

Differences in Offending among Bisexual and Heterosexual Youth:  
The Influence of Maternal Support and Running Away from Home

by

Andre Mansion

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Graduate Supervisory Committee:

Laurie Chassin, Chair  
Manuel Barrera  
Kevin J. Grimm  
Russell B. Toomey

ARIZONA STATE UNIVERSITY

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## ABSTRACT

Research has consistently shown that gay/lesbian/bisexual (GLB) or sexual minority youth are at an increased risk for adverse outcomes resulting from the stress caused by continual exposure to negative events (e.g., victimization, discrimination). The present study used a nationally representative sample of adolescents to test mechanisms that may be responsible for the differences in offending behaviors among sexual minority and heterosexual adolescents. Specifically, this study tested whether bisexual adolescents received less maternal support than did heterosexual adolescents because of their sexual orientation, thus increasing the likelihood that they run away from home. This study then examined whether the greater likelihood that bisexual adolescents running away would lead to them committing a significantly higher variety of income-based offenses, but not a significantly higher variety of aggression-based offenses. This study tested the hypothesized mediation model using two separate indicators of sexual orientation measured at two different time points, modeled outcomes in two ways, as well as estimated the models separately for boys and girls. Structural equation modeling was used to test the hypothesized direct and indirect relations. Results showed support for maternal support and running away mediating the relations between sexual orientation and offending behaviors for the model predicting the likelihood of committing either an aggressive or an income offense, but only for girls who identified as bisexual in early adulthood. Results did not support these relations for the other models, suggesting that bisexual females have unique needs when it comes to prevention and intervention. Results also highlight the need for a greater understanding of sexual orientation measurement methodology.

## DEDICATION

I dedicate this to my family and friends who never stopped believing in my ability to succeed  
in this monumental endeavor.

To my parents: You are the most amazing, wonderful, and generous people. Thank you for  
instilling in me the confidence to follow my dreams. Your unconditional love and support  
made all of this possible.

To my best friend and brother Travis Shumake: Words cannot express the amount of love,  
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## INTRODUCTION

### Overview

Adolescence is a time in which the risk of experiencing negative outcomes, such as substance use problems and delinquency, increases significantly. Over the past 30 years, research on gay, lesbian, and bisexual (GLB or sexual minority) youth, has consistently shown that these adolescents are at a greater risk for experiencing adverse outcomes in adolescence than are heterosexual adolescents (see, e.g., Marshal et al., 2011). These differences may be the result of GLB youth having to contend with a hostile, heteronormative social and political environment that stigmatizes and discriminates against them based solely on their sexual orientation (Meyer, 2003). The result of continuously experiencing incidents of stigmatization and discrimination is called "minority stress," and sexual minorities are just one of many groups that experience it (Durkheim, 1951; Meyer, 1995; Moss, 1973). According to minority stress theory, an individual's continual exposure to adverse events causes him/her to experience higher levels of physiological and psychological stress, which in turn significantly increases the risk that he/she will then experience negative, stress-related outcomes (Meyer, 2003).

One adverse outcome that adolescents are at an increased risk for, regardless of sexual orientation, is offending. However, empirical research on delinquency in GLB youth is scarce, as most studies looking at negative outcomes in GLB youth have focused on the increased prevalence of internalizing disorders, such as depressive symptomatology (see, e.g., Almeida, Johnson, Corliss, Molnar, & Azreal, 2009), substance use problems (see, e.g., Marshal et al., 2008), and suicidal ideation (see, e.g., D'Augelli, Hershberger, & Pilkington, 2001). Aside from risky sexual behaviors and substance use, few studies have explored the

negative externalizing behavioral outcomes of GLB adolescents (see, e.g., Williams, Connolly, Pepler, & Craig, 2005; Balsam, Rothblum, & Beauchaine, 2005). Even fewer have empirically tested the role that being GLB plays in juvenile offending (see, e.g., Garnette, Irvine, Reyes, & Wilber, 2011; Udry & Chantala, 2002), and none have empirically investigated the underlying mechanisms that may be responsible for differences in offending among GLB and heterosexual adolescents. The current study is based on minority stress theory and hypothesizes that, when compared to heterosexual adolescents, GLB adolescents elicit less supportive behaviors from their parents (who share society's negative beliefs about GLB persons), which then increases the likelihood that they run away from home, thus significantly increasing their risk for offending.

### **Explaining the Increased Prevalence of Adverse Outcomes during Adolescence**

Research has confirmed an age-related pattern in which many problems, such as substance use, mental health disorders, and criminal offending, manifest or peak during adolescence, and then significantly decrease in prevalence by mid-adulthood (Chen & Jacobson, 2012; Moffitt, 1993; Paus, Keshavan, & Giedd, 2008). There are characteristics specific to adolescence that are responsible for these observed age-related trends. At the individual level, the Dual-Systems Model theorizes that increased risk-taking behaviors in adolescence are due to the development of two complementary, yet distinct, brain systems occurring along different timetables (Steinberg, 2010; Strang, Chein, & Steinberg, 2013). During adolescence, there is a significant increase of the neurotransmitter dopamine within the socio-emotional system that increases an individual's inclination to seek rewards (Steinberg, 2010). The rise in dopaminergic activity and maturation of the socio-emotional system, which precedes the slower and more gradual maturation of the cognitive-control

system, which is responsible for self-regulation and impulse control, and does not fully develop until early adulthood (Steinberg, 2010). The difference in developmental timing of these systems causes an imbalance between reward-seeking and inhibitory behaviors, thus explaining the increase in risk-taking behaviors during adolescence (Steinberg, 2010).

The increased prevalence of adverse outcomes in adolescence has also been linked to social and interpersonal risk factors uniquely present at the family and peer level during adolescence (Agnew, 1991; Moffitt, 1993; Warr & Stafford, 1991). At this developmental stage, the desire to forge an identity separate from the family leads an adolescent to look increasingly towards his/her peers for guidance on attitudes and behaviors (Thornberry, Lizotte, Krohn, Farnsworth, & Jang, 1994). This attempt at independence from parents (i.e., decreasing parent and adolescent interactions and parental influence) coincides with increases in social roles and opportunities for peer-interaction (D'Augelli, Hershberger, & Pilkington, 1998; Larson, Richards, Moneta, Holmbeck, & Duckett, 1996; Moretti & Peled, 2004). This can result in an adolescent associating with deviant peers, who significantly increase the chances of engaging in the risky behaviors that lead to adverse outcomes (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2006; Steinberg & Monahan, 2007). Still, parental influence in many areas (e.g., support, involvement, monitoring, and discipline) remains a significant factor in mental health and behavioral outcomes (Allen, Porter, McFarland, Marsh, & McElhaney, 2007; Hair et al., 2005). For example, effective parental monitoring (i.e., knowing where your child is and what they are doing) is a protective factor that reduces the risk of an adolescent engaging in a variety of harmful behaviors, such as delinquency, substance use, and running away from home (Tyler & Bersani, 2008).

At the community-level, economic disadvantage and community crime can elicit or influence an adolescent's desire to engage in risky behaviors (Arthur, Hawkins, Pollard, Catalano, & Baglione, 2002; Reingle, Maldonado-Molina, Jennings, & Komro, 2012). For example, if the adolescent lives in a community where drugs and alcohol are easily obtainable, coupled with his/her increased ability to move freely and independently, substantially increases the likelihood that the adolescent engages in risky behaviors such as substance use (Arthur et al., 2002).

### **Sexual Orientation in Adolescence**

Sexual orientation can be described as an "enduring pattern of emotional, romantic, and sexual attractions to men, women, or both sexes" (American Psychological Association [APA], 2008). Sexual orientation is a combination of three components: sexual attraction, sexual behavior, and sexual identity (Matthews, Lorah, & Fenton, 2005). Sexual attraction refers to either a physiological sexual desire or an attachment-based romantic desire that a person holds for another individual (Wolff et al., 2016). On the other hand, sexual behavior refers to the gender of the person an individual chooses to engage in sexual activities with (Wolff et al., 2016). Finally, sexual identity refers to the label an individual uses to express his/her sexual preferences (e.g., "gay/lesbian," "bisexual," or "straight"; APA, 2008; Wolff, Wells, Ventura-DiPersia, Renson & Grove, 2016)<sup>1</sup>.

The development of a sexual orientation is said to be a defining characteristic of adolescence and is more salient during this time than in any other life stage (Brown, 2000; Katchadourian, 1990; Konopka 1973). For GLB individuals, the process of discovering one's

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<sup>1</sup> Several theories advocate for a continuum conceptualization of sexual orientation (see, e.g., Kinsey, Pomeroy, Martin, & Gebhard, 1953; Klein, 1993; Klein, Sepekoff, & Wolf, 1985; Shiveley & De Cecco, 1977). However, the categorical classification system was used in the current study.

sexual orientation tends to take place at or around the start of adolescence and is considered to be resolved after the occurrence of three events, corresponding with the three components that make up sexual orientation: (1) the awareness of same-sex attraction, (2) the first same-sex sexual encounter, and (3) the disclosure of one's sexual orientation to one or more persons (D'Augelli et al., 1998; Maguen, Floyd, Bakeman, Armistead, 2002; Rosario, Schrimshaw, & Hunter, 2009). Research over the last three decades has shown that, on average, awareness occurs around 10-11 years old, same-sex sexual contact occurs around 15-16 years old, and disclosure occurs around 15-17 years old (D'Augelli et al., 1998; Maguen et al., 2002; Rosario et al., 2009). These milestones coincide with other significant physical, psychological, and social changes specific to adolescence, making it an especially challenging period for GLB youth (APA, 2009).

### **GLB Adolescents are at Even Greater Risk for Adverse Outcomes**

Researchers studying GLB adolescent development have consistently reported prevalence rates of adverse outcomes that are much higher for GLB youth than they are for heterosexual youth (see, e.g., Bontempo & D'Augelli, 2002; Clements-Nolle, Marx, & Katz, 2006; Mays & Cochran, 2001; Meyer, 2003; Murdock & Bolch, 2005; Williams et al., 2005). One reason for this increase in risk relates to the chronicity of culturally-held negative views of GLB persons that are used to form the basis for how society treats GLB persons. Although current popular attitudes towards same-sex relationships have become more favorable within the last 30 or so years<sup>2</sup>, acts of discrimination and hostility remain a significant problem for GLB individuals (Avery et al., 2007; Herek, 2004; Herek, 2009;

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<sup>2</sup> For example, in 2001, only 35% of Americans were in favor of same-sex marriage; however, by 2017, 62% of Americans reported being in favor of same-sex marriage (Avery et al., 2007; Pew Research Center, 2017).

Herek, Gillis, & Cogan, 2015; Rostosky, Riggle, Horne, & Miller, 2009). Discrimination and hostility are just examples of sexual stigma, which is defined as the denial or denigration by society of any non-heterosexual behaviors, persons, relationships, or communities<sup>3</sup> (Goffman, 1963; Herek, 2004; Herek et al., 2015).

Research has shown that GLB individuals are highly likely to be confronted with sexual stigma, both real or perceived, at some time in their lives (Fingerhut, Peplau, & Gable, 2010). For example, one study found that half of the adult GLB participants had experienced discrimination because of their sexual orientation (McCabe, Bostwick, Hughes, West, & Boyd, 2010). Another study found significantly higher rates of felt stigma being reported by GLB individuals than were reported by heterosexual individuals, with 57.4% of GLB respondents endorsing at least one response indicative of felt stigma (Herek, 2009). The same study also found that 33.7% of sexual minority youth, compared to 4.3% of heterosexual youth, reported experiencing perceived discrimination or victimization (Herek, 2009). In fact, a majority of GLB youth report experiencing real or perceived stigma before they even reach adolescence, demonstrating that these experiences happen both early and often in the lives of GLB persons (Herek, 2009).

The effects of sexual stigma increase the likelihood that an individual will experience adverse psychological, social, and physical outcomes (D'Augelli, 2002; Hatzenbuehler, McLaughlin, & Nolen-Hoeksema, 2008; Russell & Joyner, 2001). Indeed, experiences of sexual stigma have been associated with increased rates of internalizing spectrum disorders

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<sup>3</sup> Sexual stigma is just one way often used to describe negative feelings about GLB persons, the most widely used others being "homophobia" and "heterosexism." When broadly defined, these terms may seem interchangeable. However, these three terms only describe related, not identical, concepts. In the current study, sexual stigma refers to the nature of negative feelings about GLB individuals that are held by others. For additional information on homophobia, see, e.g., Herek et al., 2007 or Weinberg, 1972. For additional information about heterosexism, see, e.g., Herek, 2004).



for GLB adolescents when compared to heterosexual adolescents (Bontempo & D'Augelli, 2002; Clements-Nolle et al., 2006; Mays & Cochran, 2001; Meyer, 2003; Murdock & Bolch, 2005; Williams et al., 2005). For example, one study found GLB adolescents were significantly more likely than heterosexual youth to experience discrimination and then also experience depression, self-harm behaviors, or suicidal ideation (Almeida et al., 2009). Moreover, in the time between when a GLB adolescent becomes aware of having same-sex attractions and when he/she discloses his/her sexual orientation, the rates of suicide attempts increase to eight times those found in heterosexual youth (Bagley & Tremblay, 2000; D'Augelli et al., 2001). In fact, some aspect related to sexual orientation was reported as the reason for over 50% of GLB participants (D'Augelli et al., 2001). In addition, GLB adolescents are more likely to have negative perceptions of their bodies, resulting in problematic eating behaviors at both ends of the spectrum (i.e., higher rates of both over- and restrictive-eating disordered behaviors than are found in heterosexual adolescents; Balsam et al., 2005). Finally, victimization based on sexual orientation has been shown to mediate the relation between being GLB and various adverse externalizing behaviors (Williams et al., 2005). For example, GLB adolescents are more likely to engage in the types of risky sexual behaviors that increase the incidence of sexually transmitted infections (STIs) to levels that are significantly higher than those seen in heterosexual adolescents (Balsam et al., 2005).

### **Minority Stress Theory**

Minority stress theory is a conceptual framework focusing on the stress an individual encounters as a member of a stigmatized group. A stigmatized group is one that occupies an inferior status and whose members are prevented from accessing social and economic

opportunities in the same way that those in the majority can (Aseltine, Gore, & Gordon, 2000; Brooks, 1981; Clark, Anderson, Clark, & Williams, 1999). The continual exposure to stigma-related events has been shown to negatively affect an individual's self-esteem and cause a reduced sense of security, resulting in a chronic state of physiological and psychological stress (Brooks, 1981; Cohen, Kessler, & Gordon, 1995; Harris, 1997). The chronicity of stress then increases the risk of experiencing adverse physical and psychological outcomes (Brooks, 1981; Cohen et al., 1995; Harris, 1997).

Experiences of minority stress for GLB persons, also known as gay-related stress, stem from society's negative reactions towards gay/lesbian persons (Meyer, 2003; Rosario, Rotherham-Borus, & Reid, 1996). There are various characteristics of gay-related stress that make it unique from minority stress experienced by most other stigmatized groups (e.g., ethnic or racial minority groups). First, unlike racial/ethnic minority groups, traits that are used to define GLB persons are not always easily detectable (e.g., skin color or other physical features that may indicate membership in a racial/ethnic minority group do not define sexual minority persons). Second, GLB persons are less likely to share their negative experiences with their family, friends, and neighbors because they are often heterosexual and because GLB persons have historically attempted to keep their sexual orientation hidden from others (Lewis, Derluga, Griffin, & Krowinski, 2003). Nor can they draw strength from their community in the same way as those belonging to a racial/ethnic minority group, which have had generations to create and grow a cultural identity unique from the mainstream (Lewis et al., 2003). On the other hand, sexual minority groups have only recently been able to openly cultivate a public identity of their own (Lewis et al., 2003). Fourth, individuals in most other minority groups do not have to contend with the additional stressors of having

to "come out" or the fear of being "found out" by others (Rosario et al., 1996; Rotherham-Borus, Hunter, & Rosario, 1994).

Stress for GLB youth may also stem from responses to indirect manifestations of their sexual orientation (e.g., nonconformity to gender roles), which can increase conflict with parents and cause problematic relationships with peers (Rosario et al., 1996). Although these conflicts appear based on characteristics that do not necessarily define one's sexual orientation, they are often related closely to it (Hershberger & D'Augelli, 1995; Remafedi, 1987; Rosario et al., 1996). Indeed, family conflict absent disclosure has been reported as a significant stressor for GLB youth (Lewis, Derluga, Berndt, Morris, & Rose, 2002) and results in increases in depressive symptomatology and suicidal ideation (Hatzenbuehler, Corbin, & Fromme, 2011; Lewis et al., 2002; Lewis et al., 2003), anxious symptomatology (Rosario, Schrimshaw, & Hunter, & Braun, 2006), bulimia (Williamson & Hartley, 1998), substance abuse (Skinner & Otis, 1996), and risky sexual behaviors (Frost, Parsons, & Nanín, 2007; Rosario et al., 2006). These experiences fit well within the minority stress framework.

### **Predictors of Adverse Outcomes**

**The parent-adolescent relationship.** The increase in autonomy during adolescence marks a decrease in parental influence in many areas of an adolescent's life (Hair, Moore, Garrett, Ling, & Cleveland, 2008; Nickerson & Nagle, 2005). However, research supports the idea that the parent-child relationship remains essential throughout adolescence and plays a substantial role in determining the course of adolescent development, outweighing the influence of peers in many life domains (Laursen & Collins, 2009). Indeed, a parent-child relationship that is characterized by a strong foundation functions as a "secure base" from

which an adolescent can safely explore other relationships, negotiate his/her emerging independence, and develop positive self-perceptions (Nickerson & Nagle, 2005; Parker & Benson, 2004).

A positive parent-adolescent relationship is also protective against many of the adverse outcomes associated with adolescence. For example, supportive parents raise adolescents who show lower rates of delinquency, school misconduct, and substance use (Hair et al., 2005; Parker & Benson, 2004). Adolescents who have secure, supportive relationships with their parents also experience fewer difficulties in coping with the developmental changes of adolescence and exhibit lower rates of psychopathology (Hair et al., 2008; Laursen & Collins, 2009). Conversely, parent-adolescent relationships characterized by low levels of parental support are at an increased risk for experiencing maladaptive behaviors and interpersonal problems, such as delinquency, bullying, and difficulties in peer relationships (Allen et al., 2007; Bean, Barber, & Crane, 2006; Brendgen, Wanner, Morin, & Vitaro, 2005; Deković, Buist, & Reitz, 2004; Scholte, Van Lieshout, & Van Aken, 2001).

The parent-adolescent relationship for GLB youth is similar to that of heterosexual youth in its ability to affect later life outcomes. However, parenting behaviors are affected by an adolescent being GLB and parenting practices often mediate the relations between being GLB and later life outcomes (see, e.g., D'Augelli, Hershberger, Pilkington, 2001; D'Augelli, Grossman, & Starks, 2005; Herdt & Koff, 2000; Savin-Williams, 2001). For example, positive parental support is a protective factor for GLB youth and can deter from the engagement in high-risk behaviors such as tobacco, marijuana, alcohol, and other illicit substance use (DeVore & Ginsburg, 2005; Needham & Austin, 2010; Padilla, Crisp, & Rew,

2010; Ryan, Huebner, Diaz, & Sanchez, 2009; Wills, Resko, Ainette, & Mendoza, 2004). On the other hand, parental rejection or withdrawal of support because the child is GLB is associated with an increased prevalence of adverse behavioral and psychological outcomes, including depression (Goldfried & Goldfried, 2001; Hershberger & D'Augelli, 1995) and substance use (such as alcohol, see, e.g., Rosario et al., 2006; marijuana, see, e.g., Needham & Austin, 2010; other illicit drugs, see, e.g., Ryan et al., 2009), as well as an increased likelihood that the adolescent runs away from home (Cochran, Stewart, Ginzler, & Cauce, 2002; Whitbeck et al., 2004).

Sexual stigma is seen as a significant factor in creating parent-adolescent conflict in families with a GLB child, as it provides the basis for parental attitudes about nonheterosexuality (D'Augelli et al., 2005; Saewyc, 2011). Parents' negative attitudes towards GLB persons are often expressed as ambivalence, rejection, hostility, victimization, and withdrawal of different facets of support from the child (D'Augelli, 2002; D'Augelli et al., 2005; D'Augelli et al., 1998; Pachankis, 2007; Saewyc, 2011). In one study, 12% to 51% of GLB adolescents reported their parents as being intolerant and rejecting or had parents who utilized verbal abuse, threats, and physical violence towards them. Additionally, only half of mothers and one-quarter of fathers were reported as being fully accepting of their GLB child (D'Augelli, Hershberger, & Pilkinton, 1998). A similar study showed that many parents had either a negative (12%-18%) or very negative (27%-39%) response to their child being GLB (D'Augelli et al., 2005).

Parental awareness without adolescent disclosure of GLB orientation can also increase the chances of parental victimization of the child (D'Augelli et al., 2005). Indeed, even youth who are still questioning their sexual orientation report significantly higher levels

of negative consequences from their parents that are attributable to the adolescent's sexual orientation, despite the child's uncertainty. Absent disclosure, parents still possess some knowledge about their child's potential sexual orientation. Strommen (1989) describes this as "subliminal awareness," which is when a parent begins to have vague suspicions of their child's nonheterosexual GLB orientation because the child exhibits certain behavioral patterns, such as failing to fit into typical gender roles. This awareness can occur as early as when the child is ten years old and coincides with the general timing of the child's awareness of his/her sexual preferences (Strommen, 1989). Research has shown that when parental awareness of GLB orientation precedes adolescent disclosure, parents who hold negative views on GLB persons will begin to treat their GLB child even more poorly before the adolescent's disclosure. However, parental speculation about a child being GLB may result in adverse outcomes, with or without the child displaying some form of gender atypicality (D'Augelli et al., 2005).

GLB adolescents who remain in the closet may also elicit a decrease in parental support because of their own awareness of their parents' intolerance of GLB persons or due to an anticipated overestimation of their parents' negative response to their disclosure (D'Augelli et al., 1998; Saewyc, 2011). Indeed, the adolescent's concealment of an essential aspect of his/her identity, as well as the feelings of self-guilt or self-shame, impede the initiation or continuation of a close bond between parent and child (Pachankis, 2007).

**Running away from home.** Adolescents who run away risk experiencing poorer outcomes, including the discontinuation of high school education, high rates of various emotional and behavioral problems, and high rates of physical and sexual victimization when compared to non-runaway adolescents (Tucker et al., 2011). Additionally, runaway youth

often report using drugs and alcohol to cope with or distract from their current situation (Tyler & Johnson, 2006). Runaway youth are more likely to come in contact with deviant peers, who influence or encourage deviancy, as well as increase the likelihood that he/she engages in substance use (Chen, Tyler, Whitbeck, & Hoyt, 2004; Pagare, Meena, Singh, & Saha, 2004; Thompson, 2005). Indeed, running away from home has been associated with increased juvenile arrests (for crimes other than running away) when compared to adolescents who did not run away from home (Kaufman & Widom, 1999). This may be due to more proximal needs, such as stealing money or goods to feed oneself (Kaufman & Widom, 1999; Whitbeck & Simons, 1993).

A poor parent-child relationship dynamic has been the most commonly cited reason why an adolescent runs away from home (Safyer, Thompson, Maccio, Zittel-Palamara & Forehand, 2004; Tucker, Edelen, Ellickson, & Klein, 2011; Tyler & Bersani, 2008). For example, one study found that 41% of adolescents who reported running away attributed leaving home to a poor relationship dynamic with one or both of their parents (Safyer et al., 2004). Specifically, low parental support in early adolescence significantly increases the likelihood that an adolescent will run away from home at least once before entering adulthood (Tucker et al., 2011; Tyler & Bersani, 2008).

GLB adolescents account for anywhere between 13%-38% of runaway youth, much higher than their presence in the general population, which is estimated to be 4.5% of boys and 12% of girls who identify as nonheterosexual (Bontempo & D'Augelli, 2002; Freeman & Hamilton, 2008; Gangamma, Slesnick, Toviessi, & Serovich, 2008; Rew, Whittaker, Taylor-Seehafer, & Smith, 2005; Savin-Williams & Ream, 2007; Van Leeuwen et al., 2006; Wilson et al., 2017). GLB youth most often leave home because of conflicts related to their sexual

orientation. Rew and colleagues (2005) found that 24% of GLB youth left their home solely because of parental homophobia. A similar study found that 73% of gay/lesbian and 26% of bisexual adolescents indicated they were homeless at least in part due to their parents' disapproval of their sexual orientation (Corliss, Goodenow, Nichols, & Austin, 2011). Additionally, GLB youth are more likely than are heterosexual youth to report having been kicked out of the home due to conflicts regarding their sexual behaviors (Whitbeck et al., 2004). Indeed, gay adolescent males are five times more likely than heterosexual males to leave home because of a conflict regarding their engagement in sexual activities (Whitbeck et al., 2004).

In addition to being more likely to run away from home, GLB runaway youth are at a higher risk for experiencing adverse outcomes while on the run than are heterosexual runaway adolescents (Feinstein et al., 2001; Salomonsen-Sautel et al., 2008). For example, homeless GLB adolescents are found to abuse alcohol and illicit substances significantly more than do heterosexual homeless youth (e.g., use more types of substances and ingest more substances when using; Van Leeuwen et al., 2006). In addition, GLB runaway youth are more likely to suffer from depression and have suicidal ideation than are heterosexual runaway youth (Noell & Ochs, 2001).

### **Sexual Orientation and Delinquency**

Some studies have documented the differences in offending behaviors among GLB and heterosexual individuals. However, until now the focus has been on differences in dispositions or their treatment while in custody (Curtin, 2002; Hahn, 2004; Himmelstein & Brückner, 2011; Katz, 2014; Squatriglia, 2008). Of those related to GLB offending behaviors, one study found that gay adult males committed fewer criminal or violent acts than did



heterosexual adult males, but that bisexual males committed many criminal behaviors significantly more often than either gay or heterosexual adult males (Ellis, Hoffman, & Burke, 1990). However, this study sampled adult participants not adolescents. Other studies have shown rates of incarcerated GLB youth to be between 7-13% for boys and 23-40% for girls (Garnette et al., 2011; Wilson et al., 2017). Similar to rates of running away, the rates of incarcerated GLB youth are disproportional given their presence in the general population (Garnette et al., 2011; Walters, Chen, & Breiding, 2013; Wilson et al., 2017). However, both of these studies sampled adolescents from juvenile correctional facilities who had already been through adjudication and disposition or were currently in custody (Garnette et al., 2011; Wilson et al., 2017). A more recent longitudinal study of adolescents found that gay males were significantly more likely to commit nonviolent acts of delinquency and were significantly more likely to commit violent acts of delinquency at two and three of the four time points measured, respectively (Beaver et al., 2016). Additionally, bisexual males and females showed more delinquency overall when compared to both heterosexual and gay/lesbian males and females, respectively (Beaver et al., 2016). Closely related studies of runaway and homeless youth found that 50-72% of GLB adolescent males engaged in prostitution, whereas only 7-9% of heterosexual adolescent males engaged in the same behavior (Chen, Thrane, Whitbeck, Johnson, & Hoyt, 2007; Rosario, Schrimshaw, & Hunter, 2012; Van Leeuwen et al., 2006; Whitbeck, Chen, Hoyt, Tyler, & Johnson, 2004; Feinstein, Greenblatt, Huss, Kohn, & Rana, 2001; Tyler, Whitbeck, Hoyt, & Cauce, 2004).

Research has not explored what mechanism(s) may predict differences in offending behaviors among GLB and heterosexual adolescents. Currently, the only available literature on this topic is theoretical or is based solely on anecdotal survey data. For example, Feinstein

and colleagues (2001) surveyed government officials, lawyers, judges, service providers, and GLBT [Transgender] youth in New York City and concluded that the crimes associated with GLBT youth were generally non-violent in nature and were committed in furtherance of meeting emotional (e.g., substance use) or physical (e.g., to obtain food or shelter) needs brought about because of their rejection and stigmatization (Feinstein et al., 2001). No study, to my knowledge, has identified mediating mechanisms that may be responsible for differences in offending behaviors between GLB and heterosexual adolescents.

Gay-related stress may explain differences in rates of certain delinquent and antisocial activities for GLB adolescents when compared to heterosexual adolescents. As described earlier, when compared to heterosexual youth, being GLB is related to lower levels of parental support and higher rates of running away, and runaway GLB youth experience greater amounts of adverse outcomes than runaway heterosexual youth. Moreover, inadequate parental support, particularly if it leads to running away, may place GLB youth in a position where they commit delinquent acts to meet their basic physical and psychological needs. For example, although GLB youth may be just as likely to commit aggressive offenses (e.g., getting in fights or using a weapon), the increased experiences of a lack of parental support and running away may make GLB adolescents more likely to commit non-aggressive-related (or income-related offenses), such as using checks or credit cards illegally, theft, and/or burglary, than heterosexual youth.

### **Bisexuality**

Bisexuality is an extremely understudied category of sexual orientation, making the empirical understanding of this group limited (Diamond, 2008; Russell & Seif, 2001). There are several reasons for the lack of studies on bisexual persons. One reason is that there

remains a lack of consensus on definitions of bisexuality, which has led to some studies to exclude bisexual individuals from their samples or analyses altogether (Rust, 2000). Indeed, there is still a debate as to whether bisexuality is (a) a temporary stage of sexual development caused by denial of actual sexual orientation (i.e., a transitory or experimental stage between heterosexuality and being gay/lesbian), (b) a third, fixed category of sexual orientation defined by an attraction to both sexes, and therefore completely separate from heterosexuality or being gay/lesbian, or (c) the strongest manifestation for all individuals to have a situation-dependent, fluid and malleable sexual attraction (Diamond, 2008). However, results from multiple studies using longitudinal data are inconsistent with the notion that bisexuality is a transitional or experimental phase, instead remaining stable over time (Diamond, 2008; Pattatucci & Hamer, 1995; Russell & Seif, 2001).

Second, many studies of sexual orientation collapse bisexual individuals into the same group as gay and lesbian individuals to form a "GLB" or "non-heterosexual" category, thus making the assumption that being bisexual and being gay/lesbian are the same (Russell & Seif, 2001). However, research affirms that, when possible, researchers should avoid collapsing data from bisexual and gay/lesbian individuals for analysis (Russell & Seif, 2001). Although bisexual individuals have been shown to suffer from some of the same risk factors as gays and lesbians (e.g., stigmatization), the appropriateness of collapsing these categories into one "GLB" category is unsupported by the research. Indeed, bisexual individuals differ from both heterosexual and gay/lesbian adolescents on several types of outcomes. For example, bisexual adolescents differ from heterosexuals in that they are more likely experience lower levels of connectedness to family and lower perceptions of care from other adults (Gallagher, Rostosky, & Hughes, 2004; Russell, Seif, & Truong, 2001), and from

gays/lesbians in that they report higher levels of risky sexual behaviors (Goodenow, Netherland, & Szalacha, 2002; Saewyc et al., 2009). In fact, some studies have found more similarities between gays/lesbians and heterosexual persons than between either group and bisexual individuals (Robin et al., 2002; Saewyc et al., 2006). For example, bisexual adolescents are more likely than both gay/lesbian and heterosexual adolescents to engage in risky sexual behaviors (Saewyc et al., 2006), attempt suicide (Robin et al., 2002), commit delinquency (Udry & Chantala, 2002), and use substances (Robin et al., 2002; Udry & Chantala, 2002).

Although empirically validated, the reasons why bisexuals often incur more risk and have less favorable outcomes than do gay/lesbians remain unknown. One possibility is that there are a greater number of people who identify as bisexual than gay/lesbian, which would make it easier to detect statistically significant differences between groups (Galliher et al., 2004; Udry & Chantala, 2002). Another possibility is that bisexual individuals struggle with more confusion over their sexual identity, as they do not fit nicely into the dichotomy of "gay" and "straight", increasing feelings of distress and alienation, as well as preventing the disclosure and healthy discussion of their sexual identity (Russell, Franz, & Driscoll, 2001). This type of identity confusion has been observed in biracial persons (i.e., those having one Black parent and one White parent), who at the same time belong to two (or more) groups, yet also belong to neither. Biracial adolescents are also at greater risk for poor health and behavioral outcomes than are adolescents of one race (Udry, Li, & Hendrickson-Smith, 2003). These findings have been attributed to biracial individuals reporting a lack of connection to their neighborhood and a lack of a sense of community, whereas individuals whose parents are both of the same race do not (Bolland et al., 2007; Gibbs & Moscovitz-

Sweet, 1991). Similar reasons may explain why bisexual adolescents are also at a higher risk for poorer outcomes.

### **Gender and Sexual Orientation**

Gender differences have been found within comparisons of gay/lesbian and heterosexual youth. As noted earlier, gay and bisexual males are significantly more likely to engage in prostitution behaviors than are heterosexual males (Whitbeck et al., 2004). However, results for females in the same study showed that heterosexual females were significantly more likely to engage in prostitution than were lesbian females (Whitbeck et al., 2004). Gay men also show a greater disparity in body satisfaction with heterosexual men than lesbians do with heterosexual females (Morrison, Morrison, & Sager, 2004). Also, when looking at alcohol-related problem behaviors, the disparity in risk between lesbian/bisexual females and heterosexual females was found to be significantly higher than the disparity in risk between gay/bisexual males and heterosexual males (Ziyadeh et al., 2006).

Research focusing on gender differences solely in bisexual youth is limited. Of these studies, most have concentrated exclusively on female youth (see, e.g., D'Augelli, 2003; Diamond, 2008; Russell & Seif, 2001). This focus on bisexuality in female youth may be practical, as there is a higher prevalence of females who identify as bisexual than there are males, therefore making bisexual females methodologically easier to study (Russell & Seif, 2001). However, given the observed gender by sexual orientation interactions found among gay/lesbian and heterosexual youth, it is reasonable to assume that gender differences also exist within the comparison of bisexual youth and heterosexual youth.

## The Current Study

The current study tests risk factors for criminal offending in bisexual adolescents, an important group that is largely missing from both GLB and delinquency literature. The present study expands on previous literature by providing the first test of the mechanisms that may account for any differences in offending between bisexual and heterosexual adolescents. Understanding the effects of supportive parenting behaviors, as well as running away from home, may help to create intervention programs to decrease delinquency in GLB adolescents.

This study uses three waves of data from a longitudinal, nation-wide sample of children who were a part of the Add Health study to test the following hypotheses (see Figure 1 for graphical representation):

1. Bisexual adolescents commit a significantly wider variety of income generating offenses than do heterosexual adolescents, but do not commit a significantly wider variety of aggressive offenses.
2. Bisexual adolescents experience less parental support and are more likely to run away than are heterosexual adolescents.
3. Less parental support given to bisexual children is associated with bisexual adolescents running away more often than heterosexual adolescents, which in turn will increase the variety of income generating offenses committed by bisexual adolescents when compared to heterosexual adolescents.
4. The hypothesized relations differ among male and female youth.

## METHOD

### **The Original Study**

**Participants.** The current study used data from the National Longitudinal Study of Adolescent to Adult Health (Add Health [N = 20,745], Harris et al., 2009), a school-based longitudinal study of health behaviors and attitudes during adolescence and the subsequent outcomes in young adulthood. Data collection at Wave I was conducted between September 1994 and April 1995 and four waves of data have been collected. In Wave I, adolescents were asked to participate in both school and in-home interviews. Wave II (N = 14,738) in-home interviews took place between 1995 and 1996 and included adolescents from Wave I. Wave III (N = 15,197) data collection took place between 2001 and 2002 and included participants from the previous waves who were 18 years of age or older at the time of the Wave III interview.

**Recruitment.** Participants were selected for potential enrollment by sampling high schools throughout the United States. There were 26,666 schools sampled across the United States for potential enrollment. Systematic sampling and stratification methods were used to choose 80 high schools out of the original 26,666 that were representative of US schools with respect to region, urbanicity, size, type, and ethnicity (Harris et al., 2009). To be included, the school had to offer the 11th grade and enroll more than 30 students. Of the original 80 selected high schools, 52 were eligible and agreed to participate. Similar high schools were found to replace the remaining 28 schools. Participant high schools were then asked to identify junior high or middle ("feeder") schools that were expected to provide at least five students to their high school. A single feeder school was chosen for each selected

high school. The final number of participating junior high/middle and high schools was 132<sup>4</sup>.

From these 132 schools, a total of 90,188 students completed a 45-minute, in-school questionnaire. Students who completed the in-school questionnaire were then eligible for an in-home interview. Approximately 200 adolescents were selected from each school to have an in-home interview. The final core sample of adolescents (N = 12,105) included an oversampling of Cuban, Puerto Rican, Chinese, and physically disabled adolescents, as well as an oversampling of black adolescents with at least one college-educated parent.

Participants for Waves II and III were drawn primarily from the pool of Wave I participants. Participants in the 12th grade who exceeded age eligibility requirements were removed from data collection and replaced with a small number of adolescents who did not participate in Wave I. Additionally, participants who were younger than 18 years old at the start of Wave III data collection were excluded from the Wave III participant sample.

**Procedure.** Wave I consent for the in-school questionnaire was obtained by using a passive consent form (i.e., parental consent was assumed unless a parent/legal guardian indicated otherwise) sent to the parent/legal guardian of the adolescent. However, some schools did require active consent forms (i.e., a parent/legal guardian had to indicate consent for their child to participate). For both Waves I and II, participation in the in-home interview required written informed consent from both a parent/legal guardian and the adolescent.

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<sup>4</sup> Feeder schools were not selected for schools spanning grades 7-12.



Parental consent was not needed in Wave III, as respondents were at least 18 years of age at the time of data collection. Therefore, respondents were asked to read and sign an informed consent form in order to participate. All respondents who agreed to participate in the interview received a financial incentive payment. Participants in Wave III were asked to complete an in-home interview, as well as provide saliva and urine samples (used for HIV, STI, and genetic testing). All procedures met IRB requirements for the protection of human subjects.

### **The Current Study**

**Participants.** Participants for the current study (N = 10,542) were drawn from the larger Add Health participant pool. Primary analyses used participant responses from the First (M age = 15.7), Second (M age = 16.1) and Third (M age = 21.6) Waves of data collection. Several criteria were required for inclusion in the current study. First, the participant must have participated in the in-home interview at both Waves I and II. Second, participants who reported only same-sex romantic attractions at Wave I or identified as strictly gay/lesbian at Wave III were excluded (the remaining participants reported only opposite-sex romantic attraction [Wave I] or identified as strictly heterosexual [Wave III] or reported at least some bisexual romantic attraction/identity at either Wave I or III). Finally, participants who were 20 years of age or older at Wave II were excluded due to delinquency being, by definition, unique to childhood/adolescence. This meant the oldest participants at Wave II would be 19 years old and reporting on behaviors that occurred over the year prior to the Wave II interview date, and therefore most likely to be considered "delinquent" as opposed to "criminal."

**Measures.** The measures used in the current study were collected as a part of the larger interview battery administered in the longitudinal study described above. Descriptive statistics for all study variables described below are displayed in Table 1.

**Gender.** Adolescent gender was obtained by asking the interviewer to confirm that respondent's sex was male or female (and to ask the participant if necessary). In this subsample, 46.8% of respondents were identified as male. Subsequent analyses were performed separately by gender in an exploratory manner to discern whether the hypothesized relations differed for males versus females.

**Age.** Adolescents self-reported the month and year they were born and the interviewer provided the month and year of the interview. Age was then calculated by subtracting the interview month and year from the adolescent's birth month and year. Wave I age in years ( $M = 15.8$  years) was used as a covariate due to the likelihood that the experiences occurring between Wave I age range (12 - 18 years old) would have some effect on other study variables.

**Race/ethnicity.** Adolescents self-reported their race/ethnicity by responding to the following questions: (1) "Are you of Hispanic or Latino origin?" ("yes" or "no") and (2) "What is your race?" (available responses were: "White," "Black or African American," "American Indian or Native American," "Asian or Pacific Islander," or "Other"). For this study, those who identified as American Indian or Native American, Asian or Pacific Islander, Other, or endorsed more than one race were placed in an "Other" category. For this subsample, 54.0% of participants identified as White, 19.4% identified as Black, 14.4% identified as Hispanic, and 12.2% were placed in the "Other" category.

Effect coding was used to create three variables so that race/ethnicity could be used as a covariate. Effect coding uses contrast weights to test the deviations in each group mean from the grand mean of a tested variable. The first contrast weights assigned a value of "1" to Black participants, a value of "0" to Hispanic and "Other" participants, and a value "-1" to White participants. The second contrast weights assigned a value of "1" to Hispanic participants, a value of "0" to Black and "Other" participants, and a value of "-1" to White participants. The third contrast weights assigned a value of "1" to "Other" participants, a value of "0" to Hispanic and Black participants and a value of "-1" to White participants. White participants received a "-1" for all effect codes and thus became the reference group. Race/ethnicity was included as a covariate due to the likelihood of different experiences that may occur between participants belonging to different racial/ethnic groups.

***Sexual orientation.*** Aspects of sexual orientation were assessed at Waves I, II and III, first when participants were in their early teenage years (Waves I and II) and again when participants were over the age of 18 (Wave III). Waves I and II assessed the sexual attraction aspect of sexual orientation by asking both boys and girls: "Have you ever had a romantic attraction to a female?" ("yes" or "no") and "Have you ever had a romantic attraction to a male?" ("yes" or "no"). The current study used Wave I responses and separated participants into two categories. The first category included adolescents who reported being attracted to individuals of the opposite sex and reported no same-sex attraction and the second included adolescents who reported being attracted individuals of both sexes (i.e., a bisexual attraction). Using this classification, 4.5% of participants reported bisexual romantic attraction.

In Wave III, an additional measure that assessed the sexual identity aspect of sexual orientation was asked. The question asked the participant to "Please choose the description that best fits how you think about yourself." Response options were "100% heterosexual (straight)," "mostly heterosexual (straight), but somewhat attracted to people of your own sex," "bisexual – that is, attracted to men and women equally," "mostly homosexual (gay), but somewhat attracted to people of the opposite sex," "100% homosexual (gay)," and "not sexually attracted to either males or females." The current study only included those who identified as (1) 100% heterosexual or straight or (2) a combination of mostly heterosexual (straight), but somewhat attracted to people of your own sex; bisexual – that is, attracted to men and women equally; and mostly homosexual (gay), but somewhat attracted to people of the opposite sex.<sup>5</sup> Using this classification, 9.7% of participants identified as bisexual. The current study assigns the label "romantic attraction at Wave I" to refer to the Wave I sexual orientation variable and "sexual identity at Wave III" to refer to the Wave III sexual orientation variable.

There were several reasons this study used two indicators of sexual orientation measured at different time points. First, the Wave I question assessing sexual attraction was preferable because it was measured before the outcome variable, thus allowing for prospective prediction. However, this suitability of this variable as a measure of sexual orientation has been questioned due to higher rates of same-sex attraction being reported than those observed in other samples, as well as the high number of inconsistent responses

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<sup>5</sup> The inclusion of "mostly heterosexuals" into the "bisexual" category has been endorsed as an appropriate strategy for research, as "mostly heterosexual" individuals show at least some same-sex romantic attraction or behavior. More importantly, however, this group experiences elevated health risks when compared to strictly heterosexuals and may also experience some degree of minority stress (Katz-Wise, Calzo, Li, & Pollitt, 2015; Thompson & Morgan, 2008; Vrangalova & Savin-Williams, 2014).

between Waves I/II and Waves III/IV (Savin-Williams & Joyner, 2014a; Savin-Williams & Joyner, 2014b; Savin-Williams & Ream, 2007). Three reasons have been put forth to explain these inconsistencies, either adolescents who reported same-sex attraction in earlier waves went "back in the closet" in later waves, participants misunderstood the meaning of "romantic attraction" in the earlier waves, or there was adolescent malfeasance in which participants intentionally marked an untrue response (Savin-Williams & Joyner, 2014a). Although Savin-Williams & Joyner have settled mostly on the third explanation, other investigators have disagreed by noting errors in their empirical and theoretical reasoning (see, Li, Katz-Wise, & Calzo, 2014 and Katz-Wise, Calzo, Li, & Pollitt, 2015).

Savin-Williams and Joyner (2014a) suggest using Wave III data as an indicator of sexual orientation. However, for the current study, the limitation of the Wave III indicator is that it does not allow temporal precedence in the model because it was first measured in Wave III when participants were adults. However, there are still reasons for its use jointly with romantic attraction at Wave I as an indicator of sexual orientation. First, romantic attraction and sexual identity are two separate dimensions of sexual orientation that may tap into different developmental risks and outcomes, and testing both may be informative in strengthening or challenging the concept that these are two distinct facets of sexual orientation. Second, the presence of differences in factors such as knowledge, openness, and expressions of sexuality occurring between the age range from Waves I/II and Waves III/IV does not seem unreasonable. Indeed, there is evidence of GLB persons reporting heterosexual orientation in childhood and early adolescence only to later disclose a GLB identity (Friedman, Marshal, Stall, Cheong, & Wright, 2008; Marshal et al., 2013), and there is no evidence suggesting that this phenomenon occurs in the opposite direction. Finally, other

studies using the Add Health dataset have used this method and found it to be a reasonable indicator of sexual orientation for analytic purposes (see, e.g., Corliss et al., 2011; Marshal et al., 2013; Needham, 2012).

The current subsample observed similar rates of bisexuality as Savin-Williams and Ream (2007) did for both Wave I attraction and Wave III identity. Savin-Williams and Ream reported rates of both-sex romantic attraction in Wave I for boys at 6.3% and for girls at 3.9%, similar to those found in this study (5.8% of boys and 3.4% of girls). Rates for reporting at least some bisexual identity in Wave III found by Savin-Williams and Ream were 4.4% for boys and 14.0% for girls, which were also similar to those found in the current study (5.1% of boys and 13% of girls). Accordingly, the present study estimated the hypothesized model separately using Wave I and Wave III indicators.

***Maternal support.*** At Wave I, participants were asked several questions about their relationships with one or both of their custodial/residential parent(s). Only mother responses were used in the current study, as many adolescents did not report on a father and a confirmatory factor analysis (CFA) did not produce sufficient model fit for paternal support. To represent maternal support, a latent variable was created from four response items. The first two were "Overall, are you satisfied with your relationship with mom?" and "Most of the time, your mother is warm and loving towards you." Responses for these items ranged from 1 (strongly agree) to 5 (strongly disagree) and were reverse coded. The second two questions were: "How close do you feel to your mom?" and "How much do you think she [mom] cares about you?" Responses for these items ranged from 1 (not at all) to 5 (very much). Therefore, for the maternal support variable, higher numbers indicated greater perceptions of support.

A set of analyses supported modeling maternal support as a composite latent variable. First, zero-order correlations among the four variables showed that all four variables were significantly and highly correlated with each other (see Table 2). Second, a confirmatory factor analysis was conducted using MPlus version 8.15 (Muthén & Muthén, 1998-2017) to verify that a one-factor model was a good fit for the data. Standardized factor loadings for each variable were greater than or equal to 0.79 (see Table 3). Model fit was evaluated with the robust unweighted least squares with mean and variance adjustments (ULSMV) chi-square, comparative fit index (CFI), Tucker-Lewis Index (TLI), and root mean square error of approximation (RMSEA). The model fit statistics indicated that the one factor model was an adequate fit for the data (see Table 4).

***Running away.*** Running away from home was assessed by a single item asked at Wave I. Participants were asked, "In the past 12 months, how often did you run away from home?". Response options were: "0 (never)", "1 (one or two times)", "2 (three or four times)", or "3 (five or more times)". The behavior was only considered to be "running away" if he/she was away from the home overnight. For this study, participants were assigned a value of "0" if they never ran away or "1" if they ran away from home one or more times. In this subsample, 7.4% of participants reported running away from home at least once.

Although running away was hypothesized to be the result of lower maternal support, the current study measured both running away and maternal support at Wave I. Although this disrupts temporal precedence, previous research has shown that negative parenting practices are consistently reported by adolescents as the main reasons they choose to run away, and this relationship has not been shown to operate in the opposite direction

(although running away may subsequently affect other parenting practices, such as parental monitoring or parental control; Safyer et al., 2004; Tucker et al., 2011; Wolk & Brandon, 1977). This study assumed that any significant relation between maternal support and running away was due to the effect that maternal support would have on running away.

Previous research has often confounded "running away" and "homelessness," despite the two representing different, yet not mutually exclusive, constructs. Indeed, leaving home (i.e., running away) is different from not having a home (i.e., homelessness), but one could also run away from home then become homeless or a youth who remains with his/her parents despite the entire family being homeless would not be considered a "runaway". These differing definitions make forming general conclusions about "runaway" youth somewhat difficult. For example, Corliss and colleagues (2011) categorized adolescents as homeless as long as they did not identify themselves as living "at home with my parents or guardians." Yet, this would not account for the adolescent who may be living in a home during this period (e.g., if they lived with a friend's family). Whereas Whitbeck et al. (2004) combined homelessness and running away into one category, despite the two being different concepts. Although both running away and homelessness can theoretically lead to offending, the current study focuses only on running away because only the measure of running away was available at Wave I.<sup>6</sup>

***Delinquent activity.*** Adolescents self-reported their involvement in various antisocial and illegal activities at Waves I, II and III. The current study chose 13 offending behaviors (see Appendix A) to assess two separate types of offending. Participants reported

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<sup>6</sup> Waves III and IV each had an item assessing homelessness in addition to measuring running away.



on both their aggressive offending (e.g., deliberately damaging property that didn't belong to you; 7 items) and income offending (e.g., bought, sold, or held stolen property; 6 items). At both Waves I and II, the participant indicated how often he/she engaged in any of these activities in the past 12 months prior to the interview. If the adolescent reported engaging in the activity one or more times, they were assigned a value of "1" for that activity, indicating that they engaged in the behavior. If the adolescent reported that they did not engage in the behavior over the previous 12 months, they were assigned a value of "0", indicating that they did not engage in the behavior within 12 months prior to the interview. The resulting constructs are offending variety scores, which represent the severity of the individual's offending behaviors. This categorization has been used in other studies of adolescent offending (see, e.g., Mulvey et al., 2004).<sup>7</sup>

### **Data Analytic Strategy**

**Preliminary data concerns.** There were several characteristics of the Add Health dataset that were addressed before the estimation of the hypothesized models. First, because the Add Health study used a clustered sample, and these clusters were sampled with unequal probability, proper analysis of the data required that adjustments be made for sample selection and participation (Chen & Chantala, 2014). Failure to account for these issues can lead to underestimation of standard errors and result in false-positives (Chen & Chantala, 2014). Therefore, three Wave I weights were used in the data analyses. First, a cross-sectional sampling weight accounted for the unequal probability of selection (Chen & Chantala, 2014). This weight worked in four ways, it (1) compensated for differences in school selection

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<sup>7</sup> For further information on offending variety as a measure of delinquency, see Moffitt, Caspi, Rutter, & Silva, 2001

probability, (2) adjusted the sample responses for school ineligibility and school nonresponse and brought estimates for the sample in line with population figures, (3) compensated for differences in student selection probabilities across school, grade, and gender, and (4) compensated for non-response in the in-home questionnaire. The second was a post-stratification adjustment weight that allowed for equal representation by region (i.e., Northeast, North Central, South, and West). The final weight adjusted for the clustered sampling design utilized by the Add Health investigators. This weight corrected for the unequal probability of cluster selection for data collection (Chen & Chantala, 2014).

The offending variety scores calculated were positively skewed, zero-inflated count scores. Therefore, a zero-inflated Poisson model that allowed for frequent zero-valued observations was used to correct for potential data analytic issues (Lambert, 1992; Van den Broek, 1995). A zero-inflated regression model attempts to model count data with an excess of zeros by estimating both "true zeros" and "excess zeros." True or expected zeros are zeros that are thought to genuinely exist in the data (e.g., a participant who reports not engaging in delinquent activity because they did not have the opportunity). However, excess or structural zeros are present in the data for reasons separate than those for true zeros (e.g., a participant who reports not engaging in delinquent activity because they abstain from participating in offending behaviors altogether). Accordingly, these excess zeros are modeled independently through the introduction of a binary outcome variable that predicts the logit of being a structural zero simultaneously with the prediction of expected zeros in the Poisson model. The result of this method is that it models two outcomes. The first estimates the differences in count scores (i.e., the variety offenses the participant committed) and the

second predicts the likelihood of whether or not the outcome occurred (i.e., the probability that the participant committed any offense).

**Mediational analyses.** Analyses for the present study were conducted in MPlus version 8.15 (Muthén & Muthén, 1998-2017). For all models, age, race, aggressive offending at Wave I, and income offending at Wave I were entered as covariates. To test the mediational hypotheses, structural equation modeling (SEM) was used. The results of the SEM analyses assessed whether differences in maternal support mediated the effect of sexual orientation on offending and on running away. Direct and indirect effects were evaluated by examining the values of the unstandardized parameter estimates (or unstandardized path coefficients) between variables divided by its respective standard error. The resulting values are equivalent to a z-statistic, in which z-values greater than 1.95 are significant at  $p \leq 0.05$  (Hoyle, 1995).

Due to observed gender differences found in previous literature, this study's hypotheses were tested as a multilevel mixture model. This technique allowed for both the modeling of multiple groups, as well as the modeling of complex survey data (Muthén & Muthén, 2017). Thus, the hypotheses were estimated with one level representing boys and the second representing girls. To test whether estimating boys and girls separately fit the data better than estimating a model in which boys and girls were modeled together, several models were evaluated and compared. Model fit was determined by comparing multiple fit indices (i.e., loglikelihood estimates, Akaike Information Criteria [AICs], Bayesian Information Criteria [BICs], and Adjusted Akaike Information Criteria [ABICs]), as well as calculating the Satorra-Bentler Scaled Chi-Square Difference Test values between models.

Model fit was first estimated for boys and girls with all paths of the model unconstrained (or freed). Models were then estimated several more times with an increasing number of paths constrained each time, and then finally with all paths constrained to be equal. The first path constrained was that between the sexual orientation variable and maternal support. Next, an additional constraint of equality was placed on the path from sexual orientation to running away. The next additional path constrained to be equal was the path from maternal support to running away. It was previously decided that if model fit did not improve after comparing these models, then constraining paths one-by-one would be superseded by the model which constrained all paths to be equal. Therefore, after the fourth model showed increasingly poor model fit, the last model estimated was one in which all paths were constrained to be equal.

The Satorra-Bentler Scaled Chi-Square Difference Test ( $TR_d$ ) was used to compute chi-square values based on the loglikelihood and scaling correction factors obtained from the MLR estimator in MPlus (Muthén & Muthén, 2011; Satorra & Bentler, 2010). Differences in model fit were obtained by comparing the least restrictive model to the model in which only one path was constrained to be equal between the two groups. Next, the model with one path constrained to be equal was compared to the model in which two paths were constrained to be equal between the two groups, and so on until the model in which all paths were constrained to be equal was compared to the model in which three paths were constrained to be equal.

In order to obtain the chi-square values, first a difference test scaling correction ( $c_d$ ) was computed for each comparison through the following equation:

$$c_d = (p_0 * c_0 - p_1 * c_1) / (p_0 - p_1) \quad (1)^8$$

For each comparison, the resulting values were then entered into the following equation to compute a chi-square value ( $TR_d$ ):

$$TR_d = 2 * (L_0 - L_1) / c_d \quad (2)^9$$

## RESULTS

### Gender Differences

T-tests and chi-square analyses showed that boys differed significantly from girls on many study variables (see Table 1). First, the proportion of males who were Black or Hispanic was significantly less than the proportion of girls who were Black or Hispanic. Additionally, boys were significantly older than were girls. Third, boys were more likely to report romantic attraction to both sexes at Wave 1 than were girls. However, in Wave III there were significantly more girls who identified as at least somewhat bisexual than there were boys. Furthermore, boys were significantly less likely to have run away than were girls and boys also reported significantly more maternal support than did girls. Finally, boys committed significantly more types of aggressive and income offenses than did girls for both Waves I and II.

### Zero-Order Correlations

**Boys.** Results of the zero-order correlations for boys were also largely consistent with this study's hypotheses (see Table 5). First, boys who reported having a romantic

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<sup>8</sup> Where  $p_0$  = number of parameters in nested model,  $p_1$  = number of parameters in comparison model,  $c_0$  = scaling correction factor for the nested model, and  $c_1$  = scaling correction factor for comparison model.

<sup>9</sup> Where  $L_0$  = the loglikelihood value for the nested model and  $L_1$  = the loglikelihood value for the comparison model.

attraction to both sexes at Wave I were significantly more likely to report having run away, as well as committed significantly more types of aggressive offenses than did boys who reported only opposite-sex attraction. Boys who reported higher levels of maternal support were significantly less likely to have run away, as well as committed significantly fewer types of aggressive and income offenses, than did boys who reported lower levels of maternal support. Also, boys who ran away committed significantly more types of aggressive and income offenses than did than did boys who did not run away. Contrary to study hypotheses, boys who reported at least some bisexual identity at Wave III committed significantly less types of aggressive offenses than did heterosexual boys.

Additionally, boys who reported having a romantic attraction to both sexes at Wave I were significantly more likely to report at least some bisexual identity at Wave III. Older boys reported significantly less maternal support than did younger boys. Hispanic boys were significantly more likely than other boys in this subsample to report having at least some bisexual identity at Wave III, as well as committed significantly more types of aggressive and income offenses. Finally, Black boys reported significantly less maternal support than did the remaining boys in the subsample.

**Girls.** All results from the zero-order correlations were consistent with study hypotheses. Pearson correlations were utilized for relations between continuous/count variables and tetrachoric correlations were utilized to test relations with dichotomous variables. Girls who reported attraction to both sexes at Wave I reported significantly less maternal support, were significantly more likely to have run away and committed significantly more types of aggressive and income offenses than did girls who reported only opposite-sex attractions (see Table 6). These same relations were significant when the Wave

III identity variable was used in place of romantic attraction at Wave I. Additionally, girls who reported higher levels of maternal support were significantly less likely to have run away and also committed significantly fewer types of aggressive and income offenses than did girls who reported lower levels of maternal support.

Girls who reported romantic attraction to both sexes at Wave I were significantly more likely to report a bisexual identity at Wave III. Older girls were more likely to report having a romantic attraction to both sexes at Wave I, reported lower levels of maternal support and committed a fewer variety of aggressive and income offenses than did younger girls. However, older girls were significantly more likely to have run away than were younger girls.

Since effect coding was used to test race/ethnicity differences in all analyses, the resulting values represent comparisons between a specific racial/ethnic group and grand mean of all participants in all other groups. Findings showed that Hispanic girls were significantly more likely to report having a romantic attraction to both sexes at Wave I, and to report that they had run away, than did the remaining girls. They also reported having lower maternal support and committed a greater variety of both aggressive and income offenses. Black girls were significantly less likely than the remaining male participants to identify as at least somewhat bisexual at Wave III, as well as significantly less likely to have run away. They also committed significantly fewer types of income offenses, but committed significantly more types of aggressive offenses, than did the remaining male participants. Girls belonging to the "Other" category were significantly more likely to have run away and committed significantly more types of aggressive offenses than did the remaining girls.

## Regression Diagnostics

MPlus does not yield regression diagnostics, so OLS (Ordinary Least Squares) regression using SPSS was used to determine whether there were issues of multicollinearity, outliers, or influential cases in the data. Potential multicollinearity was assessed by examining the previously reported zero-order correlations for values above 0.500, as well as by computing each variable's Variation Inflation Factor (VIF) score and then examining the resulting values for those exceeding 10. Correlations between study predictors did not exceed  $r = 0.500$  and all VIF values were less than 2, suggesting that no serious multicollinearity problems should occur.

Outliers are observations with unusually large residual values and influential cases, are those for which removal would substantially change the estimate of the resulting coefficients. Observations in which the absolute value of its standardized residual is greater than two are considered outliers. Influential cases are those in which the absolute values of its standardized DFBETA is greater than two divided by the square root of the number of participants ( $|SDBETA| > 0.0195$  for this sample). Only one case appeared to be influential, with a SDBETA of -0.0268. However, the case was not an outlier, as its ZRESID = 1.75, nor did it exceed the threshold for subsequent diagnostic tests (i.e., acceptable leverage and Cook's D values). Therefore, the case was not removed for purposes of data analyses.

## Structural Equation Modeling

**Justification for separate models for boys and girls.** As previously described, a series of models with increasing equality constraints were estimated and then compared using several fit indices (e.g., Akaike information criterion [AIC], Bayesian information



criterion in [BIC]) order to determine whether estimating the models separately for boys and girls was appropriate. Results from the Satorra-Bentler chi-square difference tests for the model using romantic attraction at Wave I showed non-significantly worse model fit when comparing the unconstrained model to the model in which the path from romantic attraction to maternal support was constrained to be equal (see Table 7). The additional equality constraint on the path from romantic attraction to running away also showed non-significantly worse fit than the preceding model, as did the subsequent additional constraint of the path from maternal support to running away. The model in which all paths were constrained to be equal showed significantly worse model fit when compared to the preceding model, indicating that a multi-group model separating boys and girls fit the data better than did a single-group model.

The model with sexual identity at Wave III as a predictor also showed worse model fit with increasing constraints (see Table 8). The model in which the path from sexual identity to maternal support was constrained to be equal for boys and girls showed significantly worse model fit when compared to the model in which all paths remained free. The additional equality constraint on the path from sexual identity to running away also showed non-significantly worse fit than the preceding model, as did the subsequent additional constraint of the path from maternal support to running away. The model in which all paths were constrained to be equal showed significantly worse model fit when compared to the preceding model, indicating that a multi-group model separating boys and girls fit the data better than did a single-group model. As such, boys and girls were estimated separately for each model.

### **Estimating models with romantic attraction at Wave I as the predictor**

**Boys.** For boys, results showed there was a significant negative direct relation between maternal support and running away, such that boys who reported higher levels of maternal support were significantly less likely to run away than were boys reporting lower levels of maternal support (see Table 9). In addition, the likelihood of committing either an aggressive or an income offense was greater for boys who reported low maternal support. Finally, the likelihood of committing an income offense was greater for boys who ran away than it was for boys who did not run away.

The indirect relations hypothesized (e.g., the mediation pathway demonstrating romantic attraction predicting differences in maternal support affecting the likelihood of running away that causes differences in offending) were not observed for models in which romantic attraction at Wave I was used as the predictor (see Table 10).

The partial  $R^2$  values obtained for this model showed that for boys, maternal support explained 9% of the variance in predicting the outcomes (i.e., aggressive and income offending) above and beyond all other predictors (i.e., romantic attraction, running away, and covariates), that 7% of the variance in predicting the outcomes above all other predictors (i.e., romantic attraction, maternal support, and covariates) was explained by running away, and that less than 1% of the variance in predicting the outcomes above all other predictors was explained by romantic attraction at Wave I (see Table 11).

**Girls.** Similar to boys, the likelihood of running away was significantly greater for girls who reported higher levels of maternal support than it was for girls who reported lower levels of maternal support (see Table 9). Additionally, girls who reported lower levels of maternal support committed significantly more types of aggressive and income offenses than

did girls who reported high maternal support. Furthermore, girls who ran away committed significantly more types of income offenses than did girls who did not run away. Also similar to boys, the indirect relations hypothesized were not significant for models in which romantic attraction at Wave I was the predictor (see Table 10).

Finally, the partial  $R^2$  values obtained for this model showed that for girls, maternal support explained 11% of the variance in predicting the outcomes (i.e., aggressive and income offending) above and beyond all other predictors (i.e., romantic attraction, running away, and covariates), that 14% of the variance in predicting the outcomes above all other predictors (i.e., romantic attraction, maternal support, and covariates) was explained by running away, and that 1% of the variance in predicting the outcomes above all other predictors was explained by romantic attraction (see Table 11).

#### **Estimating models with sexual identity at Wave III as the predictor**

**Boys.** For boys, reporting at least some bisexual identity at Wave III was associated with committing significantly more types of income, but not aggressive, offenses (see Table 12). Furthermore, boys who reported lower levels of maternal support committed significantly more types of both aggressive and income offenses than did boys who reported lower levels of maternal support. Results also showed that boys who ran away committed significantly more types of aggressive and income offenses than did boys who did not run away. Boys who reported lower maternal support were significantly more likely to run away than were boys who reported higher levels of maternal support. The indirect relations hypothesized (e.g., the mediation pathway demonstrating sexual identity predicting differences in maternal support affecting the likelihood of running away that causes

differences in offending) were not observed for models in which sexual identity at Wave III (see Table 13).

Finally, the partial  $R^2$  values obtained for this model showed that for boys, maternal support explained 9% of the variance in predicting the outcomes (i.e., aggressive and income offending) above and beyond all other predictors (i.e., sexual identity, running away, and covariates), that 7% of the variance in predicting the outcomes above all other predictors (i.e., sexual identity, maternal support, and covariates) was explained by running away, and that sexual identity explained less than 1% of the variance in predicting the outcomes above all other predictors (see Table 11).

***Girls.*** For girls, sexual identity at Wave III was related to maternal support, such that girls who reported at least some bisexual identity also reported receiving significantly less maternal support than did heterosexual girls (see Table 12). Girls who reported a bisexual identity also committed significantly more aggressive and income offenses, reported lower maternal support and were more likely to run away, than were heterosexual girls. Finally, girls who reported less maternal support were significantly more likely to run away than were girls who reported higher levels of maternal support.

There were significant indirect effects observed for girls when sexual identity at Wave III was used as a predictor (see Table 13). Specifically, the first significant indirect path showed that girls who reported at least some bisexual identity at Wave III also reported significantly less maternal support, which in turn was associated with an increased likelihood of committing an aggressive or income offense. The second significant indirect path showed that girls who reported having at least some bisexual identity also reported receiving significantly less maternal support, which was associated with a significantly higher likelihood

they would run away, which in turn increased the likelihood that they commit an aggressive or income offense.

Finally, the partial  $R^2$  values obtained for this model showed that for girls, maternal support explained 11% of the variance in predicting the outcomes (i.e., aggressive and income offending) above and beyond all other predictors (i.e., sexual identity, running away, and covariates), that 14% of the variance in predicting the outcomes above all other predictors (i.e., sexual identity, maternal support, and covariates) was explained by running away, and that 3% of the variance in predicting the outcomes above all other predictors was explained by sexual identity (see Table 11).

## DISCUSSION

The current study expands on previous literature by providing the first test of the possible mechanisms responsible for differences in offending between bisexual and heterosexual adolescents. This study hypothesized that bisexual adolescents, due to their status as a sexual minority, would receive less maternal support than would heterosexual adolescents, thus making it more likely that they would run away from home. The economic challenges of running away would then result in bisexual adolescents committing a significantly greater variety of income, but not aggressive, offenses.

To thoroughly test the hypothesized direct and indirect relations, the current study used two indicators of sexual orientation measured at different time points (i.e., romantic attraction at Wave I and sexual identity at Wave III), as well as estimated the models separately for boys and girls. Moreover, given the zero-inflated nature of the outcome variables, this study utilized an analytic method that modeled the offending outcome variables in two ways (i.e., variety of offenses committed and the likelihood of committing

an offense). Given the complicated nature of the analyses, the following discussion of this study's findings is presented in two parts. First, I discuss support for the model of indirect effects, as well as offer reasons why differences in the operationalization of certain variables resulted in differences in findings. Next, I discuss the findings for each of the individual hypothesized direct effects.

Results showed support for the overall mediation model for girls, but only when using sexual identity at Wave III as the sexual orientation indicator and only when predicting the likelihood of committing an offense. The significant indirect pathways observed in this study suggests that girls who identified as bisexual in young adulthood had received less support from their mothers, which made them more likely to run away, and thus they were significantly more likely to commit an offense, and this is true for both aggressive and income offending. This indirect effect was not significant for girls when using romantic attraction in early adolescence as the indicator, for boys when using either sexual orientation indicator, nor for predicting the variety of offenses committed (rather than the likelihood of offending). In addition, contrary to the original hypotheses, the significant indirect effect observed was true for both types of offending, such that there was an increased likelihood that these girls would commit both an income-related and an aggression-based offense. These results suggest that the effects of sexual identity do not operate similarly for boys (i.e., the pathway to offending for boys does not operate through maternal support and running away).

### **Discussion of Global Trends Observed in the Results**

The fact that one of the girls' models resulted in significant individual direct relations, as well as a significant overall mediation model, suggests support for the

hypothesized model proposed by this study. However, that the findings were not robust across models suggests that the way in which the variables were operationalized matters. First, this study found significant effects only when testing for differences in the likelihood of offending, but not for differences in the variety of offenses committed. I originally hypothesized that bisexual adolescents would show a significantly higher variety of income offenses than would heterosexual adolescents, yet none of the models estimated yielded significant differences in offending variety by sexual orientation. The failure to find significant effects using the offending variety score, as opposed to rate of offending, may be due to the variety score being a less sensitive indicator of offending. For example, the variety scores observed in the current dataset produced a low mean and showed little variability. Rates of offending may have instead shown greater variability, thus increasing the likelihood of detecting differences between the groups. In theory, this is a reasonable assumption when taking into account the possible motivations for certain offending activities. For example, a runaway adolescent who must now take on the essential task of feeding him/herself may choose to accomplish this goal through theft (e.g., of food or money). If successful, the adolescent may never find the need to employ alternative methods (e.g., prostituting oneself for money) because his/her needs are being met through continuous theft. In this case, the rate of offending may be high, while the variability in offending would remain low.

Another possible explanation for the lack of significant differences in offending variety may be that there is simply an overall lack of offending in the general adolescent population. Add Health is a community-based sample and is intended to be nationally representative. Less than 30% of adolescents in the current subsample committed an offense in the year before Wave II data collection, which is similar to rates found in comparable

studies such as the Denver Youth Study (Huizinga, Weiher, Menard, Espiritu, Esbensen, 1998) or the Pittsburgh Youth Study (Browning & Loeber, 1999), which found rates of offending between 13-41% (depending on the seriousness of offense). In the current sample, even when excluding participants reporting zero offending behaviors, the average number of different types of offenses committed was only two offenses. It may be that the Add Health dataset, although ideal for answering many research questions on adolescent development, is less suitable for this study's hypotheses than one drawn from a more high-risk context. Another reason for the low variability in offending variety scores may be that not all offending behaviors measured by Add Health were used in the current study. Instead, items were chosen based on an unambiguous categorization as either an aggressive- or income-based offense. This meant that some offenses (e.g., status crimes like truancy or substance use) were not included in either offense category, thereby decreasing the amount of offending found in this subsample.

The second identifiable trend in the results was that significant findings depended on which sexual orientation indicator was used. Indeed, results showed that when romantic attraction at Wave I was used to represent sexual orientation, there were no significant direct effects between romantic attraction and any other study variable, for boys or girls. Furthermore, neither the overall hypothesized mediation model, nor the indirect pathways tested, were significant when romantic attraction at Wave I was the predictor. Significant direct pathways from sexual orientation indicator to other study variables, as well as the hypothesized indirect pathways, were observed only for models in which sexual identity at Wave III was used as the predictor. This inconsistency in findings based on the sexual orientation indicator seems to mirror a lack of consistency in participant reports of sexuality



from Wave I and Wave III, which has already been addressed by researchers, using the Add Health dataset (see, e.g., Savin-Williams & Joyner, 2014a; Savin-Williams & Joyner, 2014b, Li et al., 2014; Katz-Wise et al., 2015). For example, Savin-Williams and Joyner (2014a) published an attempt to empirically assess the fluctuations in sexual preferences between the various waves of Add Health data collection. The authors found that over 70% of participants (mainly boys) who reported both- or same-sex attractions at Wave I later reported exclusive heterosexuality at Wave IV. These authors concluded that the inconsistencies were the result of heterosexual boys who either (1) were confused about the concept of "romantic attraction" or (2) were "tricksters" who claimed, in jest, to have an attraction to males at Wave I, only to respond accurately in Waves III and IV (Savin-Williams & Joyner, 2014a). This interpretation, if correct, questions the validity of any study that used the Wave I indicator of sexual orientation.

However, Li and colleagues (2014) challenged the interpretation set forth by Savin-Williams and Joyner, arguing that the latter's explanation was misguided, possibly due to questionable methodology. Li and colleagues made a strong case for the explanation offered, but rejected, by Savin-Williams and Joyner, which stated that boys who reported non-heterosexual attraction in the earlier waves, then became "re-closeted," and thus were reporting exclusively heterosexual attractions and identities by Waves III and IV. The authors suggest that the internalization of negative stigmatization of same-sex attraction became increasingly noticeable as the boys aged, and as a protective response these boys went back into the closet. However, a consensus has not been reached.

Although inconsistency in sexual orientation may explain differences in results between sexual orientation indicators, there is still a need for additional research into the

most appropriate way to assess sexual orientation. It may be that in the Add Health dataset, measuring sexual orientation as it emerges in early adolescence is best (i.e., at Wave I). It may be that it is best measured in young adulthood once it is resolved (i.e., at Wave III). Or it may be that both or neither accurately measures the construct of sexual orientation (instead measuring some other aspect[s] of sexuality altogether).

Current best practices recommend asking three questions to assess sexual orientation, each assessing one facet of the construct (Sexual Minority Assessment Research Team [SMART], 2009; Redford & Van Wagenen, 2012; Wolff et al., 2017). The first question should assess sexual attraction (i.e., the sex or gender of the person to whom an individual feels a sexual attraction). The second should assess the participant's sexual behavior (i.e., the sex or gender of those with whom the participant engages in sexual activity, which may differ from the sex/gender to whom the individual is sexually attracted). The third should assess sexual self-identification (i.e., an individual's conception of their sexual orientation; SMART, 2009).<sup>10</sup>

Many investigators are hesitant to include all three measures of sexual orientation in the same study because they feel it imposes a significant burden on participants (SMART, 2009; Sell, Kates, & Brodie, 2007; Wolff et al., 2017). The APA acknowledged this in a 2016 resolution, stating a recognition that gathering data on sexual orientation may cause discomfort for respondents and that asking more than one question may cause such discomfort as to cause nonresponse to all questions on sex/sexual orientation (APA, 2016). However, the APA still recommends that psychological research studies include measures of

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<sup>10</sup> The final question is believed to be especially useful for participants who are not sexually active, as well as individuals who may identify themselves as being exclusively heterosexual or gay/lesbian, yet still hold some level of attraction for the same- or opposite-sex, respectively (SMART, 2009).

sexual orientation and gender identity that follow evidence-based best practices (APA, 2016). Researchers who still feel the risk of missing data on sexual orientation measures due to discomfort, yet still want to follow the APA's resolution, may choose to measure only the dimension that seems most relevant to their particular study goals (SMART, 2009; Wolff et al., 2017). For example, the first question (attraction) may be of best use when assessing the psychological and developmental outcomes of sexual minorities in public health studies. The second question (behavior) would be most useful for exploring topics related to sexual health, and the third question (identity) may be most useful when studying social, political and economic issues related to sexual orientation (SMART, 2009; Wolff et al., 2017).

Finally, results for the current study also varied by gender. Gender was initially tested in an exploratory manner and results confirm that estimating the models separately for boys and girls was appropriate. As previously stated, there were more significant direct effects for the girls' model than there were for the boys' model, as well as there being significant indirect effects for the girls' model that were not observed for boys. However, the girls' model did not produce any significant indirect effects when romantic attraction at Wave I was the predictor. One possible explanation for the gender difference here may simply be that there were significantly more bisexual girls at Wave III than at Wave I, and more bisexual girls at Wave III than there were bisexual boys at either Waves I or III. Therefore, the power to detect differences is greatest for the girls' model using the Wave III indicator, thus making it more likely there would be significant effects.

Previous research suggests other reasons for the gender differences observed by this study. Research has shown that physical and sexual abuse in the home happens more often for girls and is much more likely to be a precipitating factor in offending than it is for boys

(Herrera & McCloskey, 2003). Daughters of mothers who are unable/unwilling to protect their daughters from abuse or who are perpetuating the abuse, would likely report their mothers to be unsupportive. The less supported these girls feel, the more likely they are to run away from home, thus putting them at risk for offending. The desire to escape physical and sexual abuse in the home would also predict increased incidences of running away, even without the mediating effect of maternal support. Data on child abuse shows a large disparity among bisexual and heterosexual females in reported experiences of abuse in the home. The exact mechanism(s) for these findings remains unknown. However, previous research into attitudes about sexual minorities may help explain this increased risk for bisexual girls (Friedman et al., 2011). Indeed, in a study of heterosexuals' attitudes towards bisexuals, Herek (2002) found that heterosexual women rated bisexual women significantly less favorably than both heterosexual and lesbian women. It may be that these unfavorable attitudes, specifically towards bisexual women, cause an even greater withdrawal of support.

However, the mechanisms that underlie these negative attitudes towards bisexual individuals are unknown. One reason may be related to the lack of understanding that persists about bisexuality, which is greater than the lack of understanding our culture has for gays/lesbians. It may be that the concept of bisexuality is much less understood than that of homosexuality. Absent this understanding, many are left to fill in the gaps in their knowledge, most likely with misinformation, which in turn may foster negative evaluations of this group (Herek, 2002). For example, there is a commonality between both heterosexual and gay/lesbian persons which appears to increase one's understanding of the other, in that they are sexually and romantically attracted to one gender and have an aversion to the other. Confusion as to how a bisexual person can share their attraction preferences, yet not share in

their aversions, could cause confusion in either group (Klein, 1993). These ideas may lead to beliefs that bisexuals are in opposition to monogamy or merely indecisive, both which threaten traditional values related to romantic relationships in our society.

### **Discussion of Findings for Individual Direct Effects**

In addition to the mediation model and indirect pathways, there were significant direct relations among the study variables. Findings inconsistent with the original hypotheses may have explanations similar to those listed in the previous section (e.g., problems in the measurement and conceptualization of sexual orientation, lack of variability in offending in current sample, etc.). However, there are also explanations that are unique to each specific hypothesized direct pathway.

**The link between sexual orientation and maternal support.** Consistent with previous research, the current study found evidence that bisexual adolescents received significantly less support from their mothers than did heterosexual adolescents (see, e.g., D'Augelli et al., 2005). Specifically, girls who identified as bisexual in Wave III reported receiving significantly lower levels of maternal support than did girls who identified as heterosexual at Wave III. However, this pathway was not significant for girls in models using romantic attraction at Wave I as the indicator of sexual orientation, nor was it significant for boys when using either the Wave I or the Wave III indicator.

One reason for the lack of a significant relation between boys' sexual orientation and material support might be that mothers are less likely to know or guess their sons' sexual orientation than are mothers of daughters. Previous research has suggested that problematic parent-GLB child relationships can be caused by adolescent nonheterosexuality, even when explicit disclosure has not occurred. This awareness sometimes comes in the form of the

child not fitting stereotypical gender roles. However, this ability for a parent to pick up on certain characteristics that would indicate nonheterosexuality may be more difficult when the child is bisexual instead of gay/lesbian (Saewyc, 2011). There are many reasons why bisexual adolescents may be at less risk of being “outed.” For example, the adolescents who desires to remain in the closet may avoid arousing unwanted suspicion by showing parents only the parts of their lives that would promote a heterosexual identity. For example, a young bisexual male who brings home a guest for whom he has a romantic attraction may act different depending on the gender of the individual. When the guest is female, he may present her as his date or girlfriend, but when the romantic interest is male, then the boy is "just a friend." This type of behavior could also dismiss any fears or suspicions the parent may have about their child's sexual orientation, thus reinforcing the belief that their child is heterosexual. Moreover, boys may simply be better at, or more concerned with, keeping up the appearance of heterosexuality. If true, this may support Li and colleagues (2014) explanation of the inconsistency of reported sexual orientation in the Add Health dataset (i.e., that boys who reported a romantic attraction to boys went back into the closet in later Waves, as they felt pressure from society to be heterosexual).

Alternatively, this relation may have been significant for females, but not for males, due to biological differences in development among girls and boys that occur during adolescence. For example, pubertal timing for girls typically occurs years earlier than it does for boys (around 10 years of age for girls versus 12 years of age for boys; American Medical Association [AMA], 2013), likely resulting in sex and sexuality being a concern sooner for girls than for boys. Given the average age of Wave I's sample ( $M=15.8$  years), it may be that

the males in this sample are not yet expressing aspects of their nonheterosexuality their mothers can detect.

**The link between maternal support and running away.** The findings from the current study support the hypothesized relation between maternal support and running away. This relation was significant for both boys and girls and was significant for both the model using romantic attraction as the predictor, as well as the model in which sexual identity was used as the predictor. However, a limitation of the current study is the lack of temporal precedence for these findings, such that the directionality of this relation cannot be confirmed. Although it would be preferable to have these variables assessed at separate time points, limitations in the dataset that prevented this (e.g., the current study's outcome variables required being measured at Wave II in order to best capture what would be considered "delinquent" behavior). Additionally, the relation between these two variables could be the result of an untested third variable. For example, an abusive home would increase the chances of both lower adolescent perceptions of maternal support and the chances the adolescent runs away from home. However, this assumption that lower maternal support influences the likelihood of running away would be consistent with a large body of research (Safyer et al., 2004; Tucker et al., 2011; Tyler & Bersani, 2008).

**The link between running away and offense variety.** Findings from the current study did not support the hypothesized relation in which running away predicted a significantly higher variety of offenses committed. The lack of a significant relation was observed for all tested models, despite the differences in models on sexual orientation indicator, gender, and offense category. The lack of a significant relation between running away and the variety of offenses committed appears to contradict what previous research has

consistently shown, which is that living outside of the home increases the risk of adverse emotional and behavioral outcomes, especially offending (see, e.g., Thompson, 2005; Tucker et al., 2011, Tyler & Johnson, 2006).

One reason for the inability of this study to observe a significant relation between running away and offending may be that the variable chosen to represent running away does not best represent the construct in the desired way. It may be that adverse outcomes are more likely to be seen in adolescents who are away from home for extended periods of time (i.e., more than one night). The Add Health measure of running away does not specify how many nights the adolescent spent out of the home, nor does it specify where the child spent that time, both which would affect subsequent behaviors. A variable that assessed these qualities would allow for further investigation into this relation.

**The link between running away and the likelihood of offending.** Although running away did not predict an increase in the number of different income or aggressive offenses committed, it did predict the likelihood that an adolescent would or would not commit an offense. The likelihood of committing an income offense was significantly higher for both boys and girls who ran away from home than it was for boys and girls who did not run away from home, and this finding was true for both the Wave I and Wave III models. Also, in the Wave III model, girls who ran away from home were at significantly greater risk for committing an aggressive offense than girls who did not. These findings are consistent with previous research showing an increased likelihood of a runaway adolescent being arrested for any offense (Pagare et al., 2004). However, the relation between running away and aggressive offending was not significant for boys for the model in which sexual identity at Wave III was used as the predictor, nor was it significant for boys or girls for the model in



which romantic attraction at Wave I was used as the predictor variable. The reasons for this lack of a significant relation could be in part due to the reasons stated for the lack of relation between running away and offense variety.

### **Explaining Significant Direct Relations without Significant Indirect Effects**

Finally, further attention should be given to the comparison between the boys' and girls' models that used sexual identity at Wave III as the predictor. Although the girls' model showed significant indirect effects, the corresponding boys' model did not show significant indirect effects, despite a significant direct effect of sexual identity on the likelihood of committing an aggressive offense. The absence of significant differences between heterosexual and bisexual boys may be explained if mothers are more unaccepting of bisexuality in women (i.e., their daughters). If true, this would suggest the relations between maternal support, running away, and offending remain significant, but are not dependent on boys' sexual orientation. Although high maternal support likely signifies a positive home environment, bisexual boys may still encounter issues in other environmental contexts due to their sexual orientation. For example, bisexual boys may be significantly more likely to commit aggressive offenses than are heterosexual boys because they are involved in physical altercations in which they are required to defend themselves. Indeed, one study found that the number of male sexual partners was positively correlated with a higher frequency of use of violence (DuRant, Krowchuk, & Sinal, 1998). However, current research on bullying outcomes for gay adolescent boys focuses heavily on internalizing symptomatology (e.g., depression, loneliness, and suicide ideation; Berlan, Corliss, Field, Goodman, & Austin, 2010; Russell, Franz, & Driscoll, 2001; Young & Sweeting, 2004) and not on adverse externalizing behaviors.

## **Implications**

Results from this study suggest that the hypothesized relations exist, but only for particular operationalizations of variables and more strongly for girls than for boys. This suggests that the pathway for offending for bisexual girls is different from that of bisexual boys and operates as I hypothesized. Successfully interrupting the pathway from bisexuality to offending may be achieved when prevention or intervention efforts focus on improving the mother-daughter relationship between bisexual girls and their mothers. Effective ways of achieving this goal could include efforts to help educate mothers, either individually or in a group setting, not only about bisexuality and what it means to have a bisexual orientation, but also taking care to debunk harmful myths (e.g., that they can change their child's sexual orientation or force their child to be heterosexual), as well as correcting other negative or prejudicial beliefs that these mothers may hold about bisexual persons (e.g., bisexual individuals are more promiscuous than are heterosexual individuals). These lessons would also go beyond simply understanding bisexuality and would aim to promote a greater understanding of several aspects of sexual orientation, including what we have learned through research about attraction and behaviors.

One program currently being offered to achieve these goals is the Family Acceptance Project (Ryan, 2010). Although this program has yet to publish any findings on the effectiveness of this intervention for families of sexual minority youth, there exists a wealth of empirical validation on the effectiveness of parent-focused interventions (e.g., programs focused on improving parental monitoring techniques or those that aim to educate parents on their child's social/emotional competence) at reducing a child's antisocial and delinquent behavior.

Overall, findings from studies on human and psychological development, such as this one, should inform the way we respond to juvenile offenders on a much larger scale. The current study warrants consideration by policymakers, who can affect system-wide juvenile justice reform. Indeed, the juvenile justice system does not require that operationalized or rigid standards are followed, nor is it required to disregard individualized care and rehabilitation, making it an ideal institution for reform through policymaking. This is due to the role judges in the juvenile justice system are allowed to occupy, which is unlike that of the adult criminal justice system. Juvenile court judges are granted freedoms unavailable to adult criminal court judges that grant them the ability to consider the individual circumstances that may have predisposed bisexual adolescents to offending. Providing the court with an understanding of the unique risk factors for GLB adolescents may result in these adolescents receiving dispositions from the court aimed at ameliorating and correcting the problematic conditions that put these youth at an increased risk of offending.

Finally, this study adds to existing research on bisexuality, specifically in adolescence, an understudied group for which information is currently lacking in the research literature. The hope is that the identification and dissemination of these findings will lead to increased efforts to treat bisexual individuals as a group distinct from both heterosexuality and homosexuality in research. The implication suggested by this study, that the differences between these groups are underestimated, should play a role in shifting how we conceptualize non-heterosexuality, as well as support the move away from a dichotomous categorization of sexual orientation.

## **Limitations and Future Directions**

There are several limitations of the current study that should be noted. First, this study only compared heterosexual and bisexual adolescents. It would have been preferable to include a third group representing those who held a strictly gay/lesbian attraction or identity so as to compare gay/lesbian adolescents to both heterosexual and bisexual adolescents. However, so few individuals in the current dataset were only attracted to individuals of the same sex or identified as solely homosexual ( $n < 100$ ). Future studies on childhood/adolescence should consider oversampling sexual minority individuals (similar to the way in which Add Health oversampled other understudied minority groups) so that comparisons between these three groups are feasible.

Sufficient sampling of sexual minority individuals requires there be a valid and reliable measure of sexual orientation. As previously discussed in this dataset, there remains a lack of consensus in explaining the inconsistency between romantic attraction responses at Waves I/II and sexual identity responses at Waves III/IV. Thus, it is important that attempts to research sexual minority individuals in the future establish and follow the standard for reliable and valid measurement.

Third, the ability to answer the current study's research questions were temporally limited. Participants of the Add Health study were 13-21 years of age at Wave I, 14-22 years of age at Wave II, 18-26 years of age at Wave III. To best capture the delinquency construct, it was decided that the outcomes would be measured when the participant was 19 years of age or younger. Wave III was unsuitable because it would have resulted in a considerable reduction in sample size, as well as increasing the age in which offending could be assessed. Moreover, Wave III measures were specifically designed for adult participants,

and therefore questions on offending were not intended to assess delinquency. Thus, Wave II became the only suitable option for measuring offending outcomes. This meant that only Waves I and II could be used in data analyses, even though three time points (with maternal support at the first time point, running away at the second, and offending at the third) would have been ideal.

### **Summary and Conclusions**

The current study provides new insight into the developmental risk pathway between sexual orientation and offending behaviors in adolescence. This study found evidence that levels of maternal support and the likelihood of running away from home are mechanisms affected by adolescent bisexuality, as well as factors that affect the likelihood of offending. In addition, this pathway seems to operate mostly for adolescent girls. The results from the current study support the necessity for bisexual persons to be studied separately from gay/lesbian persons and highlight the necessity of best practices in measuring sexual orientation, as well as may enhance prevention and intervention efforts to decrease adolescent offending.

Table 1

*Descriptive Statistics for Study Variables for Add Health Subsample*

Variable		Full Subsample					Boys	Girls
<i>Dichotomous</i>		%					%	
Romantic attraction <sup>a</sup> (♀)	-	-	4.5%	-	-	5.8%**	3.4%	
Sexual identity <sup>b</sup> (♀)	-	-	9.7%	-	-	5.1%**	13.8%	
Race <sup>a</sup>	{ White Black Hispanic Other	-	-	54.0%	-	-	53.8%	54.0%
		-	-	19.4%	-	-	18.2%**	20.4%
		-	-	14.4%	-	-	15.2%*	13.7%
		-	-	12.2%	-	-	12.8%	11.9%
Ran away <sup>ac</sup>	-	-	7.4%	-	-	6.2%**	8.5%	
<i>Continuous/Count</i>		<i>Min.</i>	<i>Max.</i>	<i>Mean (SE)</i>	<i>Skewness</i>	<i>Kurtosis</i>	<i>Mean (SE)</i>	
Age <sup>a</sup>	12	19	15.8 (1.56)	0.12 (0.24)	-0.83 (0.50)	15.9 (1.56)**	15.7 (1.56)	
Aggressive offenses <sup>ac</sup>	0	7	1.00 (1.38)	1.65 (0.02)	2.72 (0.05)	1.34 (1.55)**	0.70 (1.15)	
Income offenses <sup>ac</sup>	0	6	0.64 (1.09)	1.77 (0.02)	2.62 (0.05)	0.78 (1.21)**	0.51 (0.97)	
Maternal support <sup>a</sup>	1	5	4.53 (0.58)	-1.85 (0.02)	4.25 (0.05)	4.59 (0.49)**	4.47 (0.64)	
Aggressive offenses <sup>de</sup>	0	7	0.66 (1.21)	2.34 (0.02)	5.92 (0.05)	0.91 (1.40)**	0.45 (0.96)	
Income offenses <sup>de</sup>	0	6	0.51 (1.02)	2.16 (0.02)	2.47 (0.05)	0.63 (1.13)**	0.43 (0.91)	

*Note.* Full subsample: N = 10,542, boys: n = 4,936, girls: n = 5,606. Asterisks represent significant differences derived from results of t-tests or chi-squares tests comparing boys and girls. ♀ = Values represent percentage of participants who reported some form of bisexuality.

<sup>a</sup>Measured at Wave I. <sup>b</sup>Measured at Wave III. <sup>c</sup>0 = Did not run away, 1 = Ran away one or more times. <sup>d</sup>Past year measured at Wave II. <sup>e</sup>refers to the number of different types (or variety) of offenses committed.

\*p ≤ 0.05 \*\*p ≤ 0.01

Table 2

*Intercorrelations among Maternal Support Indicators*

<b>Item</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1. Closeness	1	-	-	-
2. Caring	0.50**	1	-	-
3. Warmth	0.48**	0.41**	1	-
4. Satisfaction	0.60**	0.39**	0.60**	1

*Note.* Closeness = how close participant felt to mom; Caring = how much the participant felt his/her mom cared about him/her; Warmth = how much of the time participant felt mom was warm and loving towards him/her; Satisfaction = how satisfied participant was with relationship with his/her mom.

\* $p \leq 0.05$ , \*\* $p \leq 0.01$ .

Table 3

*Unstandardized and Standardized Coefficients for CFA of Maternal Support Variable*

<b>Item</b>	<b>Unstandardized (S.E.)</b>	<b>Standardized</b>	<b>p-value</b>
Closeness	1.00 (—)	0.79	—
Caring	0.93 (0.01)	0.83	< 0.00
Warmth	0.92 (0.01)	0.85	< 0.00
Satisfaction	0.98 (0.01)	0.79	< 0.00

*Note.* CFA = confirmatory factor analysis. Dashes (—) indicate that the value was not estimated.



Table 4

*Goodness-of-Fit Indicators for Maternal Support Latent Construct*

<b>Fit Indicator</b>	<b>Value</b>	<b>“Cut-off” Value<sup>a</sup></b>	<b>Fit Determination</b>
$\chi^2(df)$	876.4 (2)***	$p \leq 0.05$	Good
Comparative Fit Index (CFI)	0.98	$\geq 0.95$	Good
Tucker-Lewis Index (TLI)	0.95	$\geq 0.95$	Good
Root Mean Square of Approximation (RMSEA)	0.15 <sup>b</sup>	$< 0.08$	Acceptable <sup>c</sup>

*Note.* <sup>a</sup>Values considered to be indicative of “good” fit (obtained from Hu & Bentler, 2009). <sup>b</sup>90% CI [0.142, 0.168]. <sup>c</sup>Cutoff RMSEA values have been shown to falsely indicate poor model fit when degrees of freedom are small; however, typically seen in addition to a small sample size (Kenny, Kaniskan, & McCoach, 2014).  
\*\*\* $p \leq 0.01$ .

Table 5

*Zero-order Correlations among Study Variables (boys)*

Measure	1	2	3	4	5	6	7	8	9	10	11	12
1. Romantic attraction <sup>ab</sup>	1											
2. Sexual identity <sup>ac</sup>	.061**	1										
3. Age <sup>b</sup>	.004	.003	1									
4. Black <sup>bd</sup>	.020	-.027	-.034*	1								
5. Hispanic <sup>bd</sup>	.003	.032*	.068**	-.200**	1							
6. Other <sup>bd</sup>	-.020	-.008	.042**	-.181**	-.162**	1						
7. Aggressive offending <sup>b</sup>	.007	-.037*	.028*	.038**	.041**	.018	1					
8. Income offending <sup>b</sup>	-.009	.008	.061**	-.039**	.047**	.033*	.502**	1				
9. Maternal support <sup>bc</sup>	-.014	.000	-.160**	.059**	.018	-.028	-.114**	-.142**	1			
10. Ran away <sup>bf</sup>	.020*	.007	.022	-.011	.007	.005	.239**	.239**	-.148**	1		
11. Aggressive offending <sup>g</sup>	.038**	-.037*	-.009	-.002	.072**	.003	.496**	.294**	-.071**	.123**	1	
12. Income offending <sup>g</sup>	.007	-.006	-.001	-.028	.034*	.025	.319**	.453**	-.094**	.116**	.452**	1

*Note.* <sup>a</sup>0 = attracted to opposite sex only, 1 = attracted to both sexes. <sup>b</sup>Measured at Wave I. <sup>c</sup>Measured at Wave III. <sup>d</sup>Represents comparison to grand mean.

<sup>e</sup>Variety score. <sup>f</sup>Higher values indicate higher levels of maternal support. <sup>g</sup>0 = Did not run away, 1 = Ran away one or more times. <sup>h</sup>Measured at Wave II.

\* $p \leq 0.05$ ; \*\* $p \leq 0.01$

Table 6

*Zero-order Correlations among Study Variables (girls)*

<b>Measure</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
1. Romantic attraction <sup>ab</sup>	1											
2. Sexual identity <sup>ac</sup>	.133**	1										
3. Age <sup>b</sup>	.063**	-.020	1									
4. Black <sup>bd</sup>	-.020	-.060**	-.003	1								
5. Hispanic <sup>bd</sup>	.043**	-.004	.076**	-.202**	1							
6. Other <sup>bd</sup>	.020	-.002	.054**	-.186**	-.146**	1						
7. Aggressive offending <sup>be</sup>	.047**	.084**	-.089**	.086**	.048**	.041**	1					
8. Income offending <sup>be</sup>	.098**	.138**	.010	-.055**	.074**	.057**	.400**	1				
9. Maternal support <sup>bf</sup>	-.030*	-.109**	-.123**	.010	-.030*	-.050**	-.168**	-.207**	1			
10. Ran away <sup>bg</sup>	.057**	.071**	.070**	-.031*	.049**	.032*	.272**	.269**	-.195**	1		
11. Aggressive offending <sup>eg</sup>	.035**	.069**	-.098**	.055**	.037**	.011	.509**	.266**	-.102**	.184**	1	
12. Income offending <sup>eg</sup>	.039**	.142**	-.070**	-.060**	.027*	.043**	.276**	.490**	-.131**	.172**	.355**	1

*Note.* <sup>a</sup>0 = attracted to opposite sex only, 1 = attracted to both sexes. <sup>b</sup>Measured at Wave I. <sup>c</sup>Measured at Wave III. <sup>d</sup>Represents comparison to grand mean. <sup>e</sup>Variety score. <sup>f</sup>Higher values indicate higher levels of maternal support. <sup>g</sup>0 = Did not run away, 1 = Ran away one or more times. <sup>h</sup>Measured at Wave II. \* $p \leq 0.05$ ; \*\* $p \leq 0.01$

Table 7

*Chi-square Difference Values and Fit Statistics for Models with Romantic Attraction (Wave I) as Predictor*

<b>Path(s) constrained to equality for males and females</b>	<b>Log likelihood</b>	<b># of free paths<sup>a</sup></b>	<b>TR<sub>d</sub><sup>b</sup> (df)</b>	<b>AIC</b>	<b>BIC</b>	<b>ABIC</b>
None (all free)	-52,119.88	127	-	104,493.75	105,413.54	105,009.95
Romantic attraction predicting maternal support	-52,119.93	126	0.10 ( <i>t</i> )	104,491.87	105,404.41	105,004.00
+ Romantic attraction predicting running away	-52,120.28	125	0.46 ( <i>t</i> )	104,490.57	105,395.87	104,998.64
+ Maternal support predicting running away	-52,121.42	124	1.98 ( <i>t</i> )	104,490.85	105,388.91	104,994.85
All (none free)	-52,138.53	112	27.3 (12)**	104,501.05	105,312.21	104,956.28

*Note.* Each additional path is additive to the preceding path. “All” paths include the following additional pathways (per gender): sexual orientation indicator predicting aggressive and income offending (2 paths), maternal support predicting aggressive and income offending (2 paths) and ran away predicting aggressive and income offending (2 paths), but does not include paths between covariates and predictor, mediator or outcome variables. TR<sub>d</sub> = Satorra-Bentler scaled chi-square difference test. AIC = Akaike information criterion. BIC = Bayesian information criterion. ABIC = Adjusted Bayesian information criterion.

<sup>a</sup>Total number of paths/parameters in model = 127. <sup>b</sup>Reflects chi-square difference in model fit when compared to previously listed model.

\*p ≤ 0.05, \*\*p ≤ 0.01.

Table 8

*Chi-square Difference Values and Fit Statistics for Models with Sexual Identity (Wave III) as Predictor*

<b>Path(s) constrained to equality for males and females</b>	<b>Log likelihood</b>	<b># of free paths<sup>a</sup></b>	<b>TR<sub>d</sub><sup>b</sup> (df)</b>	<b>AIC</b>	<b>BIC</b>	<b>ABIC</b>
None (all free)	-55,626.47	127	-	111,506.93	112,426.72	112,023.13
Sexual identity predicting maternal support	-55,632.36	126	12.4 (1)**	111,516.72	112,429.27	112,028.86
+ Sexual identity predicting running away	-55,632.37	125	0.02 (1)	111,514.73	112,420.03	112,022.80
+ Maternal support predicting running away	-55,633.41	124	1.72 (1)	111,514.83	112,412.89	112,018.83
All (none free)	-55,667.28	112	122.6 (12)**	111,558.55	112,369.71	112,013.78

*Note.* Each additional path is additive to the preceding path. “All” paths include the following additional pathways (per gender): sexual orientation indicator predicting aggressive and income offending (2 paths), maternal support predicting aggressive and income offending (2 paths) and ran away predicting aggressive and income offending (2 paths), but does not include paths between covariates and predictor, mediator or outcome variables. TR<sub>d</sub> = Satorra-Bentler scaled chi-square difference test. AIC = Akaike information criterion. BIC = Bayesian information criterion. ABIC = Adjusted Bayesian information criterion.

<sup>a</sup>Total number of paths/parameters in model = 127. <sup>b</sup>Reflects chi-square difference in model fit when compared to previously listed model.

\*p ≤ 0.05, \*\*p ≤ 0.01.

Table 9

*Direct Effects of Exogenous on Endogenous Study Variables for Models with Romantic Attraction (Wave I) as Predictor*

<i>Exogenous</i>		<i>Endogenous</i>		<i>Boys</i>		<i>Girls</i>		
				<i>Est. (S.E.)</i>	<i>Est./S.E.</i>	<i>Est. (S.E.)</i>	<i>Est./S.E.</i>	
Romantic attraction <sup>a</sup>	Maternal support			-0.16 (0.18)	-0.91	-0.06 (0.22)	-0.28	
	Ran away			0.02 (0.02)	1.20	0.04 (0.03)	1.58	
	Offending variety	Aggressive			0.18 (0.10)	1.88*	-0.19 (0.19)	-1.05
		Income			-0.10 (0.13)	-0.71	0.01 (0.12)	0.11
	Likelihood of offending	Aggressive			-0.21 (0.29)	-0.72	-1.07 (0.91)	-1.18
		Income			-0.55 (0.33)	-1.67	0.21 (0.28)	0.77
	Ran away			-0.01 (0.00)	-5.04**	-0.01 (0.00)	-6.53**	
	Maternal support <sup>b</sup>	Offending variety	Aggressive		0.03 (0.02)	1.72	0.03 (0.02)	1.57
Income				0.01 (0.02)	0.77	0.02 (0.01)	1.60	
Likelihood of offending		Aggressive		0.23 (0.04)	5.35**	0.15 (0.03)	4.39**	
		Income		0.21 (0.03)	6.87**	0.16 (0.02)	6.43**	
Ran away <sup>c</sup>	Offending variety	Aggressive		0.02 (0.30)	0.77	0.09 (0.10)	0.90	
		Income		-0.09 (0.08)	-1.12	-0.07 (0.08)	-0.81	
	Likelihood of offending	Aggressive		-0.26 (0.25)	-1.03	-0.47 (0.29)	-1.61	
		Income		-0.59 (0.23)	-2.50**	-0.96 (0.24)	-4.00**	

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*Note.* Est. (S.E.) = unstandardized path coefficient. Est./S.E. = standardized path coefficient (interpreted as a z-score, with values  $\geq 1.95$  sig. at  $p < 0.05$ ).

<sup>a</sup>0 = opposite-sex attraction only, 1 = bisexual attraction; <sup>b</sup>Higher values indicate more maternal support; <sup>c</sup>0 = did not run away, 1 = ran away one or more times.

\* $p \leq 0.05$ ; \*\* $p \leq 0.01$ .

Table 10

*Indirect Effects of Structural Equation Modeling with Romantic Attraction (Wave I) as Predictor*

Outcome Measure	Path/Effect	Boys		Girls		
		<i>Est. (S.E.)</i>	<i>Est./S.E.</i>	<i>Est. (S.E.)</i>	<i>Est./S.E.</i>	
<i>Offending variety</i>	Aggressive	$SO^a \rightarrow MS^b \rightarrow AO^c$	0.00 (0.01)	-0.80	0.00 (0.01)	0.01
		$SO \rightarrow RA^d \rightarrow AO$	0.00 (0.00)	0.29	0.00 (0.01)	0.01
		$SO \rightarrow MS \rightarrow RA \rightarrow AO$	0.00 (0.00)	0.28	0.00 (0.00)	0.00
		<i>Total Indirect Effects</i>	0.00 (0.01)	-0.72	0.00 (0.01)	0.01
	Income	$SO \rightarrow MS \rightarrow IO^e$	0.00 (0.00)	-0.59	0.00 (0.01)	0.01
		$SO \rightarrow RA \rightarrow IO$	0.00 (0.00)	-0.83	0.00 (0.02)	0.00
		$SO \rightarrow MS \rightarrow RA \rightarrow IO$	0.00 (0.00)	-0.70	0.00 (0.00)	0.00
		<i>Total Indirect Effects</i>	0.00 (0.00)	-0.95	0.00 (0.04)	0.01
<i>Likelihood of offending</i>	Aggressive	$SO \rightarrow MS \rightarrow AO$	-0.04 (0.04)	-0.90	-0.01 (0.03)	0.03
		$SO \rightarrow RA \rightarrow AO$	-0.01 (0.01)	-0.78	-0.02 (0.02)	0.02
		$SO \rightarrow MS \rightarrow RA \rightarrow AO$	0.00 (0.00)	-0.67	0.00 (0.00)	0.00
		<i>Total Indirect Effects</i>	-0.04 (0.04)	-1.00	-0.03 (0.04)	0.04
	Income	$SO \rightarrow MS \rightarrow IO$	-0.03 (0.04)	-0.90	-0.01 (0.01)	0.04
		$SO \rightarrow RA \rightarrow IO$	-0.01 (0.01)	-1.08	-0.04 (0.00)	0.03
		$SO \rightarrow MS \rightarrow RA \rightarrow IO$	0.00 (0.00)	-0.85	0.00 (0.00)	0.00
		<i>Total Indirect Effects</i>	-0.05 (0.04)	-1.15	-0.05 (0.01)	0.04

*Note.* SO = Sexual orientation (i.e., romantic attraction at Wave I). <sup>b</sup>Maternal support. <sup>c</sup>Aggressive offending. <sup>d</sup>Ran away. <sup>e</sup>Income offending.

\* $p \leq 0.05$ ; \*\* $p \leq 0.01$ .

Table 11

*Partial R<sup>2</sup> Values Showing Amount of Variance Explained by Each Exogenous Variable in the SEM Models*

<i>Predictor variable Wave</i>	<i>Measure</i>	<b>Boys</b>		<b>Girls</b>	
		<i>Est. (S.E.)</i>	<i>Est./S.E.</i>	<i>Est. (S.E.)</i>	<i>Est./S.E.</i>
Wave I	Romantic attraction	0.00 (0.00)	1.13	0.01 (0.00)	3.52**
	Maternal support	0.09 (0.01)	10.4**	0.11 (0.00)	10.9**
	Ran away	0.07 (0.01)	7.53**	0.14 (0.01)	11.2**
Wave III	Sexual identity	0.00 (0.00)	2.01**	0.03 (0.01)	5.22**
	Maternal support	0.09 (0.01)	10.8**	0.11 (0.01)	11.3**
	Ran away	0.07 (0.01)	7.54**	0.14 (0.01)	11.2**

*Note.* SEM = Structural equation modeling. Variance refers to a measure of the influence of the exogenous variable above and beyond the other exogenous variables used in estimating the model.

\* $p \leq 0.05$ , \*\* $p \leq 0.01$ .



Table 12

*Direct Effects of Exogenous on Endogenous Study Variables for Models with Sexual Identity (Wave III) as Predictor*

<b>Variable</b>		<b>Boys</b>		<b>Girls</b>		
<i>Exogenous</i>	<i>Endogenous</i>	<i>Est. (S.E.)</i>	<i>Est./S.E.</i>	<i>Est. (S.E.)</i>	<i>Est./S.E.</i>	
Sexual identity <sup>a</sup>	Maternal support	0.06 (0.20)	0.30	-0.74 (0.12)	-5.99**	
	Ran away	0.02 (0.02)	0.94	0.02 (0.01)	1.20	
	Offending variety	Aggressive	-0.03 (0.12)	-0.24	-0.19 (0.19)	-1.05
		Income	-0.12 (0.13)	-0.89	-0.11 (0.09)	-1.22
	Likelihood of offending	Aggressive	0.58 (0.27)	2.17*	-1.11 (0.38)	-2.93**
		Income	-0.30 (0.32)	-0.96	-0.64 (0.18)	-3.59**
	Ran away		-0.01 (0.00)	-5.05**	-0.01 (0.00)	-6.46**
	Maternal support <sup>b</sup>	Offending variety	Aggressive	0.03 (0.02)	1.70	0.03 (0.02)
Income			0.01 (0.02)	0.77	0.02 (0.02)	1.21
Likelihood of offending		Aggressive	0.23 (0.04)	5.46**	0.13 (0.03)	3.76**
		Income	0.21 (0.03)	6.99**	0.14 (0.02)	5.71**
Offending variety		Aggressive	0.03 (0.07)	0.41	0.09 (0.10)	0.90
		Income	-0.09 (0.08)	-1.13	0.03 (0.09)	0.32
Ran away <sup>c</sup>	Likelihood of offending	Aggressive	-0.25 (0.25)	-0.99	-0.73 (0.29)	-2.54**
		Income	-0.59 (0.23)	-2.52**	-0.94 (0.24)	-3.96**

*Note.* Est. (S.E.) = unstandardized path coefficient. Est./S.E. = standardized path coefficient (interpreted as a z-score, with values  $\geq 1.95$  sig. at  $p < 0.05$ ).

<sup>a</sup>0 = opposite-sex attraction only, 1 = bisexual attraction; <sup>b</sup>Higher values indicate more maternal support; <sup>c</sup>0 = did not run away, 1 = ran away one or more times.

\* $p \leq 0.05$ ; \*\* $p \leq 0.01$ .

Table 13

*Indirect Effects of Structural Equation Modeling with Sexual Identity (Wave III) as Predictor*

Outcome Measure	Path/Effect	Boys		Girls		
		<i>Est. (S.E.)</i>	<i>Est./S.E.</i>	<i>Est. (S.E.)</i>	<i>Est./S.E.</i>	
<i>Offending variety</i>	Aggressive	$SO^a \rightarrow MS^b \rightarrow AO^c$	0.00 (0.01)	0.30	-0.02 (0.01)	-1.19
		$SO \rightarrow RA^d \rightarrow AO$	0.00 (0.00)	0.38	0.00 (0.00)	0.31
		$SO \rightarrow MS \rightarrow RA \rightarrow AO$	0.00 (0.00)	-0.24	0.00 (0.00)	0.32
		<i>Total Indirect Effects</i>	0.00 (0.01)	0.37	-0.02 (0.01)	-1.18
	Income	$SO \rightarrow MS \rightarrow IO^e$	0.00 (0.00)	0.28	-0.02 (0.01)	-1.52
		$SO \rightarrow RA \rightarrow IO$	0.00 (0.00)	-0.73	0.00 (0.00)	-0.69
		$SO \rightarrow MS \rightarrow RA \rightarrow IO$	0.00 (0.00)	0.29	0.00 (0.00)	-0.80
		<i>Total Indirect Effects</i>	0.00 (0.00)	-0.19	-0.02 (0.01)	-1.69
<i>Likelihood of offending</i>	Aggressive	$SO \rightarrow MS \rightarrow AO$	0.01 (0.05)	0.30	-0.09 (0.03)	-3.21**
		$SO \rightarrow RA \rightarrow AO$	0.00 (0.01)	-0.70	-0.01 (0.01)	-1.10
		$SO \rightarrow MS \rightarrow RA \rightarrow AO$	0.00 (0.00)	0.29	-0.01 (0.00)	-2.21**
		<i>Total Indirect Effects</i>	0.01 (0.05)	0.22	-0.11 (0.03)	-3.68**
	Income	$SO \rightarrow MS \rightarrow IO$	0.01 (0.04)	0.30	-0.10 (0.02)	-4.26**
		$SO \rightarrow RA \rightarrow IO$	-0.01 (0.01)	-0.88	-0.01 (0.01)	-1.17
		$SO \rightarrow MS \rightarrow RA \rightarrow IO$	0.00 (0.00)	0.30	-0.01 (0.00)	-3.05**
		<i>Total Indirect Effects</i>	0.00 (0.04)	0.09	-0.12 (0.03)	-4.51**

*Note.* SO = Sexual orientation (i.e., sexual identity at Wave III). <sup>b</sup>Maternal support. <sup>c</sup>Aggressive offending. <sup>d</sup>Ran away. <sup>e</sup>Income offending.

\* $p \leq 0.05$ ; \*\* $p \leq 0.01$ .

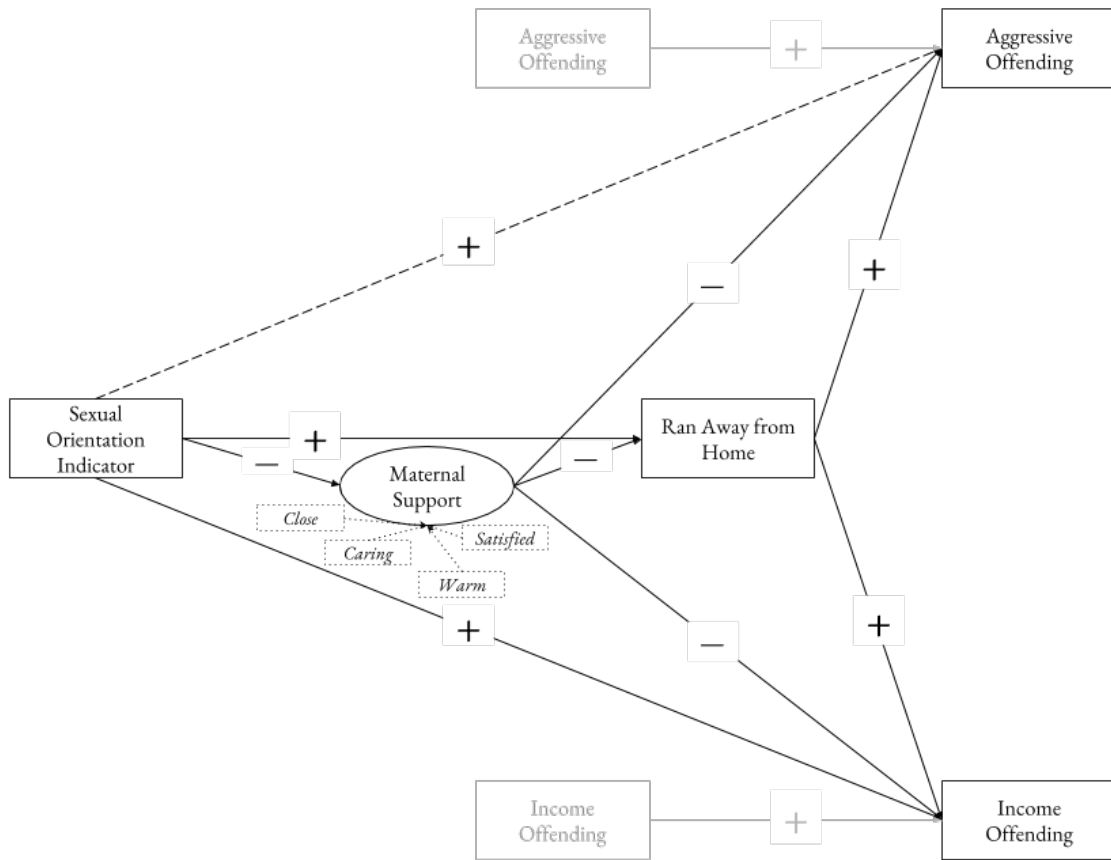


Figure 1. Hypothesized Model. Identical models were estimated separately for boys and girls, as well as estimated separately with romantic attraction at Wave I or sexual identity at Wave III as the sexual orientation indicator. Pluses and minuses indicate the hypothesized directions of effect. Gray boxes and lines indicate control variables. Other covariates (i.e., age and effect coded race/ethnicity variables) are not shown for ease of presentation. Dashed line (---) indicates non-significant hypothesized relation between bisexual attraction or identity and aggressive offending. Squares enclosed with dotted lines are indicators for the maternal support latent variable. See Method section for more details about structural equation modeling.

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APPENDIX A  
AGGRESSIVE AND INCOME OFFENDING ITEMS USED TO COMPOSE  
VARIETY SCORES.

Aggressive Offenses:

1. During the past 12 months, how often did the following happen? You pulled a knife or gun on someone.
2. During the past 12 months, how often did the following happen? You shot or stabbed someone.
3. During the past 12 months, how often did you get into a serious physical fight?
4. In the past 12 months, how often did you use a weapon in a fight?
5. In the past 12 months, how often did you hurt someone badly enough to need bandages or care from a doctor or nurse?
6. In the past 12 months, how often did you deliberately damage property that didn't belong to you?
7. In the past 12 months, how often did you take part in a fight where a group of your friends was against another group?

Income Offenses:

1. In the past 12 months, how often did you take something from a store without paying for it?
2. In the past 12 months, how often did you steal something worth less than \$50?
3. In the past 12 months, how often did you steal something worth more than \$50?
4. In the past 12 months, how often did you sell marijuana or drugs?
5. In the past 12 months, how often did you go into a house or building to steal something?
6. Since {Month of Last Interview}, how many times have you given someone sex in exchange for drugs or money?