Variables		
MSPG (0-1)	0.46[t]	-
Property Crime (0-1,658)	3.46	36.22
Violent Delinquency (0-1,999)	3.43	45.71
Peer Group Characteristics		
New Peer Group (0-1)	0.35[t]	-
Peer Group Size (1-4)	2.35[t]	1.11
Peer Attachment (1-5)	3.99[t]	0.72
Sexual and Romantic Activity		
Sexual Debut$_{(t-1)}$ (0-1)	0.57[t]	-
Romantically Active$_{(t-1)}$ (0-1)	0.61[t]	-
Exposure to Delinquency		
Any Property Crime (0-1)	0.32[t]	-
Any Violent Delinquency (0-1)	0.23	-
Peers' Violent Delinquency (0-5)	2.38[t]	1.20
Peers' Property Crime (0-5)	2.17	1.18
Background and Contextual Variables		
Age (11-18)	14.91	2.04
Female (0-1)	0.48	-
Hispanic (0-1)	0.50	-
Black (0-1)	0.32	-
Other Race/Ethnicity (0-1)	0.09[t]	-
White (0-1)	0.08	-
Income in 10,000s	1.79[t]	1.54

[t] Denotes significant differences in the mean for missing versus non-missing sample (i.e. t-test statistics greater than 1.96 or less than -1.96).

have engaged in sexual activity, and 0 indicates never having reported sexual activity. These responses were cross-checked using the questionnaire items: "how many times have you had intercourse/relations in the past year"; "at what age did you first have sexual intercourse/relations?"; and "how many sexual partners have you had in the past year?".

Finally, background and contextual controls were added to the models, including age, respondent sex, race and ethnicity, and household income. *Age* ranges from 11 to 18. Respondent sex is measured using a dichotomous *female* variable where 1 is female and 0 is male. Race and ethnicity are captured using self-reports of respondents' racial and ethnic identities. Using these reports, I generated four dichotomous variables for *Hispanic*, *Black*, *Other*[1], and *White* racial/ethnic categories. Analyses exclude *Hispanic*, the largest racial/ethnic category, as a reference category. Descriptive information is displayed in Table 1.

Model Selection

In total, 1,430 adolescents, (5,058 person-years) are included in analyses. Analyses on predictors of mixed-sex peer groups were conducted using logistic regression models with random intercepts to correct for observation interdependence. Given the focus on predicting mixed-sex peer groups, several measures are lagged at *t*-1 in these models, including mixed-sex peer group, sexual debut, romantic activity, property crime, and violent delinquency. Tests of this paper's hypothesis: *mixed-sex peer groups are a significant predictor of delinquency net of their shared correlates*, are conducted using negative binomial regression models with random intercepts. This model includes parameters to control for both overdispersion and observation interdependence. Given peer group sex composition may exert both short- and long-term effects

[1]This category includes respondents who identified as "other", as well as Asian, Indigenous, and multiracial respondents.

on delinquency, I include lagged (*t*-1) and contemporaneous measures of *mixed-sex peer group* in final analyses. Differential association and interactionist theories suggest peers gradually shape adolescent behaviors (Heimer 1996; Hochstetler, Copes, and DeLisi 2002; Sutherland et al. 1992) —a process that may not yield immediate behavioral change. Social control and developmental theories however, suggest peers' influence on delinquency is more immediate in that individuals predisposed to deviance must be "controlled" by peers in order to deter problematic behaviors (Gottfredson and Hirschi 1990; Moffitt 1993).

Results

Correlates of Mixed-Sex Peer Groups

Expectations regarding the relationships between mixed-sex peer groups and exposure to delinquency are generally supported, as seen in Table 2. Adolescents who do *not* report property crime or violent delinquency are more likely than their delinquent peers to report a mixed-sex peer group the following year, though this result is not statistically significant for property crime. This implies violent behavior in particular, rather than delinquent behavior in general, inhibits the ability or desire to enter and maintain mixed-sex peer groups.

Peers' property crime is unassociated with mixed-sex peer groups, whereas peers' violent delinquency increases the probability of reporting a mixed-sex peer group. The findings that adolescents who engage in violent delinquency are *less* likely to report mixed-sex peer groups, but adolescents with violently offending peers are *more* likely to report mixed-sex peer groups complicate standard peer-group formation narratives in which delinquents gravitate to delinquents (Hirschi 1969). If sorting into mixed-sex peer groups were simply a consequence of shared delinquent proclivities, we might expect mixed-sex peer groups to be positively associated with both self-reports of violent offending and peers' violent offending. However,

Table 2. Random Effects Logit Model: Entry into Mixed-Sex Peer Groups

Observations	5,058
Individual Respondents	1,430
Intercept	0.002*** (-7.25 – 5.61)
Peer Group Characteristics	
MSPG(t-1)	3.06*** (0.95 – 1.28)
New Peer Group	2.03*** (0.56 – 0.86)
Peer Group Size	1.89*** (0.56 – 0.70)
Peer Attachment	1.17*** (0.06 – 0.25)
Sexual and Romantic Activity	
Sexual Debut(t-1)	0.98 (-0.19 – 0.15)
Romantically Active(t-1)	1.18* (0.02 – 0.31)
Exposure to Delinquency	
Any Violent Delinquency(t-1)	0.78** (-0.42 – -0.08)
Any Property Crime(t-1)	0.89 (-0.26 – 0.02)
Peers' Violent Delinquency	1.16*** (0.08 – 0.02)
Peers' Property Crime	1.06 (-0.02 – 0.13)
Background and Contextual Variables	
Age	1.20*** (0.14 – 0.22)
Female	1.49*** (0.25 – 0.55)
Black	0.85 (-0.32 – 0.00)
Other Race/Ethnicity	1.18 (-0.08 – 0.41)
White	1.52** (0.14 – 0.70)
Income in 10,000s	1.04 (-0.01 – 0.10)
Fit Statistics	
Log-likelihood	-2826.764
Wald χ^2 (16)	883.83

*p≤0.05; **p≤0.01; ***p≤0.001
Coefficients displayed as odds ratios, confidence intervals in parentheses.
"Hispanic" excluded from analyses as racial/ethnic reference category.

these results can be interpreted to mean violent adolescents avoid mixed-sex peer groups rather than being ostracized from them, and indicate non-delinquent adolescents in mixed-sex peer groups tolerate violent behavior among their peers.

While romantically-active adolescents are more likely to report a mixed-sex peer group the following year than their inactive counterparts, sexual debut is unassociated with mixed-sex peer groups. These findings suggest researchers should be wary of conflating their influence on peer group selection and within-group interactions: though romantic and sexual activity are indisputably linked—in this sample adolescents who have had their sexual debut are much more likely to report romantic activity than those who have not—their influence on peer group sex composition is markedly different.

Notably, adolescents who report new or larger peer groups are much more likely to report a mixed-sex peer group, as are adolescents who report stronger attachments to their peers. Age, sex, race, and ethnicity are also associated with the sex composition of peer groups: older

adolescents, girls, and White adolescents are more likely to report mixed-sex peer groups than are their younger, male, and Hispanic counterparts.

Peer Group Sex Composition and Delinquency

The hypothesis that *mixed-sex peer groups are a significant predictor of delinquency net of their shared correlates* is generally supported. As seen in Table 3, contemporaneous mixed-sex peer groups are positively associated with violent delinquency, and prior histories of mixed-sex peer groups are negatively associated with property crime. These findings suggest the mechanisms through which mixed-sex peer groups influence delinquency are temporally-dependent, and differ depending on the type of delinquency in question. The implications of this finding are discussed in further detail in the final sections of this paper.

While the influence of mixed-sex peer groups on delinquency changes when additional controls and shared correlates are included, the association remains. In Model I, adolescents in mixed-sex peer groups the prior year commit 11% fewer property crimes the following year, while in Model II this effect increases to 17%. Contemporaneous reports of mixed-sex peer groups are unassociated with property crime, implying the effect of peer group sex composition on property crime accumulates over time. Other peer group characteristics are positively and significantly associated with property crime, and given it is possible these correlates of mixed-sex peer groups supersede the effect of prior mixed-sex peer groups, I ran models with these variables lagged at *t*-1 (to coincide with prior reports of mixed-sex peer groups). The effects of mixed-sex peer groups on property crime were unchanged, supporting the assertion that individual histories of peer group sex composition are more important than current peer group sex composition.

Table 3. Random Effects Negative Binomial Models: Offending Counts

	Model I		*Model II*	
	Property Crime	Violent Crime	Property Crime	Violent Crime
Observations	5,058	5,058	5,058	5,058
Individual Respondents	1,430	1,430	1,430	1,430
Intercept	-1.01***	-2.92***	-2.82***	-5.08***
	(0.25)	(0.32)	(0.28)	(0.35)
Focal Variables				
MSPG	-0.003	0.26***	-0.05	0.16*
	(0.06)	(0.07)	(0.06)	(0.07)
$MSPG_{(t-1)}$	-0.12*	0.05	-0.19***	-0.07
	(0.06)	(0.07)	(0.05)	(0.06)
Peer Group Characteristics				
New Peer Group	0.21***	0.06	0.17**	0.07
	(0.05)	(0.07)	(0.05)	(0.06)
$Peer\ Group\ Size_{(t-1)}$	0.11***	0.24***	0.07**	0.16***
	(0.02)	(0.03)	(0.02)	(0.03)
$Peer\ Attachment_{(t-1)}$	0.04	0.11*	0.09*	0.18***
	(0.04)	(0.05)	(0.03)	(0.04)
Sexual and Romantic Activity				
$Sexual\ Debut_{(t-1)}$	-	-	-0.03	0.23**
			(0.06)	(0.08)
$Romantically\ Active_{(t-1)}$	-	-	0.13*	0.19**
			(0.05)	(0.07)
Exposure to Delinquency				
$Any\ Violent\ Delinquency_{(t-1)}$	-	-	0.05	0.50***
			(0.06)	(0.07)
$Any\ Property\ Crime_{(t-1)}$	-	-	1.41***	0.23***
			(0.06)	(0.06)
$Peers'\ Violent\ Delinquency_{(t-1)}$	-	-	0.09***	0.35***
			(0.02)	(0.03)
$Peers'\ Property\ Crime_{(t-1)}$	-	-	0.27***	0.25***
			(0.02)	(0.03)
Background and Contextual Variables				
Age	-0.04***	0.03*	-0.06***	-0.001
	(0.01)	(0.02)	(0.01)	(0.02)
Female	-0.31***	-0.61***	-0.08	-0.27***
	(0.06)	(0.08)	(0.06)	(0.07)
Black	-0.04	0.44***	-0.09	0.19*
	(0.06)	(0.09)	(0.06)	(0.08)
Other Race/Ethnicity	0.03	0.11	-0.01	0.07
	(0.10)	(0.14)	(0.09)	(0.12)
White	-0.25*	-0.14	-0.06	0.02
	(0.12)	(0.17)	(0.11)	(0.15)
Income in 10,000s	-0.04	-0.06*	-0.004	0.002
	(0.02)	(0.03)	(0.02)	(0.02)
Fit Statistics				
Log-likelihood	-7067.505	-5264.281	-6525.051	-4953.082
BIC	14254.41	10647.96	13220.68	10076.74

*p≤0.05; **p≤0.01; ***p≤0.001

Standard errors in parentheses.

"Hispanic" excluded from analyses as racial/ethnic reference category.

Coefficients converted to percentages in text using the formula $(exp(\beta)-1)\times 100$.

Contemporaneous reports of mixed-sex peer groups are positively associated with violent delinquency. In Model I, adolescents in mixed-sex peer groups engage in 30% more violent delinquency than do adolescents in same-sex peer groups, while in Model II this effect reduces to 17%. As with property crime, several other peer group characteristic variables are positively associated with violent delinquency.

Romantic activity is associated with a 14% increase in property crime and a 17% increase in violent delinquency, while sexual debut is associated with a 26% increase in violent delinquency. Given romantic activity is associated with both future reports of mixed-sex peer groups and increases in delinquency, results are interpreted to mean romantic activity mediates the effect of mixed-sex peer groups on delinquency. Self-reports of delinquency and peers' delinquency are positively associated with property crime and violent delinquency. Prior histories of property crime predict a 310% increase in property crime and a 26% increase in violent delinquency, while prior histories of violent delinquency increase current violent delinquency by 65%. A one unit increase in the proportion of peers who engage in violent delinquency is associated with 9% and 42% increases in property crime and violent delinquency, respectively. Similarly, a one-unit increase in peers' property crime is associated with 31% and 28% increases in property crime and violent delinquency.

Overall, findings related to background and contextual variables align with previous research on age, race, ethnicity, sex, and income. Younger, girl, White, and lower-income adolescents engage in less property crime than do older, boy, Hispanic, and higher-income adolescents. Notably, the overall effect of being female on offending reduces substantially from Model I to II, and is not associated with property crime in Model II. It is possible romantic and sexual activity

and exposure to delinquency mediate the effects of both mixed-sex peer groups and sex on delinquency, and future research is needed to better understand this finding.

Discussion and Conclusions

Results suggest mixed-sex peer groups are associated with delinquency and that *mixed-sex peer groups are a significant predictor of delinquency net of their shared correlates*. Mixed-sex peer groups are associated with increases in property and violent crimes committed by adolescents. The significance of these associations remains after controlling for correlates of mixed-sex peer groups such as exposure to delinquency and romantic and sexual activity. It therefore appears mixed-sex peer groups exert an indirect effect on delinquent outcomes (vis-à-vis their association with exposure to delinquency and sexual and romantic activity), in addition to a direct effect. This research supports a causal sequence in which delinquency and delinquent peers predict membership in a mixed-sex peer group, and, subsequently, mixed-sex peer groups are associated with delinquency. Results complicate conventional explanations regarding how closely tied adolescent delinquency is to peers' delinquency (Haynie and Osgood 2005; Hirschi 1969) and literature regarding sexual and romantic activity may explain these results.

Regarding violent delinquency: if adolescents in heterosexual relationships cultivate mixed-sex peer groups to maximize time spent with partners as found by Kreager & Haynie (2011), and supported by this paper's finding that romantically active adolescents are more likely to have mixed-sex peer groups) it follows that the desire to spend time with partners and remain in the good graces of a partner's friends may increase adolescents' willingness to accept and participate in previously undesirable behaviors. Support for this explanation is buoyed by the finding that adolescents with mixed-sex peer groups are more likely to report violently delinquent peers, but less likely to have engaged in violent delinquency themselves in years prior, indicating

something specific to mixed-sex peer groups makes adolescents more tolerant of peers' "bad behavior." This, paired with the finding that mixed-sex peer groups are associated with contemporaneous, but not future increases in violent delinquency, could mean mixed-sex peer groups immediately increase opportunities to engage in violent delinquency by disincentivizing severing ties with violent peers. Adolescents' desire to seek interactional opportunities and approval with romantic partners and among partners' friends could explain this dynamic.

Findings regarding property crime likewise suggest there is more to adolescent peer grouping than "birds of a feather flocking together." Unlike violent delinquency, prior reports of mixed-sex peer groups decrease the amount of property crime reported among sampled adolescents. Given exposure to property crime does not predict mixed-sex peer groups, it is possible property crime proclivities have little to do with peer group entry, but instead influence whether or not adolescents remain in mixed-sex peer groups. The transition from same-sex peer groups in childhood to mixed-sex peer groups in adolescence is not absolute, and many respondents weave in and out of same- and mixed-sex peer groups throughout adolescence. Adolescents who cross gendered boundaries often find themselves subject to a very particular type of scrutiny among newfound peers (Maccoby 1990, 1998; Mehta and Strough 2009; Thorne 1993), and adolescents prone to property crime may alter or hide these behaviors in ways that adolescents prone to violence do not in an attempt to gain entry into mixed-sex contexts—hence the non-association between prior exposure to property crime and mixed-sex peer groups. Once in a mixed-sex peer group, however, adolescents prone to such behaviors may be exposed to undesirable reactions from other-sex peers. For example, playfully stealing a girl's handbag in a mixed-sex setting may produce an intensely negative reaction from peers because the contents of said handbags could embarrass the 'victim' and make male peers feel uncomfortable (girls keep menstrual and

grooming products in their handbags). Assuming mixed-sex peer groups are desirable, and such censures are consistent, we might expect these dynamics will gradually deter property crime. Further, and regarding more serious property crimes, girls are generally more risk-averse than are boys (Grasmick et al. 1996) and may be less willing to tag along for risky activities. Among boys motivated to maintain mixed-sex peer groups because they allow for more time with potential and/or realized intimate partners, such behaviors could gradually lose their luster. Given boys engage in a larger share of serious offending than do girls (Chesney-Lind and Pasko 2013), it is possible the deterrent effect of mixed-sex peer groups on property crime is especially pronounced among boys. While such differences were not apparent in this sample (z-tests for the equality of regression coefficients in gender-split models indicate no significant differences in the effects of mixed-sex peer groups on delinquency, while *gender×mixed-sex peer group* interaction terms were non-significant), future research may yet reveal substantial, gender-specific effects.

By deliberately avoiding conflation of the effects of other-sex friendship and heterosexual relationships on delinquency, this research demonstrates the importance of separately analyzing platonic and intimate interactions and group dynamics among adolescents. Further, in controlling for exposure to delinquency, I demonstrate the importance of complicating assortative explanations of delinquent peer networks and interactions. Where criminological work has focused primarily on the influence of delinquent peers and intimate partners in research on other-sex peers and delinquency, gender studies broadly contextualize how the onset of mixed-sex peer grouping influences adolescents' behavioral development. Taken together, such theories indicate mixed-sex peer groups are uniquely influential on adolescent delinquency. This study supports existing expectations that delinquent peers, romantic activity, and sexual activity are associated

with higher probabilities of being in a mixed-sex peer group (Armour and Haynie 2007; Warr 2002), as well as the argument that mixed-sex peer groups are uniquely influential on individual behavior (Monsour 2002). Specifically, results suggest mixed-sex peer groups present immediate opportunities for violent delinquency, but deter property crime in the long-term.

CHAPTER 2:

The Enduring Influence of Adolescent Heterosociality on Substance Use

What the sex composition of adolescent peer groups can tell us about adolescents' drinking and young adults' drug use

Abstract

Gender scholars have argued the transition from same-sex peer groups in childhood to mixed-sex peer groups in adolescence is a normative and formative turning point in the life course. At the same time, criminologists have linked the sex composition of adolescent peer groups to drinking and drug use. Little research, however, has combined insight from both disciplines to contextualize the short- and long-term influence of adolescent homo- and heterosociality on substance use. This manuscript uses group trajectory modeling to identify two distinct patterns of sex-based peer group sorting among a sample of high-risk adolescents, and finds these trajectories are associated with adolescents' underage drinking and young adults' drug use. Specifically, I find heterosociality in adolescence is positively associated with increases in underage drinking, but not drug use, net of other factors. I also find heterosocial histories substantially increase the odds of reporting drug use in young adulthood among adults with few drug-using peers. Conversely, formerly heterosocial young adults embedded in social networks where drug use is common are less likely to report drug use than are similarly situated formerly homosocial counterparts. I use differential social organization theory to argue same- and mixed-sex peer groups are organized in favor of distinctly different behaviors, and that this group organization ultimately begets differences in substance use behaviors across the life course.

Introduction

Adolescent peer group dynamics are an important predictor of offending and substance use trajectories across the life course, and the influence of peer group dynamics on behavioral development, crime, and substance use are well-documented (Kreager and Haynie 2011; Thornberry and Krohn 1997). Both the delinquent proclivities of individual peers (Piquero et al. 2005; Widdowson et al. 2020), and the structural characteristics of peer groups (Dunphy 1963; Kreager, Rulison, and Moody 2011) are associated with offending and substance use. That delinquent and criminal peers are criminogenic is one of the most universal effects found in criminological literature (Warr 2002, 2005), second perhaps only to the sustained and persistent influence of sex and gender (Mears, Ploeger, and Warr 1998; Rennison 2009). Gender is at once an individual identity and an organizing principle of peer groups (Burton Smith, Davidson, and Ball 2001; McPherson, Smith-Lovin, and Cook 2001; Thorne 1993). Gender differences in how and how much delinquent peers encourage delinquent behavior are apparent at individual and structural levels, in that peer influences are filtered through both commitments to gender normative behavior and group-level gender ideologies (Piquero et al. 2005; Rios 2009). Both boys and girls are susceptible to the criminogenic influence of delinquent peers, but this susceptibility may be contingent on the sex and gender dynamics in which these relationships are embedded. For example, girls are thought to be particularly vulnerable to boy peers' delinquent influence (Caspi et al. 1993; Haynie 2003), and though boys are more likely to commit crimes in same-sex peer groups, they are also more likely to report membership in mixed-sex peer networks than are their non-delinquent peers (Warr 2002). Such findings suggest the sex composition of adolescent peer groups may temper the influence of delinquent peers, in addition to exerting its own, independent effects on delinquency and crime.

Where childhood peer groups are organized in favor of perpetuating same-sex cultures of play and socialization (Maccoby 1998; Thorne 1993), adolescent peer groups are generally embedded in mixed-sex contexts and vary considerably in terms of members' characteristics, structure, and cultural expectations (Flynn, Felmlee, and Conger 2017; McGuffey and Rich 1999). Subsequently, differences in adolescent peer group membership and organization are associated with differences in delinquency, substance use, and crime (Matsueda, O'Neill, and Kreager 2020; Warr 2002, 2005). The sex composition of peer groups, in particular, has been associated with a wide range of delinquent behaviors, including violence, gang affiliation, and theft (Arndorfer and Stormshak 2008; Cohen 1955), and mixed-sex peer groups may be particularly influential with regards to underage drinking and drug use (Kreager et al. 2011; Warr 2002). Kreager and Haynie (2011), for example, find the drinking habits of adolescents' other-sex romantic partners and (usually other-sex) friends of partners are more strongly associated with adolescent drinking than are the adolescents own (usually same-sex) friends. This finding suggests research that finds criminogenic links between heterosexual romantic and sexual activity and substance use (i.e. McCarthy and Casey 2008) may actually be picking up on the influence of other-sex peers and mixed-sex peer groups. Such assertions are further buoyed by studies such as Mrug, Borch, and Cillessen's work regarding substance use in high school. They find adolescent girls' smoking and boys' drinking are positively associated with having other-sex friends, net of friends' delinquent and sexual histories (2011). These studies are somewhat limited, however, by the fact that they do not consider how overall changes in the sex composition of peer groups across adolescence are implicated in drinking and drug use behaviors across the life course. The major goals of this work, then, are to describe changes to the sex composition of peer groups across adolescence; examine associations between sex-based peer

group sorting patterns and adolescent substance use; and determine whether the sex-composition of peer groups in adolescence continues to influence drug use in young adulthood.

I use the Denver Youth Survey (DYS) to track peer characteristics and substance use proclivities of individuals in high-risk circumstances from early adolescence through young adulthood. This longitudinal data allows me to identify two sex-based peer group sorting trajectories among adolescents. Upon identifying variation in same- and mixed-sex peer group formation, I build on criminological research that has found mixed-sex peer groups are associated with delinquency (Kreager et al. 2011; Warr 2002), and ask whether heterosocial adolescents are more likely to self-report underage drinking and drug use than are homosocial adolescents. Findings support prior assertions that heterosocial adolescents are more likely to drink underage than their homosocial counterparts (Kreager and Haynie 2011; Kreager et al. 2011; Sanchagrin, Heimer, and Paik 2017). I then explore the enduring influence of peer group sex composition by asking whether heterosocial histories are associated with drug use in young adulthood. I find heterosocial histories are an important predictor of adult drug use. I explain these findings using differential social organization and interactionist frameworks. I argue differences in the range of acceptable behaviors in same- versus mixed-sex peer groups lead to differences in substance use, and that individuals who spend the majority of their time in one context or another are more likely to learn and reproduce behaviors within social boundaries drawn by the group, as suggested by differential organization and association theories (Matsueda 2006; Short 1957; Sutherland et al. 1992). I use the concept of *differential social organization* to articulate how these bounds are established and what this means for adolescent and substance use. In explaining adult drug use, I integrate this concept with interactionist arguments regarding

cognitive transformations and turning points in the life course (Bengston, Elder, and Putney 2011; Giordano, Cernkovich, and Rudolph 2002; Sampson and Laub 1995).

Differential Social Organization and the Dynamism of Mixed-Sex Peer Groups

Differential social organization theorizes group crime rates are determined by the extent to which groups are organized in favor of or against crime, and that crime is therefore "rooted in the social organization and is an expression of that social organization" (Sutherland et al. 1992:90). Differential social organization is, in turn, linked to Sutherland's individual-level theory of differential association, in that groups strongly organized in favor of crime are considerably more likely to transmit definitions favorable to crime to their members, and members are subsequently more likely to engage in group-endorsed crimes (Matsueda 2006). A straightforward example of this is street gangs. Street gangs are organized in favor of crime in that they allocate power and prestige to members who are willing to tolerate and engage in criminal activity (Decker and Van Winkle 1996; Leverso and O'Neill 2021). Individual gang members therefore associate criminal activity with desirable outcomes, and are motivated to initiate and continue their engagement in crime. Notably, peer groups do not have to be explicitly organized around criminal activity to transmit it amongst their members, they can also be weakly organized against crime or organized around principles that normalize antisocial behavior. For instance, Kreager's (2007) study on boys' sport and violent behavior finds sports organized around full-body contact may encourage violent offending in the form of fighting. This, along with Kreager's assertion that his findings are congruent with social learning theory demonstrates how non-criminal social groups can encourage and propagate criminal behavior.

In addition to highlighting how intergroup dynamics transmit definitions favorable to crime, differential social organization theory suggests adolescent social groups are embedded in a

"wider network of social relations", and that these networks are reciprocally associated with adolescents' peer group structure (Matsueda et al. 2020:246). Thus, it important to keep in mind the wider worlds within which the consequences of these groups are made real and enduring. Adolescents' institutional contexts can facilitate sex-segregation by academic subject or extracurricular activity to differing degrees (Carroll 2002; Faris and Felmlee 2011), which in turn has implications for both how likely adolescents are to gravitate toward mixed-sex peer groups and the goals around which these peer groups are organized. Peer group sex composition, then, may hint at the dominant goals of adolescent peer groups by signaling whether they are primarily organized in favor of platonic- or sexual interaction, or structured or unstructured activities.

Sutherland suggests four modalities through which peers and peer groups can transmit definitions favorable to crime: priority, frequency, duration, and intensity (Matsueda 2006; Sutherland et al. 1992). His underlying logic is simple: people prioritize familiar logics, repetition is the key to learning, and people are more willing to learn from people they are close to. The dynamics associated with these modalities are clearly evident in adolescence and in adolescent peer groups. Adolescence is characterized by a desire to push the bounds of individual agency, and adolescents seek spaces and peer groups that allow them to exercise autonomy over their personal lives while providing some guidance over broader issues of morality and convention (Crouter et al. 2004; Daddis 2011). Definitions of crime learned in adolescence, and especially those frequently transmitted in close-knit peer groups, are likely to be prioritized throughout the life course absent catalysts for change. While Sutherland's rule of prioritization implies definitions of crime learned in childhood will initially be prioritized above those learned in adolescence, contrary adolescent definitions can supersede childhood definitions where adolescent definitions are frequently communicated over an extended period of time.

Further, many of the contexts adolescent peer groups and interactions are embedded in – including mixed-sex and delinquent contexts – may not have a childhood equivalent from which adolescents can draw behavioral guidance. Thus, many behavioral definitions associated with adolescent-era firsts maintain high priority in decision-making scenarios throughout the life course. Both individual- and structural factors push adolescents to privilege interpersonal relationships with peers, and peer groups' guidance regarding desirable behavior. Adolescents often prefer spending time with friends over family members (Crouter et al. 2004), and school and extracurricular contexts facilitate time with peers more so than in childhood (Barnes et al. 2007). Therefore, adolescents are frequently exposed to their peers' definitions of delinquency across multiple contexts. Further, the intensity – i.e. the sense of closeness and importance – ascribed to adolescent relationships and the cultural norms they impart is heightened in adolescence due to a confluence of social and biological factors (Hill and Lynch 1983; Kohlberg and Gilligan 1971). Thus, definitions imparted within these peer groups and by individual peers may be prioritized over definitions imparted by other groups and institutions with whom adolescents interact. Finally, adolescents are more likely to maintain continuity of group membership in high-priority groups, in which case the frequency of exposure to group norms regarding crime is high, and the intensity of peer-to-peer relationships can flourish. The convergence of these factors – early-in-the-life-course prioritization of peers; frequent peer interaction; perceived intensity of interpersonal bonds, and duration of peer group membership – help explain why criminal activity peaks in adolescence (Steffensmeier et al. 1989), and these factors are linked to both the sex composition of peer groups and peers' delinquency.

In addition to shifting away from family and towards friends in decisions regarding how and where to spend time (Lam, McHale, and Crouter 2014), adolescents prioritize certain friends and

friend groups above others. Romantic and sexual relationships are generally ranked high in terms of their importance and intensity (Flynn et al. 2017; Giordano et al. 2006), and mixed-sex peer groups are often organized around their initiation and maintenance (Mrug et al. 2011; Thorne 1993). Romantic and sexual activity is, for the most part, new to adolescents in that childhood peer groups are not organized around the more intimate aspects of heterosexual socialization. Therefore, many of the definitions regarding behaviors associated with romantic and sexual intimacy are being encountered for the first time, in which case they are more likely to be prioritized throughout the life course. Further, mixed-sex peer groups may be highly prized within adolescent networks of socialization because they facilitate romantic and sexual activity, and the definitions of crime imparted by in-group members may supersede competing definitions passed on in other social spaces. Spending a lot of time in a particular group necessarily correlates with exposure to the group's definitions and organizational structure. Given mixed-sex peer groups are consistently associated with delinquency (Arndorfer and Stormshak 2008; Kreager et al. 2011), it makes sense that adolescents who spend more time in mixed-sex peer groups may also be spending more time with delinquent peers. Thus, adolescents in mixed-sex peer groups may be more frequently exposed to definitions favorable to crime early in the life course, and will prioritize these definitions over counterfactuals due to their familiarity and intense commitments to their peer groups. In addition, some pressures exerted by mixed-sex peer groups separate from their delinquent members are also associated with delinquency, particularly pseudomature behaviors like underage drinking and sexual activity, which can be used to bolster popularity and status with both in- and out-group members (Allen et al. 2014; Gordon Simons et al. 2018; Rebellon 2006). Finally, priority, frequency, duration, and intensity are all tethered to patterns of continuity and change with regards to peers, peer groups, and the social structure

(Bengston et al. 2011). The duration of one's tenure in a particular peer group or social context influences and is influenced by that peer group's ranking relative to other social contexts, the frequency with which peer group members are exposed to competing definitions of favorable behavior, and the perceived closeness one feels with their peers. In this way, differential social organization is a dynamic process, and the goals around which peer groups are organized change throughout the life course and are sensitive to large-scale social changes that undermine or strengthen institutional organization against crime (Matsueda 2006; Sutherland 1973).

The organization of peer groups changes throughout the life course, and especially in early and late adolescence. Where childhood peer groups are organized in favor of perpetuating same-sex cultures of play and socialization (Maccoby 1998; Thorne 1993), adolescent peer groups are generally embedded in mixed-sex contexts and vary considerably in terms of members' characteristics, structure, and cultural expectations (Flynn et al. 2017; McGuffey and Rich 1999). Importantly, adolescence marks a pronounced shift in social expectations regarding adolescents' autonomy and maturity relative to younger children and peers, parents, and institutional actors (such as teachers) project these expectations onto adolescents to differing degrees. Mixed-sex peer groups are thought to serve an important function during this period of expectation-upheaval, in that they can challenge and/or reinforce norms learned the same-sex cultures of childhood by providing opportunities to engage in behaviors previously constrained in same-sex peer groups (Kuttler et al. 1999; Mehta and Strough 2009). How and how well these groups execute this function with regards to transmitting definitions favorable to delinquency is dependent on the network of social relations in which they are embedded. Strong relationships with parents and strong parental controls, for example, can constrain the influence of delinquent peers (Bahr, Hoffmann, and Yang 2005; Matsueda 1992; Wells and Rankin 1988), even if they

do not eliminate it entirely. Peer-to-peer relationships outside of dominant peer groups, and intergroup characteristics associated with low levels of closeness and bonding can also offset pressures exerted by the group's social organization. Larger peer groups, for example, are associated with value heterogeneity among members, lower levels of "closeness" with peers, and higher rates of delinquency among members (Kreager et al. 2011; Lantz 2018). Groups organized in favor of particular types of delinquency, like violence and gang activity, may find it difficult to maintain membership because violence erodes social bonds and encourages peer group churning (Decker and Van Winkle 1996; Goldstein and Higgins-D'Alessandro 2001; Schreck, Fisher, and Miller 2004). Sexual and romantic activity is a powerful sorting mechanism in adolescent peer groups, and intimate relationships with in- and outgroup members exert considerable sway over the organization of peer groups and their rates of delinquency (McCarthy and Casey 2008; Thorne 1993).

Differential social organization theory acknowledges how the duration of exposure to these factors influences the transmission of delinquent definitions, and emphasizes the importance of centering drivers of social changes in research on how and why group organization begets delinquent and criminal activity. The meaning of mixed-sex peer groups and interactions change substantially during the transitions from childhood to adolescence, and adolescence to young adulthood. I argue that these changes have implications for offending in general, and substance use in particular, throughout the life course.

Heterosociality and Substance Use

When considering how adolescent peer groups organize around substance use, specifically, it is important to keep in mind underage drinking and drug use differ from other types of delinquency in important ways. These behaviors tend to signal maturity and status among peers

where other types of delinquency – like property crime or violence – do not (Allen et al. 2014; Gordon Simons et al. 2018). In addition, it is possible to become physically dependent on alcohol and drugs, in which case the benefits to denying self-medication through substance use may be outweighed by the physiological and psychic costs of avoiding intoxicating substances. Therefore, interactional mechanisms associated with initiation and desistance from substance use necessarily differ from those associated with non-substance-related offending, and substance use, abuse, and addiction can themselves precede a host of criminal behaviors (Anglin and Speckart 1986; Martinelli et al. 2020). These realities have implications for how or why adolescent groups impart definitions favorable to underage drinking and drug use, and why their influence lingers in adulthood.

Research on peers and substance use in general certainly suggests different groups have different norms around adolescent drinking and drug use. For example, peer groups organized around extracurricular activities that require institutional contact, such as youth clubs, are more likely to expose adolescents to unfavorable definitions of drinking and drug use (Thorlindsson and Bernburg 2006). Conversely, adolescents whose peer groups are "adrift" from parental and/or educational influences may be more likely to engage in mixed-sex "party delinquency," i.e. drinking, drug use, and sexual activity (Hagan 1991). Among adolescents with lots of drug-using peers, peer effects extend past simple mimicry of single individuals, and are linked to a group culture and consensus regarding the acceptability of delinquent behaviors (Widdowson et al. 2020). The results of these studies all suggest adolescent predispositions toward substance use flows from the norms and behaviors around which their peer groups are structured, in line with the central tenants of differential social organization theory.

The question of whether or not deviant adolescent behaviors persist in young adulthood, and to what extent, is foundational to criminological literature, and when it comes to crime these stages of the life course are inextricably linked. The transition from adolescence to young adulthood is characterized by both change and continuity (Elder, Johnson, and Crosnoe 2003). In terms of learning and unlearning of behaviors, young adults' moral determinations are more contextually driven and less egoistic than are adolescents' (Kohlberg and Hersh 1977), though organizing principles of the adolescent peer groups of their pasts continue to motivate adult behaviors. However, perceptual shifts in meanings ascribed to prior behaviors can promote behavioral change (see: Giordano et al. 2002). In particular, behaviors that made some adolescents popular among other-sex peers may no longer serve them as adults, especially those related to substance use (Moffitt 1993). For example, pseudomature behaviors such as underage drinking and risky sexual activity have been found to bolster adolescent popularity (Gordon Simons et al. 2018), and are associated with mixed-sex peer networks (Weerman and Bijleveld 2007). While these reasonably common forms of adolescent deviance can help adolescents achieve goals related to popularity and heterosexual pairing, such as the maintenance of mixed-sex peer groups, their perceived positive effects (and the positive definitions associated with them) may fade in adulthood. Although there is evidence popular-among-their-peers adolescents reap some rewards later in the life course (Conti et al. 2013), those who achieve that popularity through pseudomature behavior are more prone to substance use and long-term difficulties in forming strong and supportive relationships as adults (Allen et al. 2014). Where some young adults will view these adverse outcomes as a push to change, those who spent a substantial portion of their adolescence in peer groups that rewarded these now-problematized behaviors may be more hesitant or less capable of disrupting their antisocial behavioral patterns.

Change-averse young adults may find social difficulties compounded by shifts in the organizing principles of their peer groups. Most adult peer groups are organized in favor of different goals and norms than are adolescent peer groups, and adults' educational, occupational, and familial commitments are generally thought to be incompatible with criminal behavior (Cernkovich and Giordano 2001; Massoglia and Uggen 2010). As with mixed-sex peer groups, there is certainly variation in the extent to which individuals are committed to these goals. Therefore, the effects of the sex composition of peer groups may not be similarly criminogenic across the life course. For example, while remaining in same-sex peer groups may deter pseudomature behavior and delinquency formerly homosocial adults may find it more difficult to form functional relationships with other-sex peers, which in turn could delay milestones related to desistance such as marriage or labor market entry. In these ways, while young adulthood is marked by a shift in personal goals and capacity for moral reasoning, prior experiences and learned behaviors from adolescence inevitably form the basis for young adults' goal-adherence and context-driven reasoning. Thus, we can reasonably expect variation in young adults' behavioral patterns will be predicted by the characteristics of the social spaces where these behaviors were previously and reinforced (Bengston et al. 2011; Elder et al. 2003).

Even where criminological research acknowledges the differential influence of other-sex peers and mixed-sex peer groups on adolescent delinquency (Kreager and Haynie 2011; Warr 2002), few have considered the continued influence of these groups on adult offending. I address this gap in literature by applying the concept of differential social organization to theorize about how or why same- and mixed-sex peer groups are organized in favor of crime in adolescence and young adulthood. I identify predominantly homosocial and heterosocial adolescents using group

trajectory modeling, and trace the offending patterns of these individuals across adolescence and into young adulthood.

Linking the Sex Composition of Adolescent Peer Groups to Substance Use

Substantial changes to the composition of peer groups in regards to sex, gender expectations, and behavioral proclivities can act as a catalyst for behavioral change by "opening the door" to some opportunities and closing it to others (Giordano et al. 2002:1000). While opportunities for heterosexual romance are among the most obvious catalysts for behavioral change in mixed-sex peer groups, these groups can also expose previously homosocial young people to new interests and activities (including substance use), and provide a unique space to continue developing gender identities (McGuffey and Rich 1999; Monsour 2002; Thorne 1993). Phrased another way, changes in peer group composition often mean changes in the behavioral definitions adolescents are exposed to, and the goals and behaviors around which these groups are organized. Given prior findings that mixed-sex peer groups are positively associated with adolescents' delinquency and substance use (Arndorfer and Stormshak 2008; Kreager and Haynie 2011; Warr 2002), I hypothesize that heterosocial adolescents will be more likely to engage in underage drinking and drug use than their homosocial counterparts:

H_1: Adolescents in the predominantly heterosocial group are more likely to self-report underage drinking and drug use than adolescents in the predominantly homosocial group

The majority of social milestones for adolescents revolve around peer group formation and interaction with peers. Teens and pre-teens are deeply concerned with how others view their social and physical selves, particularly as they pertain to gender role adherence and performance (Hill and Lynch 1983). How these concerns manifest into behavioral change in both the short- and long-term are likely contingent on when in adolescence young people are exposed to

opportunities for and established behaviors, and for how long. In early adolescence – around ages 11 to 14 – young people begin to exhibit preference for peers over family members; are more curious about the "opposite" sex; and are invested in perpetuating desirable behaviors as rigidly defined by their social network (CDC 2021; Kohlberg and Hersh 1977; Maccoby 1998). Given evidence adolescents may be uniquely susceptible to the influence of other-sex peers when it comes to delinquency (Caspi et al. 1993; Kreager and Haynie 2011), I test H_1 in two parts, with- and without an interaction term to control for whether their heterosocial peer group includes peers who drink and use drugs.

In mid- to late adolescence – around ages 14 to 17 – young people spend considerable time with peers in both structured and unstructured settings; tend to enter into romantic and sexual relationships; and develop more individualistic views of desirable behavior (CDC 2019; Giordano et al. 2006; Kohlberg and Gilligan 1971). As the primary goals of adolescents' interactions change, so too will the organization of their peer groups. Among adolescents who leverage their membership in mixed-sex peer groups to find a romantic or sexual partner, mixed-sex peer groups may no longer be desirable as the primary goal of group membership has been achieved and maintaining other-sex friendships can strain romantic relationships (Gilchrist-Petty and Bennett 2019). While this does not necessarily mean adolescents will abandon their mixed-sex peer groups, they may start to prioritize other groups in their wider network of social relations above their mixed-sex peer groups, and mixed-sex peer groups may reorganize to become less threatening to older adolescents emerging goals and desires. I therefore anticipate that as people transition from adolescence to young adulthood, the effect of the sex composition of peer groups in adolescence on substance use will weaken. However, per differential social organization theory, adolescent definitions of substances use will be prioritized until they have

been frequently and/or continuously rebuked. Therefore, I hypothesize adolescent histories of mixed-sex peer groups will be associated with young adults' drug use, though the sum total of their influence is likely to change.

H_2: Heterosocial histories are positively associated with drug use in young adulthood

As with H_1, I include an interaction term to assess the potentially unique influence of other-sex, delinquent peers. These analyses are designed to examine whether or not adults' heterosocial histories influence their current vulnerability to the influence of drug-using peers.

Taken together, these hypotheses pave the way to a more comprehensive understanding of how and why the sex composition of adolescent peer groups influence substance use across the life course. Affirmative findings for H_1 would generally support prior research that finds mixed-sex peer groups are associated with increases in delinquency in general and underage drinking in particular (Kreager and Haynie 2011; Warr 2002). Furthermore, affirmative findings regarding H_2 would illustrate the importance of extending current and prior theorizing on the power of mixed-sex peer groups beyond delinquency by positioning these adolescent experiences as a precursor to adult substance use.

Data and Methods

The Denver Youth Survey

The Denver Youth Survey (DYS) is a ten-wave longitudinal study of delinquency in high-risk Denver, Colorado neighborhoods. This survey, initiated in 1988, follows 1,525 people from childhood through young adulthood. Respondents ranged in age from 7 to 16 in Wave 1 and ages 17 to 28 in Wave 10. Interviewer-conducted surveys were administered annually in Waves 1-5 and 6-10, with a two-year break between waves 5 and 6. Respondents were given a child (ages 7-10), youth (ages 11-18), or adult (ages 18+) survey based on age and time since most recent

interview (for more on sampling methodologies, see Huizinga, 2017). While some data from the child surveys was used to validate group trajectory model outputs the models presented in this paper exclusively use data from youth and adult survey respondents. Data for models testing H_1 include 4,851 observations from 1,418 adolescents aged 11 to 18 at the time of survey administration. Each respondent could supply a maximum of six waves of data, and the average respondent is represented across three waves[1]. The data for testing H_2 include 2,525 observations from 906 young adults aged 19 to 26 at the time of survey administration. Each respondent could supply a maximum of seven waves of data, and the average respondent is represented across three waves. Adolescent and adult samples are not mutually exclusive: 887 of 1,438 respondents represented in these analyses are present in all models; 532 respondents are only present in models testing H_1; and 19 respondents are only present in models testing H_2. While t-tests reveal some statistically significant differences in the means of variables used in analyses between the 532 respondents who were only included in H_1 tests and the 887 respondents included in both H_1 and H_2 tests, the majority of these differences are functionally negligible. It is worth noting, however, that adolescent respondents who were not included in adult analyses were considerably less likely to report drug use in adolescence (non-missing μ=0.27; missing μ=0.18). Thus, adolescents with histories of drug use are overrepresented in H_2 analyses, and estimates of any protective effect of heterosocial and homosocial histories are likely conservative. Also of note regarding missing and excluded observations, respondents who did not report belonging to a peer group, or who reported having "no friends" throughout adolescence are not included in analyses. So-called "loners" have been found to have distinctly different offending patterns and

[1] The DYS is divided into five age-graded cohorts. In Wave I, Cohort I is aged seven to eight, and Cohort V is aged fifteen to sixteen.

motivations than less socially isolated individuals (Demuth 2004), and analyses do not capture the experiences of loner youths

Mixed-Sex Peer Group Operationalization and Trajectory Groups

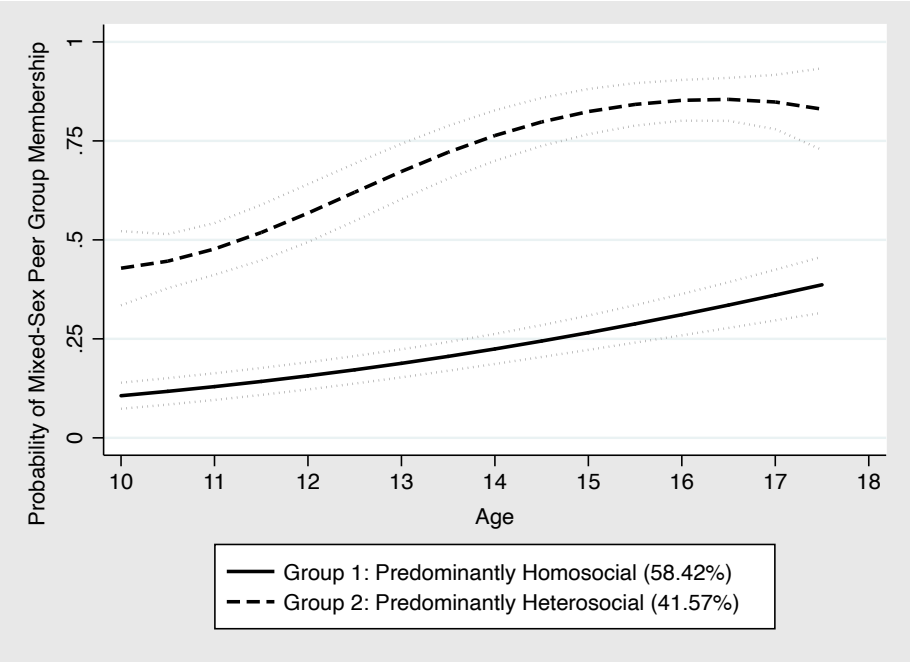
Differential social organization theory suggests the overall change in gender composition of peer groups throughout adolescence will contribute to an accumulation of definitions favorable to substance use. Thus, it is necessary to capture peer group membership across time, and to account for peer group membership histories. I therefore I use group trajectory models to identify patterns of sex-based peer groups sorting. While the method is not without its detractors (see: Erosheva et al., 2014; Sampson & Laub, 2005), it provides "a convenient statistical approximation" (Nagin & Tremblay, 2005, p. 882) of the peer group sorting patterns of interest in this study. DYS child and youth respondents were asked a series of questions regarding the characteristics of the peer group they spent the most time with in the past year. The variable *mixed-sex peer group* was generated using responses to the question, "Are there boys and girls in your peer group?" with the options of "boys only", "girls only", or "both boys and girls". This variable, along with respondent sex, was used to generate a dichotomous measure of whether or not the respondent reported membership in a mixed-sex peer group in a given wave. Missing values were carried forward from prior waves if, and only if, respondents reported they had not changed to a new peer group since the last survey period. I used this and other measures to execute a series group-based trajectory models to identify latent clusters of respondents who – in adolescence – follow similar sex-based peer group sorting patterns (see: Nagin, 2014; Nagin et al., 2018). This method of categorization—encouraged by Moffitt's (1993) work on offender taxonomies, and popularized following Nagin and Tremblay's (1999) application in their study on boys' physical aggression—is often used to identify distinct behavioral patterns in offending

and predict long-term offending outcomes. Given my bivariate outcome (i.e. whether or not respondents report a mixed-sex peer group in a given wave), I specify a logistic distribution[2] and condition the outcome, mixed-sex peer group, on respondent age to determine the probability each individual respondent will claim membership in one of two trajectory groups. I use data from age ten onward to generate these trajectories because whether or not children enter adolescence as members of mixed-sex peer groups is a meaningful predictor of which sex-based peer group sorting pattern they will follow in adolescence. As per D'Unger, et al. (1998), I use the Bayesian Information Criterion (BIC) (see also: Raftery 1995) to assess model fit and determine the number of groups that best describes the data. Given there are few, if any, existing empirical efforts on sex-based peer group sorting trajectories I rely on fit statistics to determine which models best describe the data. While some research suggests variation in how and when adolescents select into peer groups will be limited (Lipman-Blumen 1976; Maccoby 1998), model outputs indicate two to three distinctly different sorting patterns of peer group sex composition across the life course. The BIC and posterior probabilities of group membership indicate a two-group model best describes the data. The inclusion of quadratic and cubic age coefficients for one (but not both) of these groups improve the model's ability to trace these peer group sorting trajectories across adolescence[3]. Figure 1 shows the shape of two distinct

[2] I use the `traj` package in Stata (Jones and Nagin 2012).

[3] I further tested the robustness of bivariate model results by adding time-varying covariates found to be associated with adolescents' mixed-sex peer groups the first chapter of this dissertation, including romantic and sexual activity and delinquency. While several of these covariates were statistically significant predictors of group membership, model fit decreased with their inclusion and posterior probabilities of group membership were largely unchanged. Therefore, in the interest of parsimony, I use posterior probabilities of group membership as determined by the bivariate model to generate my "patterns of peer group sex composition" variables.

Figure 1. Sex-Based Peer Group Sorting Trajectories



trajectories of sex-based peer group sorting and the proportion of the DYS respondents who belong to each trajectory group:

1. *Predominantly Homosocial Adolescents*: Respondents in this group are more likely than not to begin adolescence in same-sex peer groups and to remain in same-sex peer groups throughout adolescence. Although their probability of reporting a mixed-sex peer group increases with age, it never exceeds 0.40. For these adolescents, the relationship between age and mixed-sex group membership is approximately linear and the duration and frequency of their exposure to mixed-sex peer groups is low.
2. *Predominantly Heterosocial Adolescents*: Although these respondents in this group are more likely than are members of the predominantly homosocial group to begin adolescence in mixed-sex peer groups, they are still more likely than not to begin adolescence in same-sex peer groups. These respondents then go on to maintain mixed-sex peer groups throughout most of adolescence. Their probability of reporting a mixed-sex peer groups increases substantially from ages 11 to 15, and while it decreases slightly in late adolescence these

individuals are far more likely than not to enter young adulthood as members of mixed-sex peer groups. For these adolescents, the relationship between age and mixed-sex group membership is non-linear, and while their probability of mixed-sex group membership increases for most of adolescence, it does begin to decrease in late adolescence (around age 17). The duration and frequency of their exposure to mixed-sex peer groups is high.

Posterior probabilities of group membership discriminate well, and I use them to generate a heterosociality dummy variable where 1 indicates the respondent was (more likely than not) a predominantly *heterosocial adolescent*, and 0 indicates the respondent was (more likely than not) a predominantly *homosocial adolescent*.

Substance Use Outcomes

Self-reports of substance use over the past year were used to generate dichotomous substance use variables: Underage *drinking* (adolescent reports of drinking wine, beer, or liquor), and *drug use* (adolescent and adult reports of illicit substance use, excluding alcohol and tobacco). A value of 1 indicates the respondent has engaged in one of these behaviors in the past year, while a value of 0 indicates the respondent has not engaged in this these behaviors in the past year. Given prior substance use predicts future substance use, I lag these variables at *t*-1 in H_1 analyses. H_2 analyses include a dichotomous measure of whether or not respondents engaged in underage drinking or drug use in adolescence, respectively. I use a bivariate outcome, rather than a count or variety scale of substance use, because my hypotheses focus on the odds or probability of engaging in these behaviors at all, rather than how often respondents engage in these behaviors or how variegated their substance use is. A value of 1 indicates the respondent has engaged in one of these behaviors in the past year, while a value of 0 indicates the respondent has not engaged in this these behaviors in the past year. As respondents are young adults, some

only a year removed from their adolescence, these variables were highly correlated with lagged substance use outcomes (as used in H_1 tests). Therefore, given my theory suggests social histories related to the sex composition of adolescent peer groups should influence adult drug use net of adolescent's delinquent histories, I control for *adolescent drin*king and *adolescent drug use* overall rather than the prior year's drug use.

Peer Group Characteristics

I use responses regarding *peers' drinking* and *peers' drug use* to generate measures of peer substance use. Respondents were asked "how many of your peers have [engaged in behavior]?" Responses range from 0 ("none of them") to 4 ("all of them"). Missing values were imputed using data from prior waves if, and only if, respondents report they have not changed to a new peer group since the last survey period. Analyses presented in tables treat this variable as a continuous measure. However, results of models using a series of dummy variables indicating whether how many peers have engaged in substance use are displayed and discussed in the text, as needed.

The size of adolescents' peer groups is included in models as larger peer groups likely increase the diversity of peers' characteristics, including peers' sex and delinquent behavior. Respondents were asked how many people were in their current peer group. Responses ranged from 1 to 500. These *peer group size* values were then divided into quartiles to account for outlier values, as less than 10% of respondents report peer group sizes of ten or more. A value or 1 indicates a peer group of 1-3 people, 2 indicates 4-5 people, 3 indicates 6-7 people, and 4 indicates eight or more people. Analyses presented treat this variable as a continuous measure. Finally, I control for *attachment to peers* using a measurement of respondents' agreement with the statement, "I feel close to my friends". This variable ranges in value from 1 ("strongly

disagree") to 5 ("strongly agree"). As with *peer group size*, this variable is treated as a continuous measure.

Sexual and Romantic Activity

The DYS allows me to account for romantic activity, sexual activity, and marital status among respondents. Previous literature suggests romantic and sexual activity may be uniquely criminogenic for adolescents (Armour and Haynie 2007; McCarthy and Casey 2008), whereas marriage may be protective against crime for adults (Giordano et al. 2002; Sampson et al. 2006). Given heterosexual pairing is facilitated by mixed-sex peer groups, it is possible any influence of these peer groups is merely vis-à-vis the aforementioned factors. Therefore, I control for romantic activity and sexual debut among my adolescent sample, and marital status among my adult sample. *Romantically active* is a dichotomous variable, where a value of 1 indicates respondents report romantic activity ("got a new boy/girlfriend"; "broke up with a partner"; "went on a date") in their survey wave, and a 0 if they do not report any romantic activity. In addition, later youth and adult survey waves asked respondents to disclose age at first marriage. In total, 32 adolescent respondents reliably report having been married during the data collection period[4]. These respondents are also coded "1" for *romantically active*. Respondents were also asked whether or not they have ever had sexual intercourse with a person of the opposite sex, or sexual relations with a person of the same sex. These responses were used to generate *sexual debut*, where a value of 1 indicates respondents have experienced their sexual debut, and a value of 0 indicates they have not. These responses were cross-checked using the questionnaire items: "how many times have you had intercourse/relations in the past year"; "at what age did you first

[4] Seven of these respondents were 17 or younger at age of first marriage, the remaining 23 were all 18 at age of first marriage.

have sexual intercourse/relations?"; and "how many sexual partners have you had in the past year?". While *sexual debut* and *romantic activity* are somewhat correlated in the adolescent sample (tetrachoric α=0.31), many adolescents in this sample report sexual activity without reporting a romantic relationship and vice versa. Therefore, I control for these experiences separately in H_1 analyses.

Adult were asked in all waves whether or not they were currently married at time of the survey. These responses were used to generate a marital status variable. *Married* takes a value of 1 if respondents were married, and 0 if respondents were unmarried. Missing values were imputed as 1 if adult respondents confirmed they had not filed for divorce, experienced the death of a spouse, or started a new romantic relationship in the past year. Missing values were imputed as 0 if respondents reported filing for divorce or experiencing the death of a spouse in the past year. This variable is used in H_2 analyses only.

Parental Control

Scholarship clearly indicates parents play an important role in encouraging or discouraging substance use, and in facilitating opportunities for child and adolescent friendship (Bahr et al. 2005; Beardslee et al. 2018; Flynn et al. 2017). Therefore, analyses include a *parental control* variable, derived from Hirschi's (1969) social control theory and Hagan et al.'s (1985) power and control theory. This measure combines responses from two questions posed to survey respondents: on a scale of one to three 1) "how likely are your parents to know who you are with when you are away from home?" and 2) "how likely are your parents to know if you are home on time?" I sum these responses and take the mean value as a time-varying measure of *parental control* experienced by respondents. I code 35 non-responses as 0 in order to maintain samples size and facilitate controls for missingness, and control for nonrandom missingness in models by

including a *missing parental control* variable where 1 indicates a non-response and 0 indicates the respondent did provide values for this measure. Coefficients for *missing parental control* are not displayed in tables. While both adults and youths were asked about their relationship with their parents, I only include *parental control* in models predicting adolescents' underage drinking and drug use.

Demographic Characteristics

Finally, several background and contextual controls were added to models, including age, respondent sex, race/ethnicity, and household income (in 10,000s). Respondent sex is measured using a dichotomous *female* variable where 1 is female and 0 is male. The DYS sample is plurality Hispanic/Latino and less than 10% White Non-Hispanic. The DYS was not designed in such a way as to capture race and ethnicity as separate constructs[5] and it is difficult to make meaningful inferences regarding the effects of racialization and xenophobia on respondent offending in this sample. I include a dichotomous control for whether or not respondents identify as *Hispanic or Latino* not because I believe it accurately captures their ethnicity, but because it likely correlates with consequences of racialization pertinent to the study of crime, such as residency in resource-poor neighborhoods, exposure to gang violence, and experiences with police and policing. Household income was reliably reported across several dimensions in the

[5] Respondents could select one option from a list of fourteen races, ethnicities, nationalities, and citizenship statuses in response to the question: *Which one of these groups best describes you*? The DYS does not differentiate between Hispanic (i.e. persons descended from Spanish speaking populations) and Latino (i.e. persons from or descended from Latin America) identities. There is evidence in the survey responses that respondents – particularly non-White Latino respondents – found this question format confusing. For example, one respondent identified as Hispanic (an ethnicity), Native American (a racial category), Mexican (a nationality), and Mexican-American (a citizenship category) at different time points in the survey. We can infer this respondent is of indigenous Mexican heritage, a person of color, and is Hispanic and Latino, though this requires a number of assumptions on the part of the coder. Ultimately this person is coded as "Hispanic/Latino."

DYS. First, respondents of all ages were asked to estimate their household income. Second, respondents' parents were asked to report their household income in a separate, supplemental parents' survey. Third, adult respondents were asked to report their household incomes and

Table 1. Descriptive Statistics for the Denver Youth Survey Sample

	Adolescents			Adults		
	N	μ	SD	N	μ	SD
Heterosocial Adolescent Group Membership (0-1)	4,851	0.41	-	2,525	0.43	-
Focal Independent Variables						
Underage Drinking (0-1)‡	4,851	0.07	-	1,064	0.16	-
Drug Use (0-1)	4,851	0.21	-	2,525	0.35	-
Adolescent Drinking (0-1)†	4,851	0.25	-	2,525	0.25	-
Adolescent Drug Use (0-1)†	4,851	0.50	-	2,525	0.48	-
Peer Behaviors						
Peers' Drinking (0-4)‡	4,851	1.16	1.32	2,448	3.07	1.45
(0) None of my peers drink alcohol	2,029	-	-	402	-	-
(1) A few of my peers drink alcohol	1,455	-	-	691	-	-
(2) Half/some of my peers drink alcohol	399	-	-	277	-	-
(3) Most of my peers drink alcohol	517	-	-	481	-	-
(4) All of my peers drink alcohol	451	-	-	597	-	-
Peers' Drug Use (0-4)	4,851	0.94	1.25	2,525	1.31	1.33
(0) None of my peers use drugs	2,519	-	-	862	-	-
(1) A few of my peers use drugs	1,190	-	-	847	-	-
(2) Half/some of my peers use drugs	396	-	-	257	-	-
(3) Most of my peers use drugs	395	-	-	286	-	-
(4) All of my peers use drugs	351	-	-	273	-	-
Peer Group Characteristics						
Peer Group Size (1-4)	4,851	2.35	1.10	2,525	2.06	1.08
(1) I have 1-3 people in my peer group	1,307	-	-	980	-	-
(2) I have 4-5 people in my peer group	1,642	-	-	823	-	-
(3) I have 6-7 people in my peer group	813	-	-	302	-	-
(4) I have 8 or more people in my peer group	1,089	-	-	420	-	-
Attachment to Peers (1-5)	4,851	4.00	0.70	2,525	3.92	0.80
(1) I strongly disagree that I feel close to my friends	29	-	-	18	-	-
(2) I disagree that I feel close to my friends	223	-	-	179	-	-
(3) I neither agree nor disagree that I feel close to my friends	347	-	-	271	-	-
(4) I agree that I feel close to my friends	3,279	-	-	1,579	-	-
(5) I strongly agree that I feel close to my friends	873	-	-	478	-	-
Sexual & Romantic Activity						
Sexual Debut (0-1)‡	4,851	0.56	-	2,525	0.96	-
Romantically Active (0-1)‡	4,851	0.60	-	2,525	0.37	-
Married (0-1)†	4,735	0.006	-	2,525	0.18	-
Parental Influence						
Parental Control (0-3)‡	4,851	2.59	0.54	2,525	2.25	0.97
Missing Parental Control (0-1)‡	4,851	0.01	-	2,525	0.12	-
Demographic Characteristics						
Age (11-18; 19-26)	4,851	14.87	2.07	2,525	21.40	2.03
Female (0-1)	4,851	0.48	-	2,525	0.52	-
Hispanic/Latino (0-1)	4,851	0.50	-	2,525	0.47	-
Income in 10,000s (0-30)	4,851	1.70	1.60	2,525	2.12	2.15

†Variable not included in analyses for adolescents

‡Variable not included in analyses for adults

individual salaries. Parents' household income reports were prioritized among respondents who report living with their parents. Where parental responses were missing, focal respondent estimates are used. Adult responses for household income are prioritized among adults who no longer live with their parents. Where adult household income is not reported and adults do not live with their parents, adult salaries are used to estimate annual *income in 10,000s*. Descriptive statistics are displayed in Table 1.

Model Selection

Hypothesis tests were conducted using logistic regression models with random intercepts to correct dependent observations among individuals across waves. Given the binary dependent variables and observation-interdependence introduced by respondents across time, tests of this paper's hypotheses are conducted using random intercept logistic regression models. The model outputs are displayed in logit coefficients (the probability of a one-unit change on the logit of the dependent variable) and their standard errors, as well as odds ratios (exponentiated logit coefficients).

Results

H_1: Adolescent Heterosociality and Adolescent Substance Use

As shown in Table 2, Results somewhat support the hypothesis that adolescents in the predominantly heterosocial group are more likely to self-report underage drinking and drug use

Table 2. Logit models regressing underage drinking and drug use on membership in the predominantly heterosocial adolescent group

	Drinking		Drug Use	
Observations (*N*)	4,851		4,851	
Individual Respondents (*n*)	1,419		1,419	
	Logit Coefficient	Odds Ratio	Logit Coefficient	Odds Ratio
Intercept	-7.43*** (0.88)	0.00	-6.65*** (0.67)	0.00
Focal Variables				
Heterosocial Adolescent	0.33* (0.14)	1.39*	0.08 (0.11)	1.08
Drinking$_{(t-1)}$	0.95*** (0.26)	2.58	0.49** (0.19)	1.64
Drug Use$_{(t-1)}$	0.03 (0.16)	1.03	0.95*** (0.14)	2.59
Peer Behaviors				
Peers' Drinking	0.57*** (0.07)	1.77	-0.01 (0.05)	0.99
Peers' Drug Use	0.17* (0.07)	1.18	1.04*** (0.06)	2.84
Peer Group Characteristics				
Peer Group Size	0.22*** (0.06)	1.25	0.15** (0.05)	1.16
Attachment to Peers	-0.04 (0.09)	0.96	0.20** (0.07)	1.22
Sexual & Romantic Activity				
Sexual Debut	0.32 (0.19)	1.38	0.94*** (0.14)	2.56
Romantically Active	0.21 (0.15)	1.24	0.55*** (0.11)	1.73
Parental Influence				
Parental Control	0.15 (0.13)	1.16	0.05 (0.10)	1.05
Demographic Characteristics				
Age	0.10* (0.04)	1.11	0.07* (0.03)	1.08
Female	0.26 (0.14)	1.30	0.05 (0.11)	1.05
Hispanic/Latino	0.15 (0.14)	1.16	0.01 (0.11)	1.00
Income in 10,000s	0.05 (0.03)	1.05	-0.00 (0.03)	1.00
Fit Statistics				
BIC	2121.798		3133.645	
Log Likelihood	-988.76		-1494.684	

*p≤0.05; **p≤0.01; ***p≤0.001

Standard errors appear in parentheses

than adolescents in the predominantly homosocial group. Results indicate the odds for underage drinking among predominantly heterosocial adolescents are greater than their homosocial counterparts, in support of H_1. Being a member of the predominantly heterosocial adolescent group results in a 0.33 increase in $log(\frac{p}{1-p})$, or logit(p), where p equals the probability of underage drinking. Assuming all other covariates in the model are fixed, being a member of the predominantly heterosocial adolescent group results in a 39% increase in respondents' odds of reporting underage drinking in a given wave. Importantly, in this scenario our baseline respondent has a few friends who engage in substance use, a history of substance use themselves, and a moderately sized peer group of 4-5 people. The substantive influence of heterosociality is contingent on other correlates of drinking and drug use. If I shift my baseline to analyze respondents who do not report any substance use in the prior year and do not have peers who engage in substance use I find being a member of the predominantly heterosocial adolescent group will result in a 43% increase in respondents' odds of reporting underage drinking in a given wave (assuming other covariates in the model are fixed).

Predominantly heterosocial adolescents have odds of drug use slightly higher than their homosocial peers. However, this result is substantively small and is not statistically significant. Predictably, past substance use is associated with future substance use across analyses and peers' substance use is an important and influential predictor of both drinking and drug use in these models. Supplemental analyses indicate peers' drug use, specifically, renders any influence of adolescent heterosociality on respondent drug use moot. Overall, a one unit increase in peers' alcohol and drug using behaviors is associated with 1.77 and 1.18 odds increases in adolescent respondents' reporting drinking, respectively.

Peer group size and attachment to peers are also important correlates of adolescent substance use, though their influence manifests differently across drinking and drug use. Adolescents in larger peer groups have higher odds of drinking and doing drugs. Adolescents who report feeling close with their friends also have slightly higher odds of drug use, but this result is not statistically significant. Romantic activity and sexual debut are of little importance in models predicting underage drinking, but are associated with increased odds of adolescents' drug use. Romantically active adolescents haver higher odds of using drugs than their inactive counterparts, as do adolescence who have had their sexual debut. Finally, while most studies on substance use indicate boys and men engage in these behaviors more frequently than do girls and women (Barnes, Welte, and Hoffman 2002), girls in this sample do not appear to be at greater risk of underage drinking or drug use than are boys. Supplementary analyses that include interaction terms to account for the unique effects of being a predominantly heterosocial girl (*female×heterosocial adolescent*), and being a girl with lots of substance abusing peers (*female×peers' drinking*; *female×peers' drug use*) bore no significant results. While not the focus of this manuscript, the apparent lack of a gender gap in adolescent substance use behaviors is an interesting finding whose origins deserve further scrutiny.

Given prior research suggests other-sex peers may hold a special kind of sway over adolescents' substance use decisions (Kreager and Haynie 2011) a second set of models were run with interaction terms for adolescents' categorization as predominantly heterosocial and their peers' drinking and drug use behaviors (*heterosocial adolescent×peers' drinking*; *heterosocial adolescent×peers' drug use*). I find no evidence, however, that adolescents in the predominantly heterosocial group are more suspectable to peer influence than are adolescents in the

predominantly homosocial group. BIC values indicate the model displayed in this paper is a slightly better fit to the data, and interaction terms are not statistically significant.

H_2: The Enduring Influence of Adolescent Heterosociality on Drug Use

Table 3. Logit models regressing adult drug use on heterosocial histories

	Model I		Model II	
Observations (*N*)	2,525		2,525	
Individual Respondents (*n*)	906		906	
	Logit Coefficient	Odds Ratio	Logit Coefficient	Odds Ratio
Intercept	-4.92*** (0.95)	0.01	-5.19*** (0.97)	0.00
Focal Variables				
Heterosocial Adolescent	0.09 (0.19)	1.10	0.84** (0.28)	2.31
Adolescent Drinking	1.43*** (0.22)	1.84	1.45*** (0.22)	1.90
Adolescent Drug Use	0.61** (0.23)	4.20	0.64** (0.23)	4.26
Interaction Term				
Heterosociality × Peers' Drug Use	-	-	-0.49*** (0.13)	0.61
Peer Behaviors				
Peers' Drug Use	1.20*** (0.07)	3.31	1.43*** (0.10)	4.20
Peer Group Characteristics				
Peer Group Size	0.12 (0.07)	1.12	0.11 (0.07)	1.12
Attachment to Peers	0.37*** (0.10)	1.45	0.38*** (0.10)	1.46
Sexual & Romantic Activity				
Married	-0.73** (0.24)	0.48	-0.75** (0.25)	0.47
Demographic Characteristics				
Age	0.01 (0.04)	1.01	0.01 (0.04)	1.01
Female	-0.35 (0.19)	0.71	-0.35 (0.20)	0.71
Hispanic/Latino	-0.75*** (0.19)	0.47	-0.77*** (0.20)	0.46
Income in 10,000s	-0.05 (0.05)	0.95	-0.05 (0.05)	0.95
Fit Statistics				
BIC	2169.932		2163.833	
Log Likelihood	-1034.045		-1027.079	

*p≤0.05; **p≤0.01; ***p≤0.001

Standard errors appear in parentheses

As shown in Table 3, the hypothesis that heterosocial histories are associated with drug use in young adulthood is supported. In Model I, it appears heterosocial histories are not associated with young adults' drug use, and that respondents' own substance use histories and peer influences absorb any influence of heterosocial histories on young adults' drug use – as they do in H_1 tests. However, results from Model II, which includes an interaction term for categorization as an adolescent member of the predominantly heterosocial group and adults' peers' drug use behaviors, suggest heterosocial histories do have implications for drug use in young adulthood. Model II results show young adults who spent most of their adolescence in mixed-sex peer groups have considerably higher odds of using drugs in the past year than do formerly homosocial young adults, but only if they do not currently count any drug-using peers in their peer groups. Holding all other things equal, respondents with a history of adolescent substance use and no drug-using peers see their odds of drug use increase by 131% if they were members of the predominantly heterosocial adolescent trajectory group. Among young adults who do report drug-using peers, heterosocial histories may provide a small, but statistically significant protective effect against drug use. Formerly heterosocial respondents with drug-using peers are slightly *less* likely than are formerly homosocial respondents, and/or respondents with no drug-using peers, to report drug use.

While statistically significant, results also show these protective effects are small and unlikely to counteract the outsize influence of drug-using peers on young adults' drug use. A one-unit increase in peers' drug use is associated a 232% increase in the odds that young adults will report drug use, holding all other covariates constant. In this scenario, the baseline respondent has a history of adolescent substance use. All other things equal, respondents who abstained from substance use throughout adolescence see their odds of drug use increase by

317% with everyone one-unit increase in peers' drug use. Analyses run with the categorical interaction term disaggregated into dichotomous outcomes supports initial interpretations of results and further clarifies under which circumstances heterosocial histories are most important.

Table 4a. Cross-Tabs for Heterosociality in Adolescence and Drug Use Among Adults' Peers

	Number of Drug Using Peers					
Heterosocial Adolescent?	(0) None	(1) A Few	(2) Some/Half	(3) Most	(4) All	*Total*
(1) Yes	311	394	126	134	111	*1,076*
(0) No	551	453	131	152	162	*1,449*
Total	*862*	*847*	*257*	*286*	*273*	*2,525*

Table 4b. Interaction Term Frequencies: Heterosocial Adolescent × Peers' Drug Use

Homosocial Adolescents & Adolescents without Drug-Using Peers	Heterosocial Adolescents with Drug-Using Peers				
(0)	(1)	(2)	(3)	(4)	*Total*
1,760	394	126	134	111	*2,525*

Table 4c. Categorical Interaction Term Coefficients

	Model III	
Observations (*N*)	2,525	
Individual Respondents (*n*)	906	
	Logit Coefficient	Odds Ratio
Focal Variables		
Heterosocial Adolescent	-0.12 (0.38)	0.88
Peers' Drug Use	1.45*** (0.10)	4.17
Heterosocial Adolescent × Peers' Drug Use		
(1) Heterosocial adolescents who report a few of their friends use drugs	0.83* (0.36)	2.29
(2) Heterosocial adolescents who report some or half of their friends use drugs	0.43 (0.46)	1.54
(3) Heterosocial adolescents who report most of their friends use drugs	-0.39 (0.51)	0.68
(4) Heterosocial adolescents who report all of their friends use drugs	-1.76** (0.59	0.17
Fit Statistics		
BIC	2163.561	
Log Likelihood	-1015.191	

*p≤0.05; **p≤0.01; ***p≤0.001
Standard errors appear in parentheses
Control variable coefficients not displayed

As seen in Table 4, in models where the interaction term is disaggregated by category (i.e. Model III) the positive, significant effect of having been an adolescent member of the predominantly heterosocial group, apart from drug-using friends is no longer present. Taken with the other regression results, this seems to imply adolescents' heterosocial histories are only salient in two of the peer contexts captured here. First, young adults with very few drug-using friends experience some negative, lingering effects of adolescent heterosociality. Formerly heterosocial young adults with few drug-using peers are more likely to report drug use than are formerly homosocial young adults and young adults with no drug-using friends. Second, on the other end of the spectrum, for young adults in groups where all of their peers use drugs, heterosocial histories seem to protect them from engaging in drug use. The odds this group will report drug use are much lower than for formerly homosocial young adults and young adults with no drug-using friends[6]. The BIC indicates differences in the explanatory powers of Models II and III are negligible, and coefficients for other controls, displayed in Table 3, are substantively unchanged. Thus, we must rely on theory to determine which of these results are most reflective of the true influence of adolescents' mixed-sex peer groups on their drug use in adulthood, and I elaborate on this in the Discussion and Conclusion section of this manuscript.

There are several additional findings of note. The more strongly respondents agree they "feel close" to their peers, the more likely they are to use drugs. While attachment to peers is sometimes touted as deterring deviant behavior (Gottfredson and Hirschi 1990), this finding somewhat aligns with differential association theory in that adolescents who are more intensely

[6] Both sex-split models and models that include interactions between being female and group membership, and being female and having drug-using peers, indicate these findings hold for both men and women. That is, there is no evidence the illicit drug use of men and women are differentially influenced by their adolescent peer group membership.

bonded with their peers likely spend more time and interactional energy in these peer groups, and are therefore more likely to develop favorable attitudes towards what their peers deem favorable – including drug use (Bahr et al. 2005; Sutherland et al. 1992). Not all close ties, however, lead to drug use. Consistent with prior findings on heterosexual marriage (Laub and Sampson 2006; Sampson et al. 2006), the odds married respondents will report drug use are lower than the odds unmarried respondents will report drug use. As with H_1 analyses, there is no evidence women are at greater risk of reporting drug use than are men. Race and ethnicity, while statistically unimportant in H_1 tests, are more impactful here. The odds that Hispanic and/or Latino respondents will report drug use are considerably lower than those for non-Hispanic and/or Latino youths. Given the many issues with how the DYS collected data on race and ethnicity I caution readers against drawing strong inferences from this finding. Having reviewed the original race and ethnicity responses for clues to national origin, I tentatively put forth that many Hispanic and/or Latino respondents in the DYS are either immigrants or children of immigrants. This population is repeatedly shown in criminological research to engage in less crime than are native born Americans and children of native born Americans (Ousey and Kubrin 2018; Reid et al. 2005). Thus, in this case, the protective effect of being Hispanic or Latino may have less to do with ethnicity, and more to do with national origin.

Discussion and Conclusions

Heterosociality and Adolescent Substance Use

Overall, results support the hypothesis that adolescents' sex-based peer group sorting patterns are associated with adolescent drinking and adult drug use, though they have little impact on adolescent drug use. H_1, *adolescents in the predominantly heterosocial group are more likely to self-report underage drinking and drug use than adolescents in the predominantly homosocial*

group is supported for underage drinking, but not drug use. Further, I find no evidence that predominantly heterosocial adolescents are more susceptible to the influence of delinquent peers than are predominantly homosocial adolescents. I invoke differential social organization and association theories to better understand associations between adolescents' underage drinking and their peer group sex composition. First, I argue mixed-sex peer groups are more likely to exist at the periphery of adult-controlled spaces due to their associations with sexual activity, and are therefore more able diffuse definitions favorable to underage drinking among their members. Second, I argue the values and norms held by mixed-sex peer groups are more likely to be incompatible with the institutional contexts in which these groups are embedded than are the values and norms held by same-sex peer groups, in which case mixed-sex peer groups may be more likely to deliberately organize around behaviors in opposition to institutional norms. In both cases, I argue mixed-sex peer groups are more likely to cultivate intense feelings of group belonging (i.e. a strong collective consciousness) among members (Jenks 2004), even if they do not encourage strong interpersonal bonds between members.

The fact that adolescents in the predominantly heterosocial group are more likely to engage in underage drinking than are their adolescents in the predominantly homosocial group, net of romantic and sexual activity and parental control, is an important finding. Research often centers the role of other-sex sexual and romantic partners in explanations of how mixed-sex peer groups propagate substance use, and it can be difficult to disentangle the influence of other-sex individuals from the influence of mixed-sex peer groups. Further, given parental opposition to teenagers' romantic and sexual activity (Regnerus and Regnerus 2007) it is reasonable to expect that the influence of mixed-sex peer groups has more to do with the absence of adult supervision than the sex composition of the peer groups. However, I find associations between

heterosociality and substance use remain even when accounting for sex, love, and parental control. I do not interpret these findings to mean dyadic intimacies or parental control are unimportant. Rather, I argue mixed-sex peer groups rise to the top of adolescents' hierarchies of influence within their wider social networks in part because of the interwoven influences of sex, romance, and parental control.

Many adolescent peer groups, including homosocial peer groups, are to an extent organized around heterosexual ritual and courting (Connolly, Furman, and Konarski 2000; Maccoby 1998)[7]. Methods of courting include establishing popularity amongst peers (thus increasing one's dating capital) and seeking physical spaces that allow enough privacy to comfortably engage in physical intimacy. While same-sex peer groups may transmit some definitions favorable to substance use to their members, their sex-composition means these groups are less practiced or desiring of seeking spaces to convene as a group away from parental or institutional control. Thus, adolescents in these groups are more likely to encounter conventional (or at least adult-endorsed) definitions of substance use, and have fewer opportunities to turn definitions favorable to substance use to action. Mixed-sex peer groups, however, may be considered deviant by virtue of their existence, and members therefore must convene away from the prying eyes of adults. This oppositional quality of mixed-sex peer groups may increase feeling of cohesion amongst members (i.e. the intensity of group bonds), decrease exposure to out-group norms (i.e. counter-definitions of substance use), and necessitates occupation of physical spaces where drinking and drug use are possible. Further, romantic and intimate activity require some modicum of privacy,

[7] Same-sex attracted adolescents and/or adolescents who identify as LGBTQIA (i.e. queer adolescents) likely experience these groups and their norms differently than do heterosexual adolescents. However, the homo- or heterosociality of these spaces is a group-level characteristic that exerts pressure on the entirety of their membership. Thus, while queer adolescents may not act on group definitions related to sex and romance, they are still exposed to and impacted by group-level definitions of delinquent and substance use behavior.

and adolescents who wish to engage in such behaviors must actively seek opportunities away from the prying eyes of parents, teachers, and other forms of adult control. Thus, definitions cultivated and disseminated by mixed-sex peer groups may be met with limited instantaneous pushback relative to same-sex groups able to convene freely around adults who provide negative reinforcement of drinking behaviors. Mixed-sex peer groups, then, come to be broadly organized in favor of "party" or "pseudomature" behaviors that boost adolescent popularity and enable sexual activity, such as underage drinking (Allen et al. 2014; Gordon Simons et al. 2018; Hagan 1991). Results are consistent with prior research suggesting criminogenic proclivities of mixed-sex peers are influential in both group and dyadic contexts. As in this study, Kreager and Haynie (2011), find intimate partners and other-sex peers exert separable and meaningful influences on adolescent drinking. Other-sex peers brought into networks by intimate partners are even more influential on individuals' underage drinking than are the partners themselves, and the authors theorize this is because adolescents want to maximize time with their romantic partners, and spending time with their (usually other-sex) partner's friends is one way to do so. Taken together, these findings suggest mixed-sex peer groups are initially organized around a particular goal – time with romantic partners – and that underage drinking is understood by members as a pathway to this goal. Thus, adolescents in these groups associate underage drinking with a desirable outcome and the behavior diffuses throughout the group until it becomes something around which the group itself is organized.

While adolescents' peer groups are a primary source of definitions favorable to underage drinking, differential social organization theory acknowledges individuals and their peer groups as nested within larger social contexts that can ameliorate or exacerbate the groups' deviant predilections by offsetting definitions "favorable" to crime (Matsueda 2006). Given there are

social and institutional contexts where mixed-sex mingling can, itself, be considered deviant, it is possible the sex composition of peer groups signals not just an in-group culture amenable to substance use, but the strength of institutional power in opposition to these behaviors. While I cannot directly address institutional structures in my analyses, Kreager et al.'s (2011) research regarding adolescents' delinquent peer groups strongly suggest groups' structural properties encourage delinquent behaviors, and one the properties implicated is sex composition. Specifically, they suggest mixed-sex peer groups undermine structural contexts of school-based friendship groups that would otherwise prevent or deter delinquent behavior (2011:120). Findings therefore suggest mixed-sex peer groups are problematic, in part, because in-group norms and values are not congruent with the institutions in which they are embedded. This viewpoint suggests the criminogenic influence of mixed-sex peers should lessen when these groups are embedded in institutional contexts that facilitate or normalize other-sex socialization, and this is indeed what Faris and Felmlee (2011) find in their research on same- and cross-gender aggression. Specifically, the authors found high school students' mixed-sex peer groups were associated with aggressive behaviors if, and only if, those groups were embedded in schools where opportunities for other-sex interactions were rare. Teenagers in mixed-sex peer groups that were embedded in schools where other-sex interaction was common were little-influenced to aggression by the sex composition of their peer group.

The fact that persistent heterosociality in adolescence is associated with underage drinking, but not drug use, clearly demonstrates the limits of theorizing mixed-sex peer groups as broadly associated with delinquency. While underage drinking is positively associated with adolescent membership in the persistently heterosocial group, net of drinking and drug-using peers, the same cannot be said for adolescent drug use. Peer's drug use exerts the largest, and most

consistent influence on adolescent drug use, net of parental influence, substance use histories, and sexual and romantic activity. While this finding seems to indicate adolescents' mixed-sex peer groups are not organized in favor of drug use, H_2 results indicate these same groups may disseminate definitions specific to drug use in adulthood, or that the meanings assigned to drug use are vulnerable to redefinition due to cognitive shifts in young adulthood.

The Enduring Influence of Heterosociality on Young Adults' Drug Use

The sex composition of adolescent peer groups is an important predictor of young adults' drug use. H_2, *heterosocial histories are associated with drug use in young adulthood,* is supported. Generally speaking, heterosocial histories increase young adults' odds of reporting drug use in a given year, net of adolescent substance use histories and peers' substance use. However, the influence of heterosocial histories in these analyses is contingent on the proliferation of drug using peers in young adults' peer groups. While formerly heterosocial young adults with few or no drug using peers are more likely to use drugs than are their homosocial counterparts, formerly heterosocial young adults embedded in peer groups where most or all of their peers use drugs may actually be more resistant to drug use than formerly homosocial young adults. These differences in the influence of heterosociality across time and peer contexts signal a complicated interplay among the group dynamics and processes that lead to drug use and cognitive shifts in adulthood. I argue the pseudomature meanings associated with adolescent substance use are transformed in young adulthood among those who encounter "hooks" for change (Giordano et al. 2002), and that people in drug-saturated social contexts are more likely to encounter these hooks. Specifically, given mixed-sex peer groups are associated with higher rates of substance use and delinquency, it is likely that formerly heterosocial young adults have been exposed to peers and acquaintances for whom these behaviors have had

severely deleterious effects. Young adults formerly embedded in mixed-sex peer groups and currently embedded in social networks where drug use is common have been exposed to the negative consequences of their peers' substance use more frequently and for a longer duration than formerly homosocial young adults. Prolonged drug use at the group-level weakens within-group social bonds, decreasing the intensity of interpersonal relationships among group members (Ford 2005) and increasing negative associations with drug use (or definitions unfavorable to drug use). Further, bearing witness to the long-term consequences of drug use may recolor young adults' recollections of their adolescent exploits in mixed-sex groups. Recalling the time a peer passed out on the couch at a fun teenage party will likely evoke conflicting emotions if that recollection is clouded by recent experiences with drug overdoses, job loss, and relationship dissolution. Phrased another way, results indicate a certain subset of formerly heterosocial young adults are in the midst of a cognitive transformation (Giordano et al. 2002), and that part of this transformation includes transposing new, unfavorable definitions of drug use atop the favorable definitions of their adolescence. Conversely, formerly heterosocial young adults who have historically counted few drug-users among their peers may continue to associate drug use with positive, social outcomes because they are less likely to be confronted with experiences and definitions to the contrary.

Differential social organization is an ideal theoretical framework for understanding the shifting, but enduring influence of adolescents' mixed-sex peer groups on delinquency in general, and substance use in particular. In addition to further developing this theory for use in peer contexts, this research is the first to empirically demonstrate patterns of sex-based peer sorting in adolescence and to show these patterns influence adolescent and adult substance use behaviors. Mixed-sex peer groups are organized in favor of underage drinking in adolescence,

net of sexual and romantic activity and parental control. Their influence continues in adulthood, as adults' heterosocial histories predict drug use. Given institutional contexts are one of several possible drivers of these relationships, future research should account for the wider social networks in which adolescent peer groups are embedded in discussions on the criminogenic influence of mixed-sex peer groups and other-sex peers.

CHAPTER 3:

The Early Occupational Outcomes of Heterosocial Adolescents

How the sex composition of adolescent peer groups predicts young adults' experiences with - incongruent occupations and occupational sex segregation

Abstract

Sex-based patterns of occupational segregation and selection is a pervasive problem in the United States, and supply-side arguments as to how these patterns are reproduced often focus on the transmission of gendered beliefs regarding knowledge, skills, and abilities. While many of these research efforts discuss how adolescent experiences shape gender beliefs, few, if any, have examined the relationship between the sex composition of adolescent peer groups and occupational selection. This research identifies two distinct patterns of sex-based peer group sorting in a sample of at-risk adolescents, and finds these patterns predict occupational selection and segregation in young adulthood. Heterosocial adolescents are more likely to enter sex-incongruent occupations as young adults, but only if those occupations are not characterized by a high degree of sex-segregation. Among young adults in sex-congruent occupations, heterosocial histories are associated with higher odds of working in an field characterized by a high degree of sex segregation. I employ the gender role socialization perspective and gender beliefs to explain how and why same- and mixed-sex peer groups transmit alternative and hegemonic gender beliefs to members.

Introduction

Occupational sex segregation is a pervasive problem in the United States, and many workplaces are characterized by high degrees of sex segregation (Blau, Brummund, and Liu 2012; Glass 1990). The consequences of sex segregation are far reaching, and women's socioeconomic prospects in particular suffer as feminized occupations are socially and economically undervalued, and masculinized occupations present both interactional and structural barriers to women's entry in the form of sexism and policy (Howe 1977; Padavic and Reskin 2002). Although sex segregation is present across the full spectrum of the labor force, we know considerably more about the mechanisms that cause, reproduce, and ameliorate these inequalities among higher prestige and higher socioeconomic workers than among working class, unsalaried, and early-career workers (Torre 2019). Further, while "professional" jobs are becoming less segregated by sex (Charles and Grusky 2005), the same cannot be said for entry-level and working class occupations (Torre 2019). Theories developed to explain women's vertical gains in the labor market – many of which focus on the intergenerational effects of higher education – cannot fully explain the persistence of sex segregation in working class and early-career occupations that do not require advanced degrees.

Determinants of occupational sex segregation are often presented in two categories: Supply-side (i.e. job-seeker and interactional) explanations, and demand-side (i.e. employer and structural) explanations. One common supply-side approach to understanding occupational sex segregation is the gender role socialization perspective, which posits men and women's skills and preferences are developed per sex-typed cultural standards (Marini and Greenberger 1978; Okamoto and England 1999), the implication being that men and women respectively gravitate towards occupations that allow them to cater to these skills and preferences. This theory remains

particularly salient in studies on working-class populations, as the gender-egalitarian attitudes that have likely increased sex integration in professional, white-collar occupations are thought to be less common among working-class and/or blue-collar workers and labor markets (Polavieja and Platt 2014; Torre 2019). Contexts wherein gender socialization helps reproduce labor market inequalities are well-researched, but while research has enumerated how gendered preferences for care work, opportunities for masculine posturing, and prestige act as determinants of sex segregation (Correll 2004; Fejes and Haake 2013; Prokos and Padavic 2002), there is surprisingly little research on whether or not preferences regarding the sex *composition* of one's social network influences occupational outcomes. This research therefore focuses on examining associations between the sex composition of adolescent peer groups and young adults' occupational outcomes. One of many consequences of focusing on mid- to late-career and professional labor market outcomes in weaving together explanations of sex segregation is that the true influence of adolescent milestones and experiences on career selection and success may be underestimated. Many researchers have emphasized how the educational choices and preferences of adolescents and young adults are influenced by their environment and predict selection into sex-segregated workspaces (Correll 2001; Hartnagel and Krahn 1989; Marini and Greenberger 1978; Watts et al. 2015). Far fewer, however, have focused on how peer contexts in general and the sex composition of these contexts in particular influence young people's early-occupational outcomes (Liem and Martin 2011; Watson, Quatman, and Edler 2002).

Adolescence is characterized by substantial changes in the composition of peer groups and peer interactions, particularly in regards to exposure to other-sex peers. In childhood, sex stands out as an organizing principle of peer groups, and same-sex peer groups are the norm (Burton Smith et al. 2001; McPherson et al. 2001; Thorne 1993). In adolescence contact with mixed-sex

peers increases substantially, and while mixed-sex friendships are both common and normative (Kuttler et al. 1999; Mehta and Strough 2009; Monsour 2002), many young people drift towards and away from such relationships throughout adolescence. Individual exposure to opportunities for mixed-sex socialization are largely shaped by socioeconomic, familial, and school contexts – such as ability to afford and access mixed-sex extracurriculars, parental and educator attitudes toward mixed-sex socialization, and school policies regarding mixed-sex classes and activities. These contexts have also been found to influence career selection, success, and sex segregation (Morgan, Gelbgiser, and Weeden 2013; Polavieja and Platt 2014; Roos and Stevens 2018), and their effects on sex segregation are well-explored.

The goal of this research is to establish a starting point of inquiry on the enduring influence of adolescents' sex-segregated or integrated peer groups. I argue same- and mixed-sex peer groups are organized in favor of distinctly different goals in adolescence and that these differences give rise to differences in adolescents' *gender beliefs* (Correll 2001, 2004), which in turn lead to differences in young adults skills, preferences, and opportunities. For example, young adults who spent the majority of their adolescence in mixed-sex peer groups may prefer workplaces that mimic the sex and gender composition of those groups. In addition, or perhaps alternatively, these adults have had fewer opportunities to engage in sex-atypical behaviors as adolescents, as their mixed-sex peer groups may have been organized in favor of reproducing heterosexual and patriarchal norms.

I focus specifically on the occupational contexts of young adults from low-income, high-risk environments for several reasons. First, as previously stated, sex segregation in working class and low-income occupations has remained consistent despite progress in integrating jobs in the professional, white-collar sector (Charles and Grusky 2005; Torre 2019). Second, by focusing on

the stage of the life course immediately following an event of interest (i.e. adolescent initiation into mixed-sex contexts and peer groups) I am more capable of speaking to the effect of this event before it has been exacerbated or extinguished by subsequent experiences. Third, early-occupational (and educational) experiences with sex segregation are themselves associated with later-in-life career outcomes and sex segregation (Pearlman 2018; Shauman 2016). Therefore, this line of inquiry can inform research on precursors to occupational sex segregation among adults who are more settled into their career pathways. Finally, and in regard to the likely occupational outcomes for my population of interest, prior research suggests the existence of "a societal gendering mechanism that entrenches horizontal segregation" among working class individuals (Torre 2019:433). I put forth the sex composition of adolescent peer groups, and the gender beliefs learned therein, as suspect for such a mechanism.

I use longitudinal data spanning across adolescence (ages 10-17) through young adulthood (ages 18-26) from the Denver Youth Survey (DYS) to explore the associations between sex-based peer groups sorting patterns in adolescence and young adults' occupational contexts. Specifically, I suggest that while heterosocial adolescents may be more comfortable in sex-integrated workspaces as young adults than their homosocial counterparts, the gender beliefs learned in the mixed-sex peer groups of their adolescence also help develop and reinforce preferences and beliefs for gendered divisions of labor and ability. Thus, formerly heterosocial adults may be more likely to seek highly sex-segregated occupations and less likely to work in gender-atypical, or sex-incongruent fields than their formerly homosocial counterparts.

Gender Beliefs in Adolescent Peer Groups

While research on how the sex composition of adolescent peer groups influences occupational selection in adulthood is sparse, there are likely explanations in gender

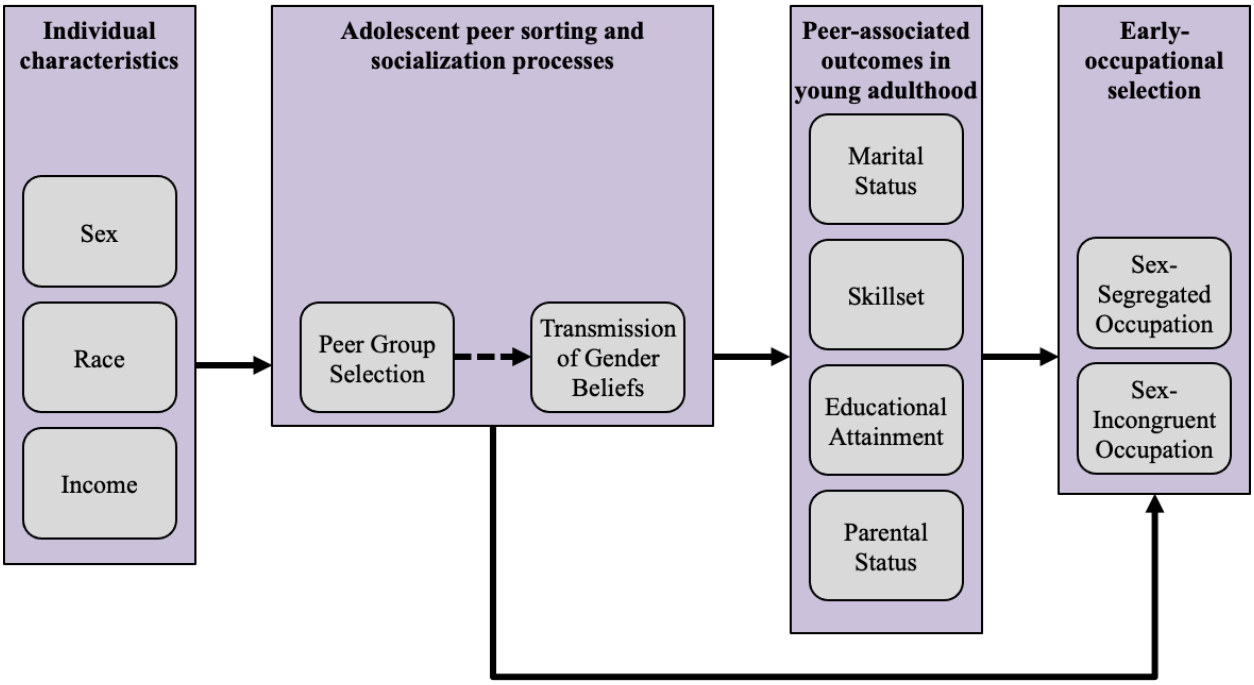
development literatures regarding how adolescent experiences prime people for sex-segregated work. Scholars of sex and gender development have established that same-sex peer groups are a defining characteristic of childhood play, and that boys and girls develop distinct "cultures of childhood" within these groups (Maccoby 1998; Stockard 2006; Valentine 2004). In adolescence contact with mixed-sex peers increases substantially (Kuttler et al. 1999; Mehta and Strough 2009; Monsour 2002), and youths are able to enact the norms and preferences learned in sex segregated childhood cultures alongside other-sex peers more often and in more intimate relationships than in childhood. Often, these interactions emphasize essentialist beliefs that certain behaviors and abilities are naturally occurring among one sex more so than others (Hill and Lynch 1983; Kohlberg and Gilligan 1971). These socialization patterns have implications for the types of extracurriculars, school subjects, college majors, and career pathways people select into throughout the life course (Correll 2001; Shauman 2016).

Scholars of occupational segregation build on these findings to explain how and why educational and career choices differ by sex, and explanations often touch on the influence of adolescent peers on the development of gender identities and beliefs. Sociologist Shelley Correll uses the term *gender beliefs* to facilitate discourse on how and why cultural beliefs about gender influence educational and occupational trajectories. Correll's work on high schoolers' gender-differentiated educational choices, for example, finds gender beliefs bias individuals' perceptions of their own competence in gender-coded tasks – such as mathematical ability – and discourage pursuance of gender atypical educational and career tracks (2001). Subsequently, these gender beliefs about one's own competence influence skill-development, aspirations, and career trajectories in adulthood (Correll 2004). This work underscores that the process of learning (and unlearning) gender beliefs begins well before young adults enter the labor market, and creates a

sex-segregated supply network that employers cannot offset through egalitarian hiring practices. Thus, although demand-side discrimination in hiring and retention practices plays a large, and important role in maintaining occupational sex segregation (England 1982), interactional histories on the supply side also pull people onto different occupational trajectories (Correll 2004).

In order to understand the influence of gender beliefs on the labor market, one must understand the social relational contexts wherein these beliefs are made real. Not everyone has access to the same "arenas where [gender] beliefs or rules are in play" (Ridgeway and Correll 2004:511), and differences in social relational histories necessarily begets difference in gender beliefs, which in turn begets difference in individual preferences that lead to occupational sex segregation. Ridgeway and Correll assert the extent to which hegemonic versus alterative gender beliefs are transmitted is heavily contingent on the structure of adolescents' social relational contexts, including whether these contexts include mixed- or same-sex peers (2004). The salience of gender in behavioral calculus is especially great in mixed-sex social relational settings (2004:517). Given hegemonic beliefs are, by definition, dominant and often held by a majority, we might reasonably expect people who spend a lot of time in mixed-sex settings will be considerably more likely to develop preferences and skills in step with traditional gender beliefs. Thus, Ridgeway and Correll's work positions the sex composition of peer groups as one of several factors that helps maintain or change gender beliefs associated with educational and career choices. Figure 1 shows the process through which adolescents' peer groups transmit gender beliefs, and where this transmission is situated relative to other determinants of occupational outcomes discussed in this dissertation.

Figure 1. Causal Order Path Diagram



Linking Gender Beliefs to Heterosociality and Occupational Outcomes

Researchers who study other-sex friendships argue such relationships serve the "special function" of allowing people to practice behaviors that are otherwise constrained among same-sex peers (Monsour 2002; Swain 1992). Where these behaviors include things like practicing a gender-atypical skillset one can see how mixed-sex peer groups could decrease the probability of entering into a highly-sex-segregated profession that expects applicants to come in with a skillset congruent with their sex. Further, individual development of sex-atypical skillsets and preferences can reasonably be assumed to increase the probability of entering into a sex-atypical occupation. However, mixed-sex peer groups also create opportunities for deviant and antisocial behaviors (Caspi et al. 1993; Kreager and Haynie 2011), which may in turn limit young people's educational and career prospects and push them into low-income and working class occupations where gender egalitarian attitudes are less common and occupational segregation by sex is

prevalent (Swerdlow 1989; Torre 2019). Given the DYS was specifically administered to gather data on youth delinquent and criminal behavior, the sample used in these analyses is at high risk for deviant and antisocial behaviors, and may therefore be at higher risk of seeing their career prospects limited by way of their heterosocial histories. Further, gender egalitarian attitudes are often tied to correlates of socioeconomic success – such as educational attainment and family income (Cotter, Hermsen, and Vanneman 2011; Pampel 2011) – and the socioeconomic precarity of the young adults in this sample means they may be less likely to be exposed to egalitarian attitudes and opportunities. They may also be more likely to organize their mixed-sex peer groups around hegemonic gender beliefs, as has been found in qualitative studies on sex and gender socialization in childhood and adolescence (Maccoby 1990, 1998; Pascoe 2011; Thorne 1993). My first hypothesis explores this supposition as it relates to selection into a sex-segregated occupation, specifically:

> *H_1: Adolescents in the predominantly heterosocial group are more likely to work in occupations characterized by a high degree of sex segregation as young adults.*

It is important to distinguish between people who enter into sex-segregated occupations congruent with their own sex and people who enter into sex-segregated occupations incongruent with their own sex. Research has found men and women in gender-atypical, sex-segregated occupations have different characteristics, motivations, and prospects than do men and women in gender-typical, sex-segregated occupations (Bansal 1993; Boyne Coats and Overman 1992; Torre 2019). It is therefore probable that the enduring influence of mixed-sex peer groups in adolescence will manifest in different ways, if it manifests at all, between these two groups. I therefore run models with- and without an interaction term for heterosocial adolescents in sex-incongruent occupations (*Heterosocial Adolescent*×*Sex Incongruent Occupation*). In addition,

the influence of having been a predominantly heterosocial adolescent, or working in sex-incongruent occupations may differ by sex. Therefore, I include interaction terms for both women who were members of the predominantly heterosocial group in adolescence (*Female×Heterosocial Adolescent*), and women who work in sex-incongruent occupations (*Female×Sex Incongruent Occupation*).

It is important to note the danger of conflating working in a sex-congruent occupation with working in an occupation characterized by a high degree of sex segregation, and to clarify what I mean by "sex-congruence" versus "gender-typical". While the ways in which heterosocial histories feed into these occupational choices certainly overlap, it is unlikely the precise mechanisms and linkages at play are identical. That is to say, just because a person works in a sex-incongruent (or gender-atypical) occupation does not mean their occupation is characterized by a high degree of sex segregation. For example, while men outnumber women in managerial food service and lodging occupations, there were still four women to every five men in that field in 1990 (U.S. Department of Commerce, Economics and Statistics Administration, and Bureau of the Census 1992). Therefore, while one can reasonably argue women who work as managers of food serving and lodging business are in sex-incongruent occupations inasmuch as they are outnumbered by men, it's a bit of a stretch to say their occupation is characterized by a high degree of sex segregation. Subsequently, people in sex-incongruent occupations, but not highly segregated occupations, are likely to have different skills and aspirations related to their occupation than are people in highly segregated spaces.

The gender beliefs and preferences learned in adolescent peer groups may push people toward sex-incongruent occupations, but not to the extent that they encourage entrance into highly sex segregated occupations. For example, heterosocial adolescents may simply desire

occupations that allow them to mimic the familiar sex composition of their adolescent peer groups. Given boys are less likely than are girls to claim membership in mixed-sex peer groups or to have other-sex friends (Mccarthy, Felmlee, and Hagan 2004; Monsour 2002), they might also be more likely to be slightly outnumbered by girls in mixed-sex peer groups. If these heterosocial boys grow are open to or desirous of imitating those sex dynamics as young adults, they may be more likely to select into sex-incongruent occupations, but not necessarily highly sex-segregated occupations. Further, girls in mixed-sex peer groups may be more amenable to adopting male-coded behaviors than boys are to adopting female-coded behaviors (Burris, Schrage, and Rempel 2016; O'Neill 2020), in which case heterosocial histories could help women develop the skills they need to succeed in male-dominated occupations. For example, women who had boys in their childhood and adolescent peer groups are more likely to enter sex-incongruent professions requiring an MBA (Boyne Coats and Overman 1992). However, hiring bias and discrimination has been shown to cut off women's access to high-paying, male-coded work more so than the inverse (Bobbit-Zeher 2011; England 1982; Okamoto and England 1999). Therefore, though women who were heterosocial adolescents may be qualified and motivated to enter highly-segregated, male-dominated occupations, their aspirations leave them vulnerable to hiring discrimination. Subsequently, they may "settle" into sex-incongruent occupation where they can still act on their skillsets and preferences in lieu of less obtainable, and highly sex-segregated work. My second hypothesis therefore explores the relationship between adolescents' mixed-sex peer groups and entry into sex-incongruent occupations:

H_2: Adolescents in the predominantly heterosocial group are more likely to work in sex-incongruent occupations as young adults.

Whether the sex composition of adolescent peer groups predict selection into a sex-segregated occupation, selection into a sex-incongruent occupation, or both, is a point of fact worth exploring. Young adults not far removed from adolescence may be especially susceptible to the enduring influence of their adolescent peer contexts, and their early-career choices and opportunities set the stage for occupational success across the life course.

Data and Methods

The Denver Youth Survey

The Denver Youth Survey (DYS) is a ten-wave longitudinal study of delinquency in "high-risk" Denver, Colorado neighborhoods. This survey, initiated in 1988, follows five youth cohorts from childhood through young adulthood. Respondents ranged in age from 7 to 16 in Wave 1and ages 17 to 28 in Wave 10. Interviewer-conducted surveys were administered annually in Waves 1-5 and 6-10, with a two-year break between waves 5 and 6. Respondents were given a child (ages 7-10), youth (ages 11-18), or adult (ages 18+) survey based on age and time since most recent interview (for more on sampling methodologies, see Huizinga, 2017). I use data from the child and youth samples to generate measures of young adults' prior sex-based peer group sorting patterns and limit my hypothesis tests to respondents aged 20 and up. All told, my sample includes 783 young adults age 20 to 26 (1,910 person-years) who reported one or more years of employment from 1993 to 1998. With the exception of variables capturing occupational sex segregation and sex-incongruent occupations, all items used in analyses are derived from the DYS. Occupational sex ratios are derived from the 1990 United States Census.

Workplace Sex Composition and Occupational Segregation

I use both the 1990 Census and the DYS to develop my measures of occupational sex segregation and sex-incongruent occupations. The 1990 Census contains detailed occupational

codes, titles, and information on the sex composition of the civilian labor force (i.e. the number of men and women surveyed in each occupation). In total, 153 of the occupations listed in the 1990 Census are represented in the sample of young adults used in these analyses. In the DYS, young adults were asked to describe their "primary job" to interviewers. Interviewers then entered this information into the survey, longhand. Responses vary in terms of specificity and clarity. Some respondents provided names of companies, positions, and descriptions of their labor such as "worked assembly line at [luggage company]" or "built modular homes". Others simply listed an occupational title, such as "recreation instructor" or "cabinet maker". Wherever possible, occupations were coded to match the most specific occupational code available in the 1990 census[1]. For example, one respondent who described their occupation as "hanging sheet metal walls – construction trades" was categorized as "sheet metal workers, except apprentices", rather than the more encompassing option of "construction laborers". I then use data from the 1990 census to determine within-occupation sex ratios of men to women by dividing the number of within-occupation male census respondents with the number of within-occupation female respondents. Using these ratios, I generated a dichotomous measure of within-occupation sex

[1] Notably, the level of occupational specificity present in the 1990 Census is, itself, reflective of sexism in the labor market. Male-dominated occupational areas are considerably more likely to include multiple categories of occupational classification, some of which are rare relative to the labor market on the whole. Female dominated occupations, however, are considerably less likely to be broken down into sub-specializations. For example, construction trades are disaggregated into 31 categories to reflect the diversity of expertise present among workers in this trade. While these occupations are male-dominated there is still significant diversity among these categories in regards to the precise ratios of male and female workers, especially with regards to supervisory positions. Female-dominated nursing trades, however, are divided into only three categories and contain no designations for nurses in supervisory positions, despite the fact that there are literally hundreds of nursing specializations within the occupation. As a result, the sex ratios calculated for nursing occupations do not reflect respondents' areas of specialization or supervisory positioning within this field as they do for construction trades and other male-typed occupations. It is likely that, as with construction trades, there is considerable variation in sex ratios between nursing specialties, but this information is simply not tracked in the 1990 Census. Subsequently, it is possible that estimates of occupational sex segregation (or sex ratios) more accurately reflect the workplace environments of people in male-typed occupations than in female-typed occupations.

segregation (*segregated workplace*) where a value of 1 indicates one sex is represented at 1.5x the other sex or greater (for example two or more men to every woman), and a value of 0 indicates neither sex is represented at 1.5x the other sex or greater.

Prior research suggests respondents in gender-atypical occupations may differ from those in gender-typical occupations in important ways (Meisenbach 2010; Padavic and Reskin 2002; Swerdlow 1989). While I cannot capture the attitudes, norms, and social expectations that feed in to how occupations are masculinized or feminized, I can capture whether respondents are in among the minority sex in their occupation. Using the census-generated sex ratios, I create a *sex-incongruent occupation* variable, where a value of 1 indicates the respondent is in the minority sex among their coworkers, and a value of 0 indicates the respondent's sex is congruent with the majority of their coworkers.

Mixed-Sex Peer Group Operationalization and Trajectory Groups

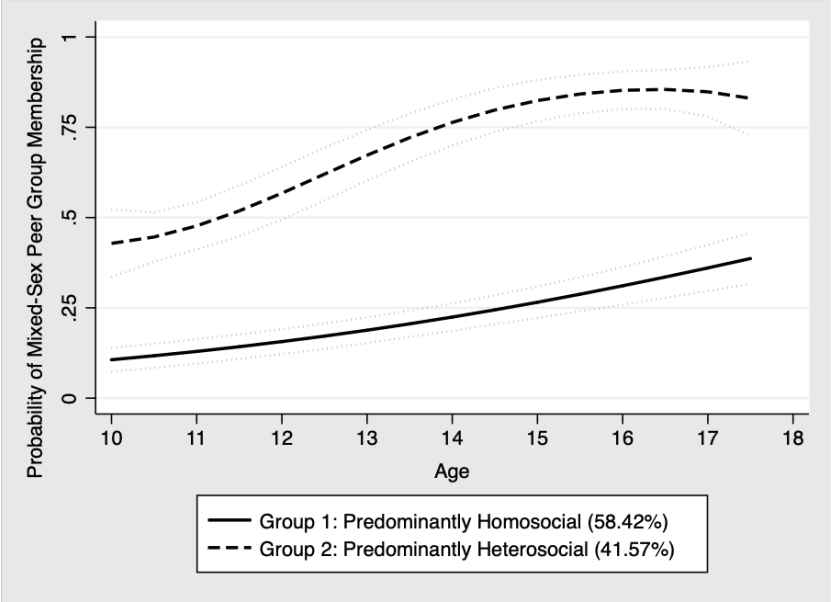
My theoretical framework suggests the overall change in the sex composition of peer groups throughout adolescence is linked to differential exposure to gender beliefs. Thus, it is necessary to capture peer group membership across time and to account for peer group membership histories. I therefore use group trajectory models to identify patterns of sex-based peer groups sorting. While the method is not without its detractors (see: Erosheva et al., 2014; Sampson & Laub, 2005), it provides "a convenient statistical approximation" (Nagin & Tremblay, 2005, p. 882) of the peer group sorting patterns of interest in this study. DYS child and youth respondents were asked a series of questions regarding the characteristics of the peer group they spent the most time with in the past year. The variable *mixed-sex peer group* was generated using responses to the question, "Are there boys and girls in your peer group?" with the options of "boys only", "girls only", or "both boys and girls". This variable, along with respondent sex, was

used to generate a dichotomous measure of whether or not the respondent reported membership in a mixed-sex peer group in a given wave. Missing values were carried forward from prior waves if, and only if, respondents reported they had not changed to a new peer group since the last survey period. I used this and other measures to execute a series group-based trajectory models to identify latent clusters of respondents who – in adolescence – follow similar sex-based peer group sorting patterns (see: Nagin, 2014; Nagin et al., 2018). This method of categorization—encouraged by Moffitt's (1993) work on offender taxonomies, and popularized following Nagin and Tremblay's (1999) application in their study on boys' physical aggression—is often used to identify distinct behavioral patterns in offending and predict long-term offending outcomes. I apply it here to approximate patterns of sex-based peer group sorting during adolescence.

Given my bivariate outcome (i.e. whether or not respondents report a mixed-sex peer group in a given wave), I specify a logistic distribution[2] and condition the outcome, mixed-sex peer group, on respondent age to determine the probability each individual respondent will claim membership in one of two trajectory groups. I use data from age ten onward to generate these trajectories because whether or not children enter adolescence as members of mixed-sex peer groups is a meaningful predictor of which sex-based peer group sorting pattern they will follow in adolescence. As per D'Unger, et al. (1998), I use the Bayesian Information Criterion (BIC) (see also: Raftery 1995) to assess model fit and determine the number of groups that best describes the data. Given there are few, if any, existing empirical efforts on sex-based peer group sorting trajectories I rely on fit statistics to determine which models best describe the data. While some research suggests variation in how and when adolescents select into peer groups will be

[2] I use the `traj` package in Stata (Jones and Nagin 2012).

Figure 2. Sex-Based Peer Group Sorting Trajectories



limited (Lipman-Blumen 1976; Maccoby 1998), model outputs indicate two to three distinctly different sorting patterns of peer group sex composition across the life course. The BIC and posterior probabilities of group membership indicate a two-group model best describes the data. The inclusion of quadratic and cubic age coefficients for one (but not both) of these groups improve the model's ability to trace these peer group sorting trajectories across adolescence[3]. Figure 1 shows the shape of two distinct trajectories of sex-based peer group sorting and the proportion of the DYS respondents who belong to each trajectory group:

1. *Predominantly Homosocial Adolescents*: Respondents in this group are more likely than not to begin adolescence in same-sex peer groups and to remain in same-sex peer groups throughout adolescence. Although their probability of reporting a mixed-sex peer group increases with age, it never exceeds 0.40. For these adolescents, the relationship between

[3] I further tested the robustness of bivariate model results by adding time-varying covariates found to be associated with adolescents' mixed-sex peer groups as specified in the first chapter of this dissertation, including romantic and sexual activity and delinquency. While several of these covariates were statistically significant predictors of group membership, model fit decreased with their inclusion and posterior probabilities of group membership were largely unchanged. Therefore, in the interest of parsimony, I use posterior probabilities of group membership as determined by the bivariate model to generate my "patterns of peer group sex composition" variables.

age and mixed-sex group membership is approximately linear and their exposure to gender beliefs espoused in mixed-sex peer groups is low.

2. *Predominantly Heterosocial Adolescents*: Although these respondents in this group are more likely than are members of the predominantly homosocial group to begin adolescence in mixed-sex peer groups, they are still more likely than not to begin adolescence in same-sex peer groups. These respondents then go on to maintain mixed-sex peer groups throughout most of adolescence. Their probability of reporting a mixed-sex peer groups increases substantially from ages 11 to 15, and while it decreases slightly in late adolescence these individuals are far more likely than not to enter young adulthood as members of mixed-sex peer groups. For these adolescents, the relationship between age and mixed-sex group membership is non-linear, and while their probability of mixed-sex group membership increases for most of adolescence, it does begin to decrease in late adolescence (around age 17). Their exposure to gender beliefs espoused in mixed-sex peer groups is high.

Posterior probabilities of group membership discriminate well, and I use them to generate a heterosociality dummy variable where 1 indicates the respondent was (more likely than not) a predominantly *heterosocial adolescent*, and 0 indicates the respondent was (more likely than not) a predominantly *homosocial adolescent*.

Respondent Characteristics

The DYS allows me to control for a number of individual characteristics typically associated with selection into a sex-segregated occupation. I control for respondent sex with a *female* dummy variable, where a value of 1 indicates the respondent is a woman, and a value of 0 indicates the respondent is a man. Given the racial and ethnic composition of the DYS – the sample is plurality Hispanic/Latino and less than 10% White – I include an ethnicity dummy

variable for where a value of 1 indicate the respondent is *Hispanic or Latino*, and a value of 0 indicates the respondent is not *Hispanic or Latino*. Models were also run using a categorical race and ethnicity variable, however substantive results did not change: race and ethnicity are not statistically significant predictors of occupational sex segregation in this sample. Respondents were asked in all waves if they had a child or if there are children living in their household. These responses were used to generate a dichotomous *parent* variable where a value of 1 indicates the respondent is a parent or guardian of a minor child, and a value of 0 indicates the respondent is not the parent or guardian of a minor child. Adults were also asked in all waves whether or not they were currently married. These responses were used to generate a marital status variable, where a value of 1 indicates respondents were *married*, and 0 indicates respondents were unmarried. Missing values were imputed as 1 if adult respondents confirmed they had not filed for divorce, experienced the death of a spouse, or started a new romantic relationship in the past year. Missing values were imputed as 0 if respondents reported filing for divorce or experiencing the death of a spouse in the past year.

Two variables are included to account for socioeconomic status and prospects of respondents. First, I include a dichotomous measure of whether respondents have graduated high

Table 1. Descriptive Statistics

	All			Men			Women		
	N	μ	SD	N	μ	SD	N	μ	SD
Focal Variables									
Segregated Workplace (0-1)†	1910	0.84	-	940	0.82	-	970	0.86	-
Heterosocial Adolescent (0-1)†	1910	0.43	-	940	0.33	-	970	0.51	-
Sex-Incongruent Occupation (0-1)†	1910	0.27	-	940	0.35	-	970	0.19	-
Respondent Characteristics									
Female (0-1)†	1910	0.51	-	940	0	-	970	1.00	-
Hispanic/Latino (0-1)†	1910	0.48	-	940	0.51	-	970	0.44	-
High School Diploma or GED	1910			940			970		
Income in 10,000s (0.10-21.04)	1910	1.97	1.64	940	1.93	1.55	970	2.02	1.72
Parent (0-1)	1910	0.18	-	940	0.17	-	970	0.19	-
Married (0-1)†	1910	0.22	-	940	0.17	-	970	0.28	-
Second Job (0-1)	1910	0.34	-	940	0.36	-	970	0.32	-

†Denotes significant sex differences in the mean (i.e. a two-tail t-test statistic of ±1.96)

school or passed a general education development exam to receive their GED. A value of 1 indicates respondents have earned a *high school diploma or GED*, and a value of 0 indicated respondents have not earned a *high school diploma or GED*[4]. Notably, given the high-risk backgrounds and contexts among respondents, high school dropouts are overrepresented in this sample relative to the general population. Second, I include a control for respondents' household *income in 10,000s*. Household income was reliably reported across several dimensions in the DYS. Respondents and respondents' parents were asked to estimate their household income. Respondent values for household income are prioritized among adults who no longer live with their parents, and parental income is prioritized among adults who do live with their parents. Where household income is not reported and adults do not live with a parent or parents, respondent salaries are used to estimate annual income.

Finally, I control for whether or not the respondent reports a second job. In addition to signaling socioeconomic precarity, having a second job may influence young adults' occupational trajectories in important ways. DYS respondents were asked to provide information regarding any secondary jobs held in the past year. The variable *second job* takes a value of 1 if respondents report having had two or more jobs in the past year, and a value of 0 if respondents report having held only one job in the past year. Regarding occupational sex-segregation people who hold multiple jobs may have fewer opportunities for promotion as they cannot devote substantial time to any one job in order to climb occupational hierarchies. Given sex-segregation is more pronounced at higher levels of occupational attainment (Roos and Stevens 2018),

[4] The DYS data I have access to regarding higher educational attainment may be unreliable. Frequencies show a suspicious number of very young college graduates, and I am unable to return to Seattle to determine whether this issue is the result of a coding error when transferring data from the original .txt files or a true reflection of respondents' educational attainment. I did run analyses using a variable to capture educational attainment past high school, and did not find any substantive changes to my results.

holding two jobs may lower the odds a respondent will select into a highly segregated occupation. In regards to selection into a sex-incongruent occupation, people who hold multiple jobs may be more likely to select into occupations that offer scheduling flexibility to accommodate multiple work schedules. Given women are thought to gravitate to more "flexible" working conditions than are men (Becker 1985), two-job-holders may be more likely to select into women-dominated occupations. Thus, men who hold two jobs may be more likely to work in sex-incongruent occupations and vise versa. Descriptive statistics are displayed in Table 1.

Modeling Strategy

In total, 783 young adults age 20 to 26 (1,910 person-years) are included in analyses. Hypothesis tests were conducted using logistic regression models with random intercepts to correct dependent observations among individuals across waves. The model outputs are displayed in logit coefficients (the probability of a one-unit change on the logit of the dependent variable) and their standard errors.

Results

Heterosociality and Occupational Sex Segregation

H_1, *adolescents in the predominantly heterosocial group are more likely to work in occupations characterized by a high degree of sex segregation as young adults*, is supported, but only among young adults working in sex-congruent occupations. Among young adults working in sex-congruent occupations, heterosociality in adolescence increases the odds of working in an occupation characterized by a high degree of sex segregation. In Models I and II, where no interaction terms are included, adolescent membership in the predominantly heterosocial group is not a significant predictor of young adults' selection into sex-segregated occupations. However,

in Models III, IV, and V we can see this is because heterosocial histories are only salient predictors of entering occupations characterized by a high degree of sex-segregation among young adults in sex-congruent occupations. This finding indicates that – as suggested in prior literature (Boyne Coats and Overman 1992; Torre 2019) – young adults who select into highly sex-segregated and sex-incongruent occupations differ in meaningful ways from young adults in highly sex-segregated and sex-congruent occupations. In fact, there is evidence here that heterosocial histories lead to lower odds of selecting into sex-segregated occupations among young adults in sex-incongruent occupations, a supposition I explore in more detail with H_2.

Table 2. Random intercept logit models regressing occupational segregation on membership in the "heterosocial adolescent" group

	Model I	Model II	Model III	Model IV	Model V
Observations (*N*)	1910	1910	1910	1910	1910
Individual Respondents (*n*)	783	783	783	783	783
Intercept	2.07***	2.26***	2.15	1.85***	1.91***
	(0.30)	(0.31)	(0.31)	(0.31)	(0.31)
Focal Variables					
Heterosocial Adolescent	0.27	0.32	0.68**	0.59*	0.37
	(0.20)	(0.21)	(0.24)	(0.24)	(0.32)
Female	0.33	0.23	0.22	0.85***	0.69*
	(0.20)	(0.20)	(0.20)	(0.24)	(0.28)
Sex Incongruent Occupation	-	-0.65***	-0.21	0.55	0.56*
		(0.18)	(0.24)	(0.28)	(0.29)
Interaction Terms					
Heterosocial Adolescent×Sex Incongruent Occupation	-	-	-1.04**	-0.79*	-0.76*
			(0.36)	(0.37)	(0.37)
Female×Sex Incongruent Occupation	-	-	-	-1.96***	-2.00***
				(0.37)	(0.38)
Female×Heterosocial Adolescent	-	-	-	-	0.43
					(0.41)
Respondent Characteristics					
Hispanic/Latino	0.02	0.01	0.00	0.09	0.09
	(0.20)	(0.21)	(0.21)	(0.21)	(0.20)
High School Diploma or GED	0.14	0.18	0.17	0.11	0.10
	(0.22)	(0.22)	(0.22)	(0.22)	(0.22)
Income in 10,000s	-0.04	-0.04	-0.04	-0.04	-0.04
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Parent	0.00	0.01	0.01	0.01	0.02
	(0.21)	(0.21)	(0.21)	(0.21)	(0.21)
Married	-0.09	-0.09	-0.09	-0.08	-0.08
	(0.22)	(0.22)	(0.22)	(0.22)	(0.22)
Second Job	-0.11	-0.08	-0.08	-0.06	-0.06
	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)
Fit Statistics					
BIC	1668.439	1663.194	1662.584	1641.877	1648.346
Log Likelihood	-796.4454	-790.0451	-785.9631	-771.8318	-771.2889

*p≤0.05; **p≤0.01; ***p≤0.001
Standard errors in parentheses

Among young adults in sex-congruent occupations, heterosociality in adolescence increases the likelihood of selection into a sex-segregated occupation. These results imply the gender definitions and beliefs learned in adolescents' mixed-sex peer groups influence career decisions well into young adulthood, and that adolescents' mixed-sex peer groups are organized in favor of propagating and maintaining sex segregated divisions of human capital development. In Model IV, the model with the lowest BIC value, heterosocial histories predict an 80% increase in the odds of selecting into a sex-segregated occupation among women who do not work in sex-incongruent occupations (holding all other covariates constant). The effect is larger for men, and this model estimates heterosocial histories are associated with a 107% increase increase in the odds of selecting into a sex-segregated occupation among men who do not work in sex-incongruent occupations. With regards to the interaction term, women who have heterosocial histories and report working in sex-incongruent occupations see an 86% decrease in their odds of selecting into a sex-segregated occupation. For similarly situated men this effect is a bit smaller. They see a 64% decrease in their odds of selecting into a sex-segregated occuapation. While sex-differences in the effect of heterosocial histories are calculable, Model V results indicate differences in the influence of heterosocial histories on occupational selection are not statistically significant.

Other notable results include differences in how respondent sex predicts occupational segregation among these two groups. Among young adults in sex-congruent occupations, women have higher odds of working in occupations characterized by a high degree of sex-segregation. This finding suggests women are more likely than are men to select into same-sex segregated working environments at the outset of their working lives. Among young adults in sex-incongruent occupations, however, this inverse is true: women in sex-incongruent occupations

have lower odds of working in highly segregated spaces than do men in sex-incongruent spaces. Notably while it appears marital status exerts little to no effect on selecting into a sex-segregated occupation, supplementary analyses[5] indicate married women, specifically, are less likely to select occupations characterized by a high degree of sex segregation.

Heterosociality and Sex-Congruent Occupations

H_2, *adolescents in the predominantly heterosocial group are more likely to work in sex-incongruent occupations as young adults*, is supported. Results from Models I and II show adolescents in the predominantly heterosocial group are more likely to work in sex-incongruent occupations as young adults. The magnitude of this effect, however, is larger in Model II, where the interaction between adolescent heterosociality and sex segregation (*heterosocial adolescent×segregated workplace*) is accounted for. By interacting these variables, I account for the fact that while some young people will select into sex-incongruent occupations, many of them will encounter barriers to entry into sex-incongruent occupations where they are greatly outnumbered by the other sex. In Model I, where this interaction is not included, we can see heterosocial adolescents have higher odds of working in sex-incongruent occupations than do homosocial adolescents, and young people who work in occupations characterized by a high degree of sex segregation have lower odds of working in sex-incongruent occupations. These findings align with models testing H_1: sex-incongruent occupationers do not tend to work in highly sex-segregated spaces.

[5] See Table B in Appendices

Inclusion of an interaction term for adolescent heterosociality and sex segregation in Model II adds nuance to these findings. Consistent with Model I, the interaction term coefficient indicates heterosocial adolescents in highly sex-segregated occupations still have lower odds of working in spaces nominally dominated by other-sex coworkers. However, heterosocial adolescents in sex-integrated occupations are far more likely to work in sex-incongruent occupations. Crafting our baseline respondent from the models presented here, heterosocial histories increase the odds of working in a sex-incongruent occupation by 309% among women who have a high school diploma or GED. For similarly-situated women in highly sex-segregated

Table 3. Logit models regressing sex-incongruent occupations on adolescent heterosociality

	Model I	Model II	Model III
Observations (*N*)	1910	1910	1910
Individual Respondents (*n*)	783	783	783
Intercept	-0.89* (0.35)	1.26*** (0.38)	-1.32*** (0.39)
Focal Variables			
Heterosocial Adolescent	0.53* (0.22)	1.41*** (0.41)	1.55*** (0.46)
Segregated Workplace	-0.73*** (0.20)	-0.28 (0.27)	-0.28 (0.27)
Female	-1.45*** (0.23)	-1.44*** (0.23)	-1.31*** (0.30)
Interaction Term			
Heterosocial Adolescent×Segregated Workplace	-	-1.08** (0.42)	-1.07** (0.42)
Female×Heterosocial Adolescent	-	-	-0.29 (0.44)
Respondent Characteristics			
Hispanic/Latino	-0.07 (0.22)	-0.06 (0.22)	-0.05 (0.22)
High School Diploma or GED	0.50* (0.24)	0.50* (0.24)	0.50* (0.23)
Income in 10,000s	-0.06 (0.07)	-0.06 (0.07)	-0.06 (0.07)
Parent	-0.04 (0.21)	-0.05 (0.21)	-0.05 (0.20)
Married	-0.04 (0.23)	-0.03 (0.23)	-0.03 (0.23)
Second Job	0.32* (0.16)	0.30* (0.16)	0.30 (0.16)
Fit Statistics			
BIC	2041.049	2041.922	2049.043
Log Likelihood	-978.973	-975.6317	-975.4148

*p≤0.05; **p≤0.01; ***p≤0.001
Standard errors in parentheses

occupations, however, heterosocial histories decrease the odds of working in sex-incongruent occupations by 66%. These findings support assertions that adolescents' mixed-sex peer groups condition people to succeed in gender-integrated spaces, though H_1 and Model II results suggest this conditioning either does not prepare people to enter occupations where they are substantially outnumbered by other-sex coworkers, and/or does not reduce the impact of discriminatory hiring practices on selection into highly-segregated, sex-incongruent occupations.

As with H_1 tests, the coefficients for *female* are significant, but Model III coefficients for *heterosocial adolescent*×*female* are not. I interpret this to mean women in this sample have lower odds of working in sex-incongruent occupations than men, but the influence of heterosocial histories on selecting sex-incongruent occupations does not differ by sex.

Discussion

Results support a relationship between the sex composition of adolescent peer groups and young adults' early career decisions. Among young adults in sex-congruent occupations, heterosociality in adolescence substantially increases the odds of working in spaces characterized by a high degree of sex segregation. Further, while heterosociality in adolescence increases the odds of selection into a sex-incongruent occupation, it only does so in cases where sex-incongruent occupations are not characterized by high degrees of sex-segregation. The DYS sample of young, early-career adults from low-socioeconomic status neighborhoods allows me to speak specifically to a population underserved by literature on occupational segregation and selection, and my results support the core argument that the sex composition of adolescent peer groups is an important predictor of individuals' occupational outcomes. While these results are striking, my inability to control for the socio-structural contexts in which DYS respondents are embedded gives way to two major limitations of this study. First, I cannot fully account for

institutional correlates of mixed-sex peer grouping and interaction, such as extracurricular access, within-school sex segregation, or family structure and gender beliefs. Second, these models do not control for demand-side factors – such as hiring discrimination and androcentric workplace policies – that have been found to push and pull people into sex segregated and sex-congruent occupations. These limitations shape my interpretation of results in important ways, and I elaborate, below:

H_1, *adolescents in the predominantly heterosocial group are more likely to work in occupations characterized by a high degree of sex segregation as young adults*, is supported. However it is important to clarify for whom these results are most telling and why. DYS respondents included in this research generally attended low-income school districts as adolescents, which means structured opportunities for mixed-sex interaction may have been sparse. In particular, low-income school districts are often forced to limit extracurricular offerings, and sex segregated extracurriculars such as sports are often prioritized above more sex-integrated options such as the arts (Snellman, Silva, and Putnam 2015). Subsequently, the structure of adolescents' school contexts – including the extent to which school environments segregate students by sex – have important implications for how gender beliefs are learned in mixed- and same-sex peer groups. Faris and Felmlee, for instance find cross-sex friendships decrease antisocial behavior in schools with low levels of informal sex segregation where mixed-sex peer groups are common and structural barriers to such relationships are limited (2011). However, the same study finds other-sex peers increase antisocial behavior in schools with high levels of informal gender segregation where such friendships are scarce. These findings indicate the meaning of other-sex friendships varies per the social structures within which they are embedded, and that structural changes – such as increasing or decreasing levels of informal

gender segregation – can generate substantial variation in regards to the value and function of mixed-sex peer groups.

Taking into account Ridgeway and Correll's assertion that gender beliefs are especially salient in mixed-sex contexts (2004), H_1 results suggest the gender beliefs learned in mixed-sex peer groups in adolescence lead people to develop preferences and confidences in concert with hegemonic gender beliefs. Specifically, adolescents who spend most of their peer-to-peer time among other-sex peers may learn and internalize the belief that men and women possess divergent, and naturally occurring predilections for types of labor. Importantly, this belief can be internalized even among those whose mixed-sex peer groups serve the special function of allowing them to practice gender-atypical skills and interactions (Monsour 2002; Swain 1992). I therefore interpret my findings to mean adolescents in mixed-sex peer groups are exposed to both hegemonic gender beliefs and opportunities for skill diversification more frequently than are adolescents in same-sex peer groups. Heterosocial adolescents who wish to enter sex-congruent work in highly sex-segregated fields will find themselves rewarded by the gendered structure of the labor market in that their short-term pathways to occupational success are less vulnerable to hiring bias or androcentric workplace policies. Heterosocial adolescents whose time spent in mixed-sex peer groups left them with gender-atypical preferences and skillsets, however, are more likely to encounter demand-side barriers to entry into highly sex-segregated occupations than in sex-integrated occupations (Torre 2019). As a result, the influence of heterosocial histories on securing employment in a sex-incongruent, highly segregated occupation is eclipsed by the power of a discriminatory labor market. In order to test this assertion, future researchers are encouraged to examine how adolescents' career aspirations, skills, and skill confidence vary per the sex composition of their adolescent peer groups, and

whether controlling for these variations attenuates the influence of mixed-sex peer groups on young adult occupational outcomes. Further, it is possible formerly heterosocial young adults – especially women – are more likely to encounter hiring discrimination and bias early in their careers. The DYS data does not allow me to account for these realities.

If one takes only H_1 results into account, it would appear heterosocial histories are tied more so to the learning of hegemonic gender beliefs than to the accrual of gender-atypical skills, behaviors, and preferences. H_2 results, however, complicate this picture. The supposition that *heterosocial adolescents are more likely to work in sex-incongruent occupations as young adults than are homosocial adolescents* is wholly supported net of entering into a sex segregated occupation and other potential confounders. This finding aligns with the argument that mixed-sex peer groups, more so than same-sex peer groups, expose adolescents to alternative gender beliefs as they relate to skill-building, and that this exposure subsequently primes adolescents to enter sex-incongruent occupations in young adulthood. Again, it is important to keep in mind the DYS respondents are early in their careers and from low-socioeconomic backgrounds. Therefore, men in particular may be considerably more likely to work in sex-incongruent occupations during this particular point in the life course than are women. For example, approximately 16% of all men working in sex-incongruent occupations work in "food counter, fountain, and related occupations". These "McJobs" (Etzioni 1986) are often considered starter, or temporary work, especially among young people, and are characterized by high turnover rates, low hourly wages, and undesirable working conditions. While both men and women often enter such occupations under the pretense that they are temporary, women are more likely to be targeted for recruitment and retention efforts by these types of employers (Lindsay and McQuaid 2004), and men may be more successful in finding more desirable work given structural barriers encountered by women

in the labor force. Therefore, it is possible that a good portion of DYS men in sex-incongruent occupations are there only temporarily, and that the results of these analyses would be quite different were we able to follow respondents into their middle adulthood and beyond. Still, the influence of heterosocial histories remains strong, net of these potential confounders.

Conclusions

This research sheds light on an understudied, supply-side sorting mechanism behind occupational selection. Social relational contexts are important, and argue some of this variation in the internalization of gendered beliefs is linked to the sex composition of peer groups across the life course, particularly during adolescence. During adolescence, variation in the sex-composition of peer groups increases, with some peer groups becoming more sex- and gender-integrated than others. Subsequently, there is between-group variation in exposure to hegemonic and alternative gender beliefs. This variation helps explain selection into occupations characterized by a high degree of sex-segregation, and sex-incongruent occupations. It would appear that while mixed-sex peer groups may allow adolescents to practice some gender atypical skills that can serve them in sex-incongruent occupations in young adulthood, they also reinforce the hegemonic gender beliefs that help sort men and women into highly segregated occupational fields.

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APPENDICES

Chapter 2 and 3 Trajectory Models

Group-Based Trajectory Model: Probability of Reporting a Mixed-Sex Peer Group in Adolescence

	Model I	Model II
Observations (*N*)	5211	5211
Individual Respondents (*n*)	1468	1468
Group 1		
Respondent Membership	58.42%	58.53%
Intercept	-4.35*** (0.47)	-3.93*** (0.57)
Linear Coefficient	0.22*** (0.03)	0.16*** (0.04)
Romantic Activity	-	0.74*** (0.13)
Sexual Activity	-	-0.09 (0.15)
Drug Use	-	0.47** (0.15)
Property Crime	-	-0.21 (0.12)
Violent Crime	-	0.35** (0.13)
Group 2		
Respondent Membership	41.58%	41.47%
Intercept	25.04 (17.79)	9.80 (18.32)
Linear Coefficient	-6.52 (4.07)	-2.94 (4.19)
Quadratic Coefficient	0.54 (0.31)	0.26 (0.31)
Cubic Coefficient	-0.01 (0.01)	-0.01 (0.01)
Romantic Activity	-	0.37** (0.14)
Sexual Activity	-	0.30 (0.21)
Drug Use	-	0.60* (0.27)
Property Crime	-	-0.34* (0.14)
Violent Crime	-	0.39 (0.20)
Fit Statistics		
BIC(*N*)	-3290.69	-3272.86
BIC(*n*)	-3286.25	-3262.09
Posterior Probabilities Between 0.4 and 0.6	10.15%	10.76%

*p≤0.05; **p≤0.01; ***p≤0.001

Table A. Occupational Categories

Table A. Occupational Categories in the DYS Sample

1990 Occupational Title	$\frac{male}{female}$ ratio
Accountants and auditors	0.90
Actors and directors	1.62
Administrators, education and related fields	0.90
Advertising and related sales occupations	0.93
Animal caretakers, except farm	0.60
Architects	5.63
Assemblers	1.31
Attendants, amusement and recreational facilities	1.69
Automobile body and related repairers	47.47
Automobile mechanics, except apprentices	53.10
Baggage porters and bellhops	8.22
Bank tellers	0.11
Barbers	3.71
Bartenders	1.01
Bill and account collectors	0.51
Billing clerks	0.10
Biological and life scientists	1.40
Bookbinders	0.87
Bookkeepers, accounting, and auditing clerks	0.12
Brickmasons and stonemasons, except apprentices	79.09
Bus drivers	1.08
Business, commerce, and marketing teachers	0.82
Butchers and meat cutters	4.09
Cabinet makers and bench carpenters	14.56
Carpenters, except apprentices	57.74
Carpet installers	45.40
Cashiers	0.26
Child care workers	0.12
Child care workers, private household	0.03
Computer programmers	2.07
Concrete and terrazzo finishers	74.87
Construction laborers	23.83
Constructions trades, n.e.c.	31.02
Cooks	1.10
Counselors, educational and vocational	0.62
Dancers	0.30
Data-entry keyers	0.15
Demonstrators, promoters, and models, sales	0.22
Dental laboratory and medical appliance technicians	1.52
Designers	0.80
Dispatchers	0.90
Drywall installers	38.69
Editors and reporters	0.97
Electrical power installers and repairers	70.18

Electrician apprentices	21.77
Electricians, except apprentices	39.55
Engineers, n.e.c.	9.23
Engineers: aerospace	11.31
Farm workers	4.05
File clerks	0.24
Financial managers	1.05
Firefighting occupations	36.47
Food counter, fountain, and related occupations‡	0.38
Freight, stock, and material handlers	3.43
Furniture and wood finishers	2.98
Garbage collectors	22.94
General office clerks	0.21
Groundskeeper and gardeners, except farm	12.44
Guards and police, except public servants	5.02
Guides	0.88
Hairdressers and cosmetologists	0.12
Hand packer and packagers	0.55
Health aides, except nursing	0.25
Health technologists and technicians, n.e.c.	0.41
Heating, air conditioning, and refrigeration mechanics	74.06
Helpers, mechanics, and repairers	16.38
Hotel clerks	0.39
Household appliance and power tool repairers	23.26
Information clerks, interviewers	0.32
Inspectors and compliance officers, except construction	2.28
Insurance adjusters, examiners and investigators	0.41
Janitors and cleaners	2.18
Kitchen workers, food preparation‡	0.33
Launderers and ironers	0.21
Lawyers	3.10
Legal assistants	0.32
Machinery maintenance occupations	21.31
Machinists, except apprentices	20.96
Maids and housemen	0.24
Mail carriers, postal service	2.73
Mail clerks, except postal service	1.00
Management related occupations, n.e.c.	0.29
Managers, food serving and lodging establishments‡	1.25
Managers, marketing, advertising, and public relations	2.14
Managers, properties and real estate	1.17
Managers, service organizations, n.e.c.	0.99
Messengers	3.04
Military careers	13.28
Miscellaneous food preparation occupations‡	1.01
Miscellaneous material moving equipment operators	6.44
Miscellaneous precision woodworkers	5.77
Miscellaneous precision workers, n.e.c.	5.13

Miscellaneous printing machine operators	0.85
Musicians and composers	2.04
News vendors	1.56
Nursing aides, orderlies, and attendants	0.15
Operations and systems researchers and analysts	1.35
Painters, construction and maintenance	11.90
Parking lot attendants	8.73
Personnel, training and labor relations specialists	0.73
Pharmacists	8.73
Photographic process machine operators	0.93
Physical education teachers	0.98
Physical therapists	0.32
Plumbers, pipefitters, and steamfitters, apprentices	42.00
Plumbers, pipefitters, and steamfitters, except apprentices	66.72
Postal clerks, except mail carriers	1.00
Production coordinators	1.12
Protective service occupations, n.e.c.	1.19
Punching and stamping press operators	2.55
Purchasing agents and buyers, n.e.c.	1.21
Radiologic technicians	0.38
Real estate occupations	0.98
Receptionists	0.04
Records clerks	0.27
Registered nurses	0.06
Roofers	62.92
Sales support occupations, n.e.c.	0.95
Sales workers, apparel†	0.23
Sales workers, hardware and building materials†	1.21
Sales workers, motor vehicles and boats†	8.43
Sales workers, other commodities†	0.51
Sales workers, radio, TV, hi-fi, and appliances†	2.50
Sales workers, shoes†	0.61
Science technicians, n.e.c.	2.05
Secretaries	0.01
Securities and financial services sales occupations	2.60
Sheet metal workers, except apprentices	16.80
Sheet metal duct installers	70.17
Stock and inventory clerks	0.05
Supervisors and proprietors, sales occupations, salaried	1.87
Supervisors, administrative support occupations	0.78
Supervisors, construction n.e.c.	34.38
Supervisors, food preparation and service occupations‡	0.74
Supervisors, production occupations	4.64
Taxicab drivers and chauffeurs	8.23
Teachers, elementary school	0.27
Teachers, except postsecondary	0.34
Teachers, n.e.c.	0.61
Teachers' aides	0.12

Technicians, n.e.c.	2.41
Telemarketers	0.56
Telephone operators	0.14
Tile setters, hard and soft	42.27
Traffic, shipping, and receiving clerks	2.45
Transportation ticket and reservation agents	0.42
Truck drivers	15.59
Upholsterers	3.41
Ushers	2.03
Vehicle washers and equipment cleaners	7.08
Waiters/waitresses‡	0.24
Waiters/waitresses assistants‡	1.35
Welders and cutters	20.20

n.e.c. = not elsewhere classified
†retail industry
‡food service industry

Table B. Sex-Interacted Models of Occupational Segregation

Table B. Logit models regressing occupational segregation on heterosocial adolescent group membership

	Model I		Model I	
Observations (*N*)	1910		1910	
Individual Respondents (*n*)	783		783	
	Logit Coefficient	Odds Ratio	Logit Coefficient	Odds Ratio
Intercept	2.31*** (0.32)	10.06	1.87*** (0.38)	6.51
Focal Variables				
Heterosocial Adolescent	0.18 (0.29)	1.20	0.07 (0.29)	1.07
Female	0.12 (0.26)	1.12	1.05 (0.57)	2.86
Sex Incongruent Occupation	-0.65*** (0.18)	0.52	0.23 (0.25)	1.26
Respondent Characteristics				
Hispanic/Latino	0.01 (0.21)	1.01	-0.16 (0.28)	0.85
High School Diploma or GED	0.18 (0.22)	1.20	0.27 (0.29)	1.30
Income in 10,000s	-0.04 (0.06)	0.96	0.00 (0.09)	1.00
Parent	0.01 (0.21)	1.01	0.22 (0.31)	1.24
Married	-0.09 (0.22)	0.91	0.46 (0.35)	1.58
Work and Workplace Characteristics				
Second Job	-0.07 (0.17)	0.93	-0.20 (0.23)	0.82
Female Interaction Terms				
Female×Heterosocial Adolescent	0.28 (0.41)	1.32	0.55 (0.41)	1.74
Female×Sex Incongruent Occupation	-	-	-2.12*** (0.37)	0.12
Female×Hispanic/Latino	-	-	0.57 (0.42)	1.76
Female×High School Diploma or GED	-	-	-0.40 (0.46)	0.67
Female×Income in 10,000s	-	-	-0.08 (0.12)	0.92
Female×Parent	-	-	-0.41 (0.43)	0.66
Female×Married	-	-	-1.01* (0.46)	0.36
Female×Second Job	-	-	0.34 (0.34)	1.41
Fit Statistics				
BIC	1670.275		1679.539	
Log Likelihood	-789.8085		-767.9982	

*p≤0.05; **p≤0.01; ***p≤0.001
Standard errors in parentheses

Chapter 3's Excluded Unemployed

Given the scope of this paper and the structure of the DYS, unemployed adults are excluded from analyses. While elimination of these observations cannot be avoided, their absence does have implications regarding the generalizability of my results. Given the age of my sample, reasons for unemployment may vary. Some young adults are unemployed because they are attending school full time, others may be unemployed despite actively searching for work, and still others may have experienced interruptions in their occupational trajectories due to childbirth, incarceration, or illness. I discuss results from analyses conducted to obtain a fuller accounting of how such factors may influence interpretation of results, below.

Unemployment rates were low and decreasing during the survey periods represented in this sample (U.S. Bureau of Labor Statistics 2020), which somewhat attenuates the number of respondents missing due to inability to find work. However, even during periods of economic growth women, BIPOC, less-educated people, and poor people are at higher risk of unemployment. Given these demographics are disproportionately represented in the DYS, their exclusion from analyses shapes implicatory discussion in important ways. In total, I lose 411 person-year observations (from 239 respondents) due to respondent unemployment. In regards to the focus of this dissertation, t-tests for significant differences in the mean indicate the excluded unemployed do not differ significantly from the sample used in analyses with regard to the sex composition of adolescent peer groups. However, as predicted in prior literatures on characteristics of the unemployed, the excluded unemployed are significantly more likely to be female, Hispanic or Latino, lack a high school diploma or GED, and low-income. In addition, unemployed persons are less likely to be married and more likely to be parents. T-test results are displayed, below:

```
. ttest female if unemp_ch3==1, by(unemployed)
```

```
Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |    1938    .5082559    .0113592    .5000609    .4859785    .5305334
       1 |     411    .6861314    .0229185    .4646293     .641079    .7311838
---------+--------------------------------------------------------------------
combined |    2349    .5393785    .0102866    .4985531    .5192068    .5595501
---------+--------------------------------------------------------------------
    diff |           -.1778755    .0268299               -.2304882   -.1252627
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -6.6298
Ho: diff = 0                                     degrees of freedom =     2347

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 1.0000

. ttest hisp_lat if unemp_ch3==1, by(unemployed)

Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |    1938    .4767802    .0113484    .4995895    .4545237    .4990366
       1 |     411     .540146    .0246135    .4989931    .4917616    .5885304
---------+--------------------------------------------------------------------
combined |    2349    .4878672    .0103156    .4999592    .4676386    .5080957
---------+--------------------------------------------------------------------
    diff |           -.0633658    .0271248               -.1165569   -.0101747
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -2.3361
Ho: diff = 0                                     degrees of freedom =     2347

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0098         Pr(|T| > |t|) = 0.0196          Pr(T > t) = 0.9902

. ttest hs_graduate if unemp_ch3==1, by(unemployed)

Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |    1938    .7662539     .009616    .4233218    .7473951    .7851126
       1 |     411    .5352798    .0246317    .4993616    .4868596       .5837
---------+--------------------------------------------------------------------
combined |    2349    .7258408     .009206    .4461846     .707788    .7438936
---------+--------------------------------------------------------------------
    diff |            .2309741    .0237618                .1843777    .2775705
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =   9.7204
Ho: diff = 0                                     degrees of freedom =     2347

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000

. ttest income_10000 if unemp_ch3==1, by(unemployed)

Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |    1938    1.973158    .0371018     1.63332    1.900395    2.045922
       1 |     411    1.424111     .050462    1.023023    1.324914    1.523307
---------+--------------------------------------------------------------------
combined |    2349    1.877092    .0321439      1.5579    1.814059    1.940126
---------+--------------------------------------------------------------------
    diff |            .5490474    .0838582                .3846036    .7134912
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =   6.5473
Ho: diff = 0                                     degrees of freedom =     2347
```

```
    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 1.0000         Pr(|T| > |t|) = 0.0000          Pr(T > t) = 0.0000

. ttest parent if unemp_ch3==1, by(unemployed)

Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |    1938    .1795666    .0087211    .3839251    .1624629    .1966702
       1 |     411    .2530414     .021471    .4352843    .2108344    .2952483
---------+--------------------------------------------------------------------
combined |    2349    .1924223    .0081352    .3942869    .1764693    .2083753
---------+--------------------------------------------------------------------
    diff |           -.0734748    .0213627               -.1153666    -.031583
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =  -3.4394
Ho: diff = 0                                     degrees of freedom =     2347

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.0003         Pr(|T| > |t|) = 0.0006          Pr(T > t) = 0.9997

. ttest married if unemp_ch3==1, by(unemployed)

Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
       0 |    1938    .2239422    .0094722    .4169914    .2053655     .242519
       1 |     411    .1849148    .0191732    .3887016    .1472247     .222605
---------+--------------------------------------------------------------------
combined |    2349    .2171137    .0085083    .4123684    .2004291    .2337983
---------+--------------------------------------------------------------------
    diff |            .0390274    .0223841               -.0048674    .0829221
------------------------------------------------------------------------------
    diff = mean(0) - mean(1)                                      t =   1.7435
Ho: diff = 0                                     degrees of freedom =     2347

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.9593         Pr(|T| > |t|) = 0.0814          Pr(T > t) = 0.0407
```

Some of these differences are substantial, and all have important implications for how results are interpreted. Although women are considerably more likely among both employed and unemployed young adults in the DYS to be married and to have children, logit models regressing unemployment on respondent sex indicate parental status, possession of high school degree or GED, and income are all significantly associated with employment net of respondent sex. Martial status and ethnicity, however, are not. These results are displayed, below:

```
. xtlogit unemployed female hisp_lat parent married ///
> hs_graduate income_1000 if unemp_ch3==1, or
Random-effects logistic regression              Number of obs      =      2349
Group variable: seqid                           Number of groups   =       855

Random effects u_i ~ Gaussian                   Obs per group: min =         1
                                                               avg =       2.7
                                                               max =         5
```

```
Integration method: mvaghermite                 Integration points =        12

                                                Wald chi2(6)       =     71.34
Log likelihood  = -907.05639                    Prob > chi2        =    0.0000

------------------------------------------------------------------------------
  unemployed |         OR   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      female |   2.690945   .6242261     4.27   0.000     1.707848    4.239947
    hisp_lat |   .8411712   .1969498    -0.74   0.460     .5316013    1.331014
      parent |   1.618487   .3171686     2.46   0.014     1.102307     2.37638
     married |    .634225   .1664349    -1.74   0.083     .3792005    1.060762
 hs_graduate |   .3382006   .0787911    -4.65   0.000     .2142242    .5339248
income_10000 |    .642756    .075422    -3.77   0.000     .5106987    .8089609
       _cons |   .2008513   .0667143    -4.83   0.000      .104747    .3851304
-------------+----------------------------------------------------------------
    /lnsig2u |   1.429817   .1759424                      1.084976    1.774658
-------------+----------------------------------------------------------------
     sigma_u |      2.044   .1798131                      1.720282    2.428634
         rho |   .5594597   .0433636                      .4735569    .6419437
------------------------------------------------------------------------------
Likelihood-ratio test of rho=0: chibar2(01) =   186.40 Prob >= chibar2 = 0.000
```

Literature on supply-side dynamics and job-seeking behaviors consistently argue women, especially married women, are more likely to "opt out" of the labor market (Heckman and Willis 1977; Killingsworth and Heckman 1986) than are men. However, t-tests for differences in job-seeking behaviors among the unemployed – i.e. whether or not unemployed respondents report having sought work without success in the past year – show no significant differences between men and women in terms of active job seeking.

```
. ttest employment_search if unemp_ch3==1 & unemployed==1, by(female)

Two-sample t test with equal variances
------------------------------------------------------------------------------
   Group |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
      no |     129    .2015504    .0354577    .4027221    .1313913    .2717095
     yes |     282    .2446809    .0256456    .4306621    .1941991    .2951626
---------+--------------------------------------------------------------------
combined |     411    .2311436    .0208196    .4220778    .1902171      .27207
---------+--------------------------------------------------------------------
    diff |           -.0431305    .0448677               -.1313306    .0450697
------------------------------------------------------------------------------
    diff = mean(no) - mean(yes)                                   t =  -0.9613
Ho: diff = 0                                     degrees of freedom =      409

    Ha: diff < 0                 Ha: diff != 0                 Ha: diff > 0
 Pr(T < t) = 0.1685         Pr(|T| > |t|) = 0.3370          Pr(T > t) = 0.8315
```

This means the young, unemployed women in the DYS are no more likely than are unemployed men to have voluntarily declined participation in the labor force. This finding

undermines conventional arguments regarding sex differences in employment-seeking behaviors wherein women are assumed to select out of the labor force due to marital and family commitments (Heckman and Willis 1977; Killingsworth and Heckman 1986), as well as human capital arguments regarding occupational segregation that would have women seeking feminized occupations for the same or similar reasons (Becker 1985). Subsequently, these results support the presence of a structural, demand-side mechanism that systematically excludes young women from the labor force, in line with literature on hiring discrimination and other forms of sexism (England 1982; England et al. 1988; Okamoto and England 1999).

In addition to the analyze described above, I also ran the models included in his paper with a variable capturing *recent unemployment*. This variable captured whether respondents reported having been unemployed in the year prior the current survey period, or if they report recent difficulties in securing employment. Respondents are categorized as "1" for *recently unemployed* if they report having no job in the prior wave, or if they report having looked for work without success any time within the past year. This variable takes a value of "0" if respondents were employed in the prior wave and do not report any difficulties in finding employment within the past year. Though the sample size decreased from 1,910 observations to 1,679 observations due to non-responses on questions used to generate this measure, the substantive results displayed in this manuscript were largely unchanged. Further, recent unemployment was not a significant predictor of occupational segregation in supplementary analyses. I ultimately chose not to include this variable in my final analyses in favor of a larger sample size and more parsimonious model.

```
. xtlogit segregated group1 outnumbered outnumberedXgroup1 ///
> female hisp_lat parent married ///
> hs_graduate income_10000 ///
> second_job retail food_service ///
> recent_unemp ///
> if ch3==1, or
Random-effects logistic regression              Number of obs      =      1679
```

```
Group variable: seqid                           Number of groups   =       741

Random effects u_i ~ Gaussian                   Obs per group: min =         1
                                                               avg =       2.3
                                                               max =         5

Integration method: mvaghermite                 Integration points =        12

                                                Wald chi2(13)      =     43.30
Log likelihood  = -690.36118                    Prob > chi2        =    0.0000
```

segregated	OR	Std. Err.	z	P>|z|	[95% Conf.	Interval]
group1	.4990695	.1316133	-2.64	0.008	.2976353	.8368308
outnumbered	.2322581	.0707186	-4.79	0.000	.1278777	.4218393
outnumberedXgroup1	3.478566	1.391891	3.12	0.002	1.587837	7.620696
female	1.213025	.265969	0.88	0.378	.7892866	1.864254
hisp_lat	1.023902	.2268564	0.11	0.915	.663232	1.580706
parent	1.131275	.2657454	0.53	0.600	.7138623	1.79276
married	.877129	.2160455	-0.53	0.595	.5412578	1.421421
hs_graduate	1.204801	.3003169	0.75	0.455	.7391605	1.963774
income_10000	.9622408	.0606968	-0.61	0.542	.8503371	1.088871
second_job	.8380922	.1549933	-0.96	0.340	.583276	1.20423
retail	6.337077	3.151582	3.71	0.000	2.390924	16.79624
food_service	2.34309	.8023201	2.49	0.013	1.197625	4.584132
recent_unemployment	1.108469	.2390876	0.48	0.633	.7263169	1.691689
_cons	14.29934	5.599922	6.79	0.000	6.636934	30.80806
/lnsig2u	.9413476	.2384772			.4739409	1.408754
sigma_u	1.601073	.1909097			1.267404	2.022587
rho	.4379466	.058701			.3280745	.5542622

```
Likelihood-ratio test of rho=0: chibar2(01) =    61.00 Prob >= chibar2 = 0.000
```