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HETEROGENEITY AMONG JUVENILE SEXUAL ABUSERS: AN EXPLORATION OF

CRIME CHARACTERISTICS, FAMILY CONTEXT, AND MENTAL HEALTH

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DEDICATION

For my young clients, their families, and all victims of sexual abuse.

For Olive, Gabe, Wilder, and Brooks,
safer tomorrows

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ABSTRACT

Juveniles represent approximately 20% of those arrested for sexual crimes in the United States each year and more than a third of those arrested for sexual crimes involving juvenile victims. Although researchers have determined this population to be heterogeneous, little is understood about typologies of juvenile sexual abusers (JSAs) according to their sexual offense characteristics or the possible relationship of their families, mental health, and nonsexual delinquency to such typologies. In the present study, I identified classes of JSAs according to their sexual crime characteristics and drew upon rational choice and social learning theories to help explain how these classes might be understood. Using data collected from male adolescents adjudicated for sexual offenses and living in secured residential facilities, this study was designed to address three specific questions: 1) Do latent classes of JSAs emerge based on sexual crime characteristics? 2) What is the relationship between classes of JSAs derived from their sexual crime characteristics with their family contexts, mental health, and concurrent delinquency? 3) Can JSAs be classified more broadly according to sexual crime characteristics, family contexts, mental health, and concurrent delinquency?

The study included cross-sectional data from 573 JSAs, collected at multiple sites in two states over an eight-year period. Most grew up in households that were marked by high levels of exposure to antisocial activity and had two adults. Symptoms of depression were prevalent in the sample (37.2%), while few showed symptoms of anxiety at levels of clinical concern (12.9%). With respect to the first research question, four unique latent classes were successfully identified with sexual crime characteristics often explored in the JSA literature. For the second research question, classes of JSAs were distinguished by the presence of violent adults in the home, multiple moves and/or homelessness, anxiety, low attachment to mother, and violent

delinquency. For the third question, a latent model could not be confidentially identified using fit statistics, although I found evidence to suggest that family contexts have the most profound influence on latent classes of JSAs when explored alongside sexual crime characteristics, mental health symptoms, and concurrent delinquency.

The results of this dissertation have strong implications for the field of social work and future directions for research are suggested. The ability to identify distinct typologies on the basis of sexual crime characteristics marks an innovation to the field that strengthens how heterogeneity is framed in the etiology of JSAs. Results also highlight the important role of family and mental health in understanding subtypes of JSAs. Treatment implications underscore how families might be optimally considered in developing treatment strategies depending upon the typology of the JSA. Policy implications emphasize the importance of understanding typologies as they relate to appropriateness of consequences associated with juvenile sexual abusing.

CHAPTER 1

INTRODUCTION

1.1 Problem Statement

There is a great deal of concern among researchers, treatment providers, and policymakers with regard to juvenile males who commit acts of sexual abuse (Malin, Saleh, & Grudzinskas, 2014; van Outsem, 2007). In 2014, law enforcement agencies in the United States reported that those under the age of 18 accounted for approximately 16% of the 16,473 arrests made for rape and 17% percent of the 43,422 arrests for all other sexual crimes except prostitution (United States Department of Justice, 2014). Researchers have estimated that juvenile perpetrators account for more than a third of sexual victimizations involving juvenile victims (Finkelhor, Ormrod, & Chaffin, 2009), often leaving their victims with profound psychological and neurological sequelae which often endure into adulthood (Chapman, Dube, & Anda, 2007; Randolph & Mosack, 2006).

Although specific definitions change by jurisdiction, a sexual crime is generally considered to have occurred when a sex act involves a nonconsenting individual, or a person who cannot give consent due to age, ability, or state of impairment. Nationally, nearly half of all sexual crimes for which juveniles are prosecuted involve fondling or sexual touch; roughly one third involve genital, anal, or oral penetration; and the remaining portion is made up of non-forcible sexual acts, such as genital exposure, public masturbation, or child pornography possession (Finkelhor et al., 2009).

Early understanding of juvenile sexual abusers (JSAs) was based on adult male sexual offender research, as investigators determined that many of these men made their sexual offense debuts during adolescence (Abel, Osborn, & Twigg, 1993; Abel & Rouleau, 1990; Groth, Longo,

& McFadin, 1982). While popular beliefs about the nature of sexual offending seem to stem from these early findings, support for the continuation hypothesis of sexual offending—adult sexual offenders often begin their sexual offending in childhood or adolescence—has not been substantiated by more recent findings. In a sample of 465 adult men incarcerated for sexual offending, Harris (2013) found that fewer than 60 were arrested for a sexual crime prior to turning 18. Researchers using birth cohort data in the United States and elsewhere have found that more than 90% of adults who committed sexual offenses did so for the first time following their 18th birthdays (Lussier & Blokland, 2013; Zimring, Jennings, Piquero, & Hays, 2009). In one of these cohorts it was also found that, among those who committed a sexual offense prior to age 18, only 4% to 10% sexually offended again through age 30 (Lussier & Blokland, 2013; Lussier, van Den Berg, Bijleveld, & Hendriks, 2012). A smaller cohort study ($N = 411$) that tracked a group of males from a working-class community in the United Kingdom, beginning at ages 8 and 9, had similar findings. Four committed a sexual offense in adolescence, and none of the four committed a subsequent sexual offense through age 50 (Piquero, Farrington, Jennings, Diamond, & Craig, 2012).

Such findings are consistent with longitudinal studies of JSA populations, as researchers have consistently reported sexual offense recidivism among JSAs to be between 4% and 21% (McCann & Lussier, 2008; Reitzel & Carbonell, 2006; Worling, Bookalam, & Litteljohn, 2012; Worling & Curwen, 2000), with the author of one meta-analysis of 63 sets of data finding a mean sexual recidivism rate of 7% (Caldwell, 2010). Clearly, JSAs are not adult sexual offenders in-waiting. Less clear is who they are and how those who are at the highest risk for sexual offense recidivism can be best identified.

A small but growing body of research has revealed that JSAs are a heterogeneous population across a variety of domains, including demographics, family backgrounds (Christiansen & Vincent, 2013) and mental health indicators (Boonmann et al., 2015; Harris, Walfield, Shields, & Letourneau, 2015). It is unclear how this heterogeneity might impact treatment and policies related to JSAs. For example, authors of a recent meta-analysis on adult and JSA sexual offender treatment efficacy found that treatment, in general, has been effective in reducing sexual reoffending among JSAs, reporting a mean reduction in recidivism of 25% across studies using a variety of comparison groups, including those with random assignment and quasi-experimental designs (Kim, Benekos, & Merlo, 2015). While this finding is promising, there is no single, commonly practiced sexual offender treatment for JSAs. In other words, so-called sex offender treatment can look quite different with regard to frequency, modality, and theoretical orientation. Given the wide variance in treatment across a great number of agencies and providers who serve the JSA population, it remains unclear what might account for treatment efficacy, and for whom treatment might be most effective. To gain a better understanding of what might increase treatment efficacy among JSAs in general, more must be understood about the heterogeneity in this population and the resultant potential variance of their treatment needs.

Despite the dramatic drop in the prevalence of sexual abuse over the last 25 years (Finkelhor & Jones, 2012), the trend among states is to react to public anxiety about sexual offending with harsher sentences and increased levels of community notification (Armstrong, Miller, & Griffin, 2015; Chaffin, 2008; Kernsmith, Craun, & Foster, 2009; Levenson, Brannon, Fortney, & Baker, 2007). This has led to policy writers mandating an increase in punitive sentencing for JSAs, including more frequent and longer periods of incarceration, as well as placement on sexual offender registries for sentences up to life (Letourneau, Armstrong,

Bandyopadhyay, & Sinha, 2013). Such punishments might ease community fears; however, they are grounded in misinformation regarding the impact of sexual offender registries on sexual offending, as there is no evidence to support the claim that placing youths on registries has reduced sexual offence incidence or recidivism (Letourneau, Levenson, Bandyopadhyay, Sinha, & Armstrong, 2010).

Putting JSAs on sexual offender registries is hardly a benign policy measure. Doing so may put youths at an increased risk for ongoing involvement in the criminal justice system when compared to JSAs whose names do not appear on registries (Letourneau & Armstrong, 2008). While specific reasons for this increase have not been measured, a national sample of nearly 800 treatment providers overwhelmingly agreed that registering JSAs is detrimental to their psychosocial functioning, school performance, and living stability, while increasing their risk of public shaming and harassment (Harris et al., 2015) all of which are associated an elevated risk of antisocial activity among youths (Farrington, Loeber, & Ttofi, 2012). Perhaps this is why more than a third of providers in the study also believed that public notification increased the likelihood of reoffending by their clients, both sexual and nonsexual. Of course, even without sexual offender registries elevating the risk of recidivism, some JSAs present a risk for sexual and nonsexual reoffending for reasons that remain unclear. It seems possible that previously unidentified traits, or latent characteristics, among subgroups of JSAs might help explain why different policies affect subtypes of JSAs differently.

Complicating studies of heterogeneity among JSAs is that many indicators found in JSA etiology overlap with those found among general delinquents (youths who have committed criminal offenses that are not sexual in nature). Researchers have found that JSAs and general delinquents have a great deal in common in terms of personality, early childhood experiences,

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abuse histories, and antisocial attitudes and behaviors (Brown & Burton, 2010; Butler & Seto, 2002; Couwenbergh et al., 2006; DeLisi, Neppl, Lohman, Vaughn, & Shook, 2013; Ronis & Borduin, 2007; Sullivan, Farrell, & Kliewer, 2006). Further blurring this line is that JSAs are not only likely to have committed acts of general delinquency in addition to their sexual offenses (Brown & Burton, 2010; Butler & Seto, 2002; Ronis & Borduin, 2007), but are more likely to later reoffend with an act of nonsexual delinquency than with a sexual offense (Caldwell, 2010; Christiansen & Vincent, 2013; Hendriks, van den Berg, & Bijleveld, 2015; Vandiver, 2006; Worling & Langstrom, 2006). With such an overlap in behaviors and etiologies, parsing risk factors for sexual offending from those for general delinquency is challenging. To better understand JSAs, more needs to be understood about indicators unique to sexual offending: Specifically, what might characteristics of their sexual offenses tell us about their heterogeneity?

Some researchers of JSAs have reported heterogeneity among sexual crime characteristics, such as victim selection, modus operandi, and offense type (Aebi, Vogt, Plattner, Steinhausen, & Bessler, 2012; Burton & Meezan, 2004; Finkelhor et al., 2009). Comparison studies have found differences between JSAs according to a variety of these characteristics, such as JSAs with child victims compared to those with no child victims (e.g. Keelan & Fremouw, 2013), JSAs with at least one male victim compared to those without male victims (e.g. Seto & Lalumière, 2010), JSAs who started their sexual offending in pre-adolescence compared to those who started in adolescence (e.g. Burton, 2000), among others. A limitation of these investigations is that, in all cases, such comparisons are made on the basis of the researcher's a priori assumptions regarding the importance of these comparison indicators. In this dissertation, I addressed this weakness, allowing the data to reveal latent typologies of JSAs.

The authors of one study found differences between JSAs without concurrent criminality (sex-only) and JSAs with concurrent criminality (sex-plus; Butler & Seto, 2002). These authors found that sex-only JSAs had significantly fewer conduct problems and risks for future delinquency than their sex-plus JSA counterparts, who resembled criminally versatile youths who scored higher on risk indicators for general delinquency. Does this suggest that sex-plus JSAs are general delinquents who happen to commit a sexual crime among a constellation of delinquent acts, whereas sex-only JSAs represent a subtype that commits sexual abuse for reasons unrelated to general delinquency?

Researchers exploring JSA etiology have mostly overlooked the potential influence of family on sexual offending behaviors. This absence is rather conspicuous, as many have found that JSAs are often troubled with regard to issues of trust and attachment (Baker, Tabacoff, Tornusciolo, & Eisenstadt, 2003; Bovard-Johns, Yoder, & Burton, 2015; Miner, Romine, Robinson, Berg, & Knight, 2016), and experience a variety of other family problems (Hendriks et al., 2015; van der Put, van Vugt, Stams, Dekovic, & van der Laan, 2013). Furthermore, the abuse histories of family members are often associated with both the commission of violence (Smith & Thornberry, 1995) and sexual offences of juveniles (Johnson & Knight, 2000; Seto & Lalumière, 2010). Finally, among the victims of JSAs, approximately 25% are family members, while another 63% are acquaintances (Finkelhor et al., 2009). The current study addressed this gap in the literature by exploring the nature and composition of JSAs' families, including levels of attachment, and investigating the relationship of these indicators to JSA subtypes.

Although no single mental health factor is believed to be responsible for sexual offending among JSAs, elevated symptoms of depression and anxiety have been long been reported in etiological investigations of the population (Becker, Kaplan, Tenke, & Tartaglini, 1991;

Boonmann et al., 2015; Hunter, Figueredo, Becker, & Malamuth, 2007; Jeglic, Mercado, & Levenson, 2012; Jencks & Burton, 2013), as well as sexual offense recidivism studies (Worling et al., 2012; Worling & Curwen, 2000; Worling & Langstrom, 2006). However, in all studies, such symptomology tells only part of the story and only for some of the JSAs. In the current study, I explored the relationship of depression and anxiety to newly identified classes of JSAs.

In summary, the problem of sexual abusing by JSAs is one of great importance to researchers and policy makers, as current efforts to ameliorate the problem have been ineffective. Researchers have identified a number of etiological indicators that might contribute to a young person becoming a JSA. However, JSAs have a great deal in their etiology that overlaps with general delinquents, complicating prevention efforts. Furthermore, JSAs are not a monolithic population. Much remains to be understood regarding their heterogeneity. By revealing new classes of JSAs that emerge from sexual characteristics, subtypes of JSAs can be explored independently of general delinquents, perhaps leading to new lines of research that might target treatment and policies aimed at ameliorating sexual abuse.

1.2 Questions

The overall intent of this dissertation was to explore heterogeneity among juvenile sexual abusers (JSAs). The analyses conducted were designed to address three specific research questions in a sample of adjudicated JSAs:

1) Do latent classes of JSAs emerge based on sexual crime characteristics?

2) What is the relationship between classes of JSAs derived from their sexual crime characteristics with their family contexts, mental health, and concurrent delinquency?

3) Can JSAs be classified more broadly according to sexual crime characteristics, family contexts, mental health, and concurrent delinquency?

Analyses for the first question were conducted to identify classes of JSAs on the basis of their sexual crime characteristics. Given the overlap in etiological indicators between general delinquents and JSAs, using sexual crime characteristics allowed me to uncover potential typologies that are unique to JSAs with no possible overlap among general delinquent populations. This was an important first step in developing more nuanced typologies that could aid in tailoring interventions to better address the needs of JSAs than do current one-size-fits-all approaches.

In the second question, I examined the role of family contexts and mental health in JSA typologies. Given the role of family in the development of children and adolescents, as well as the impact of mental health on behavioral outcomes, identifying how family context and mental health symptoms might present differently within typologies of JSAs will likely be important for targeting treatment needs and policy implications.

The final series of analyses I completed was an exploration of JSA typologies on the basis of sexual crime characteristics along with the significant family context and mental health indicators identified in question two. Introducing additional indicators into latent models of JSAs is an important step in confidently identifying typologies that are well fitted, parsimonious, and provide useful information that will impact prevention and intervention efforts.

1.3 Organization of Dissertation

This dissertation is organized into seven chapters. The first chapter provides an overview of the issues addressed and the specific aims of the analyses conducted. The theoretical foundations of my research are presented in Chapter 2. Rational choice theory and social learning theory are each outlined and the implication of these theories to my research questions is explained. Guided in part by these theoretical foundations, previous research is synthesized

and gaps in knowledge are identified in Chapter 3. My research questions and the hypotheses guiding the work are presented in Chapter 4. The methods, including study design, sample, measures, and analytic plan are outlined in Chapter 5. In Chapter 6, I describe the dissertation findings, returning to the hypotheses outlined in Chapter 4. Finally, in Chapter 7, I review key findings in light of the study limitations, highlight my contributions to the literature, and describe the implications of this work for scholarship, practice, and policy.

CHAPTER 2

THEORETICAL FRAMEWORK

2.1 Theoretical Models

To date, the majority of studies on JSA populations have been written from an atheoretical framework. The failure among authors to use theory has allowed their results to be interpreted through a broad range of principles that are dependent upon the orientation and experiences of each reader. Such a broad allowance for interpretation may have contributed to the common belief among many that JSAs are a homogeneous population, as it is it difficult to explain population heterogeneity without theoretical frameworks to account for possible differences. In this dissertation, two theoretical models were used to frame my inquiries: rational choice theory (Sen, 1987) and social learning theory (Bandura, 1986). These theories were not used to predict results, as the results anticipated unseen characteristics to emerge from the data. Instead, the theories provided a framework for explaining the results.

2.1.a. Rational Choice Theory

Rational choice theory (RCT) is useful in understanding classes of JSAs that emerge from sexual crime characteristics. A widely used economic theory, it is rooted in the assumption that individuals are in a constant negotiation of the risks and rewards involved in the pursuit of one or more goals, and that people choose alternatives to best serve their needs after a cost-benefit analysis (Sen, 1987). For example, RCT could be used to argue why the majority of adolescents will never walk into a convenience store with a gun and demand cash from the clerk, regardless of financial need: the opportunity costs associated with being caught (freedom in society, contact with loved ones, etc.) outweigh the potential benefits of not being caught (a few hundred dollars).

The developers of the National Health and Social Life Survey (NHSLS), a widely cited study of adult sexual behavior in the United States, suggested that RCT offers an important lens through which to explain sexual behavior (Laumann, Gagnon, Michael, & Michaels, 1994). To illustrate this point in their study, the authors offered four common goals of sexual behavior: sexual pleasure, emotional satisfaction associated with being intimate with someone toward whom one feels affection, procreation, and to improve one's social standing among friends. They went on to explain that meeting potential partners and negotiating sexual relationships (goal attainment) incurs a variety of costs, including expenditures of time, money, emotional energy, and social resources.

Of course, individuals differ in the attributes they value in prospective sexual partners depending on their personal preferences and goals for sex, such as physical attractiveness, companionship, loyalty to family, intelligence, and so on. Furthermore, the value one places on a potential sexual partner is also partially determined by supply and demand. A person living in a densely populated area with high heterogeneity, for example, feasibly has many more potential sexual partners than someone living in a rural area that is more homogenous. Those who possess a greater number of traits that are most valued in a particular culture are in greater demand for sexual partnership than those who possess fewer traits, which might be why those with a similar number of desirable traits tend to partner with one another. When there is disparity in the sexual marketplace among those who possess a similar number of desirable traits, those who have the fewest traits are less likely to find a sexual partner.

It is reasonable to assume the developers of the NHSLS study had consensual sexual activity on their minds when choosing their theoretical frameworks. Is it also possible that JSAs undergo a similar process before committing sexual abuse? It certainly seems likely that for

some JSAs there is overlap in the goals associated with consenting sexual behaviors and abusive sexual behaviors (e.g. sexual pleasure), while there are also likely goals that are unique to sexual abuse (e.g. gaining mastery of one's experience as a sexual abuse victim). However, given that sexual offending always involves at least one victim (someone who did not consent or could not fully consent due to age or ability) rather than a consenting partner, there is likely less overlap in the costs associated with goal attainment.

Researchers have found that JSAs have a disproportionately higher number of child victims (Kemper & Kistner, 2007; Parks & Bard, 2006) compared to peer or adult victims. While it is likely that a small proportion of these youths might have been motivated by the goal of satisfying pedophilic urges or fantasies (Murphy, DiLillo, Haynes, & Steere, 2001), RCT can be used to explain other possible motivations for choosing child victims. Two components of RCT that are particularly useful to economic decision making can be applied to sexual decision making: risk tolerance and market scarcity.

Risk tolerance. One clear risk associated with choosing to commit a sexual offense is the risk of getting caught. It is easy to imagine that peers and adults are better equipped than most children to understand and defend against unwanted or inappropriate sexual interactions under most circumstances, which could partially explain why JSAs with older victims tend to be more violent and forceful than those with child victims (Hart-Kerkhoffs, Doreleijers, Jansen, van Wijk, & Bullens, 2009; Hendriks & Bijleveld, 2004). Young children are often simultaneously solicitous of the attention of older youths and less discerning of socially appropriate types of physical interaction. For a JSA who might be motivated purely by a goal of satiating sexual curiosity, for example, compliant and eager-to-please children who are known to the JSA would likely be much more attractive targets than older individuals who will offer more resistance

under most circumstances, or at least require a more honest negotiation. Furthermore, JSAs might also perceive children as lower-risk targets for sexual abuse because they are more willing to exchange games, gifts, and/or favors in exchange for their silence about the abuse than adolescents or adult. Also, in the event that such an exchange might fail, from a developmental perspective, children are more likely than peers or adults to take threats of harm seriously (e.g. violence toward parents, siblings, or pets) and be more susceptible to a variety of threats (e.g. withholding of time, love, or affection).

In terms of family, risk tolerance as it relates to perceptions of supply and demand might also explain some sexual offending among JSAs, particularly among those with severe trauma histories related to abuse, neglect, and/or abandonment of caregivers, resulting in intimacy deficits. Researchers have found that intimacy seeking is one reason why some adults sexually molest children (Cortoni & Marshall, 2001; Marshall, 2010), so it makes sense that this could also be true for some JSAs. For some traumatized JSAs, any form of rejection might be perceived as especially damaging, leading them to go to great lengths to avoid it. This might help explain why, among JSAs, more severe sexual offenses were found to be associated with lower levels of trust and communication with their mothers and peers (Yoder, Leibowitz, & Peterson, 2016). A youth who is highly motivated for sexual contact as a way of seeking intimacy might perceive a low supply of peers available to offer this and instead seek a loving and accepting child as a more available object of affection. Even if the child ultimately does not acquiesce to an initiation for sexual contact, a traumatized youth might choose to interpret the rejection as the child's discomfort or confusion, which may be easier to tolerate than a rejection of intimacy and therefore a rejection of him.

Finally, supply and demand could also help explain a small minority JSAs who have same-sex sexual interest and choose male child victims. Only 3% to 5% of high school students describe themselves as lesbian, gay, or bisexual (*Massachusetts Youth Risk Behavior Survey*, 2001). Sexual minority youth are more likely than their heterosexual peers to be harassed, physically and sexually assaulted, abuse substances, and exhibit suicidal behaviors (Coker, Austin, & Schuster, 2010; King et al., 2008; Saewyc, 2011), and 64% have reported feeling unsafe at school (*National School Climate Survey*, 2003). For some youth with risk factors for becoming a JSA, the choice of a child male victim might be associated with the perception that there are no age-appropriate males with whom to explore same-sex sexual curiosities without the fear of harassment or rejection that might follow an expression of same-sex sexual interest.

Market scarcity. Pedophilia has been used to explain why approximately half of adult sex offenders with child victims choose child victims (Seto, 2008, 2010). While evidence has been presented to show that some JSAs might be sexually attracted to prepubescent children (Murphy et al., 2001), sexual attraction has not been strongly associated with sexual offending of children by JSAs. Using the lens of RCT, market scarcity could be used to explain the finding that convenience of access to victims plays a profound role in victim selection for many JSAs (Burton, 2003; Worling, 1995a). Whereas adults are more mobile and therefore able to access more potential victims, it makes sense that many youths would choose their victims from among those who are proximal to them. For example, some have found that child victims among JSAs are sometimes accounted for by younger siblings living in the same home, and/or other youngsters with whom JSAs have extended access, such as babysitting roles (Kaufman et al., 1998; Kaufman, Hilliker, & Daleiden, 1996). This could also explain why JSAs are more likely to have male victims than adult sexual offenders (Finkelhor, Ormrod, Turner, & Hamby, 2005).

Worling (1995a) has hypothesized that the choice of a male victim among JSAs often occurs when a male child happens to be the easiest to access, including incest offenses.

2.1.b. Social Learning Theory

A criticism of RCT that some have lodged is that it is too general and therefore fails to aid in explaining the specific contexts necessary to understand social phenomena in a meaningful way (Hodgson, 2012). Social learning theory is one framework sometimes used to provide auxiliary information that helps explain the context of how people choose goals and why some mechanisms of goal attainment are available to certain people while others are not. Social learning (Bandura & Walters, 1963) or social cognitive theory (Bandura, 1986) is rooted in the concept of learning through modeling. The theory, which incorporates operant conditioning, involves a process by which people imitate behaviors to which they have been exposed in certain conditions. Such imitation occurs when there are similarities between the person modeling a behavior and the person learning, and when the modeled behavior is perceived to have been reinforced. The deviant behaviors of youths has been described using this theory as a process in which the youths observe the actions of others, as well as the consequences of these actions, store the information, and later imitate the behavior in an attempt to achieve the same reward (Akers & Cochran, 1985; Stinson, Becker, & Sales, 2008). For example, this might help explain why children who report witnessing adult sexual intercourse have been found to display more sexualized behaviors than other children (Friedrich, Grambsch, Broughton, Kuiper, & Beilke, 1991). As Bandura (1973) put it, "People are not born with preformed repertoires of aggressive behavior; they must learn them in one way or another" (p. 61).

At the beginning of this chapter, I offered an example of how RCT could be used to explain how opportunity costs might have been weighed between an adolescent's goal (e.g.

getting cash immediately) and his decision making (e.g. robbing a convenience store). Social learning theory could be used in this example to provide the context for the goal as well as the mechanisms involved in decision making: the adolescent wanted money to buy the same $300 sneakers worn by his uncle, a highly respected member of his family, and he considered robbing a convenience store because convenience stores in his neighborhood have been successfully robbed by people known to him using easily accessible guns.

In this example, there are at least three rewards associated with this behavior: getting money, wearing new sneakers, and looking like his uncle. The option of robbing a convenience store is a mechanism that also resulted from social learning: Given the same three goals for a different adolescent in a middle class suburb, an alternative antisocial behavior may have been breaking into a neighbor's house and stealing cash or jewelry. In addition, the perception of opportunity risk itself is a consequence of social learning. The urban, working-class, adolescent might weigh the opportunity risks of robbing a convenience store against long-term incarceration, whereas the middle class adolescent in a suburb might weigh the opportunity risks of breaking into the neighbor's home against probation and fines.

Victim-to-victimizer. It is logical that the authors of some studies exploring JSA etiology have used social learning theory as a framework (Burton & Meezan, 2004; Burton, Miller, & Shill, 2002), as rates of childhood sexual victimization among JSAs are approximately double the rates observed among the general population (Burton & Schatz, 2003; Crouch, Hanson, Saunders, Kilpatrick, & Resnick, 2000; Finkelhor, Hotaling, Lewis, & Smith, 1990; Hunter & Figueredo, 2000; Laumann et al., 1994; Ryan, 1989), and are significantly higher than non-sexually offending general delinquents (Brown & Burton, 2010; Leibowitz, Burton, & Howard, 2012). For JSAs who have been sexually abused, it makes sense that at least some of

their behaviors can be explained by the modeling of what was done to them or what they witnessed being done to others (Bandura & Walters, 1963; Ryan, 1989). Explicit victim-to-victimizer relationships empirically supported in JSA populations include modus operandi (e.g. use of games in exchange for sex), type of sexual offense (e.g. genital fondling), relationship to victim (e.g. relative or stranger), and victim gender (Burton, 2003; Leibowitz, 2012; Veneziano, Veneziano, & LeGrand, 2000).

Of course, it has also been well established that not all JSAs have histories of sexual abuse victimization, and that most child sexual abuse victims do not go on to become sexual abusers (Finkelhor, 1984; Hunter, Figueredo, Malamuth, & Becker, 2003; Widom, 1989). In these cases, what does social learning have to offer as a framework for understanding heterogeneity among JSAs?

Models of instability. Bandura (1986) suggested that instable or chaotic homes increase opportunities for youth to learn poor models of managing discomfort or aggression. This aligns with Gottfredson and Hirschi's (1990) influential theory of adult criminal etiology which stressed a close connection between parental instability and longitudinal criminality, and also helps explain why researchers of adult sexual offenders have found the offenders' childhoods to be characterized by poor parenting and/or poor socialization (Marshall, 2010; Ward, 2002).

There have been a number of studies on how family context might be a pathway to general (nonsexual) juvenile delinquency. Authors have found a strong relationship between being a general delinquent and having parents with a pending divorce, a single parent, or foster parents (Nijhof, de Kemp, Engels, & Wientjes, 2008). Three out of four incarcerated youths have been found to experience parental divorce or separation, or have parents who never married (Price & Kunz, 2003), while youths who spend a large portion of their lives living in institutional

settings are even more likely to experience involvement with the criminal justice system (Haas, Farrington, Killias, & Sattar, 2004; Holman & Ziedenberg, 2006), as are those who are wards of the state (Ryan & Testa, 2005).

In contrast, authors have not spent much time investigating the context of JSAs' homes in terms of with whom they were raised. A few have reported that the homes of JSAs are characterized by the absence of one or more parents (Hummel, Thömke, Oldenbürger, & Specht, 2000; Prentky et al., 1989) or parental instability (Daversa & Knight, 2007), although much more remains to be understood in the relationship of family context and becoming a JSA.

Models of dysfunction. While the context of the home a JSA is raised in might indicate an increased opportunity for chaos and therefore exposure to learning negative behaviors, perhaps a more obvious indicator of maladaptive social learning is homes marked by family problems. As is the case with juvenile delinquents (Catalano & Hawkins, 1996; Tolan & Gorman-Smith, 1997), families of JSAs have been characterized by high levels of criminality among adults in the home, poverty, substance abuse, and violence between adults in the home (Baker, Tabacoff, Tornusciolo, & Eisenstadt, 2001; Barbaree & Langton, 2006; Morris, Anderson, & Knox, 2002; Righthand & Welch, 2004; Yoder & Brown, 2015; Zgourides, Monto, & Harris, 1997). Yet to be understood is how these might present differently among different JSAs. Is it possible that some of these indicators are more strongly associated with some types of sexual offenses than others? If so, what implications might this have for treatment and other policies associated with JSAs?

2.1.c. Integration of Theories

In the present study, rational choice provided a framework for understanding how individuals might make decisions after considering the risks and rewards associated with

different paths to achieving their goals. Social learning provided a context for why goals may have been set and why different mechanisms may have been considered by individuals who have shared similar goals and family influences.

These theories produce largely unmeasurable inferences, as they frame how experiences are taken-in, interpreted, and used to inform individual behavior. In the current study, RCT provided a frame for how unseen, latent characteristics might emerge from sexual crime characteristics, while social learning framed how observations or experiences may have informed latent classes.

2.2 Implication of Theory for Research Questions

While it is likely that most adolescents are curious about sexuality and go about choosing methods to explore these interests, very few force sex acts upon others or choose inappropriately aged victims to engage in sexual interactions. Some might commit acts of sexual abuse with no goal in mind at all, but as one of many impulsive acts (Burton, 2008), while others may be motivated by a specific goal as described in the previous section. In addition to a variety of reasons why some juveniles sexually offend, there are also likely a variety of reasons why these juveniles choose different victims and methods to commit these acts. In this study, I explored how latent qualities of JSAs form based on the characteristics of their sexual crimes and then drew on a dimensional approach to understand how family context may have influenced decisions.

2.3 The Present Study

I used these two theoretical principles in the present study to guide the models exploring heterogeneity among JSAs. Specifically, the rational choice perspective assumes that individuals are constantly negotiating the risks and rewards associated with their behaviors; in this study, I

tested how groups of JSAs form on the basis of their sexual crime behaviors. Also informed by

social learning, I investigated the influence of family context on groups of JSAs. Finally,

integrating these theories, I examined how family as a context changed the composition of JSA

classes. The theories presented are not used to predict results, as I am seeking to uncover latent

properties among the variables. Instead, they provide guidance to explain results that emerge

from the data.

CHAPTER 3

LITERATURE REVIEW

In this chapter, I provide a review of JSA literature that includes evidence of the scope of the problem and justifies the decisions I made in choosing variables for my analyses. Specifically, I review how sexual crime characteristics, family, mental health, and concurrent delinquency have been used by other researchers in investigations of JSA etiology and heterogeneity. I conclude this review by offering some of the methodological limitations to the current state of the literature on JSAs.

3.1 Prevalence

Juveniles account for nearly 20% of arrests made for sexual abuse each year (United States Department of Justice, 2014), yet less than 2% of the youth population sexually offends (Tracy, Wolfgang, & Figlio, 1990; Zimring, Piquero, & Jennings, 2007). Among JSAs, there is a low likelihood of repeat sexual offending, as the best estimates of sexual abuse recidivism among JSAs range from 4% to 21% (Caldwell, 2010; Gretton, Mcbride, Hare, Shaughnessy, & Kumka, 2001; McCann & Lussier, 2008; Nisbet, Wilson, & Smallbone, 2004; van der Put et al., 2013; Worling & Curwen, 2000; Worling & Langstrom, 2006). Given low base rates and low continuance rates, identifying JSAs at the greatest risk for committing and re-committing these acts is difficult.

3.2 Characteristics of JSAs

As is true of the development of general delinquency (Farrington et al., 2012), researchers have highlighted a confluence of social and psychological factors that are often associated with sexual offending by juveniles (Marshall & Barbaree, 1990). These include high rates of childhood sexual abuse victimization (Brown & Burton, 2010; Epps & Fisher, 2004;

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Knight & Sims-Knight, 2004; Widom & Massey, 2015; Worling, 1995b), association with

delinquent peers (Calhoun, Bernat, Clum, & Frame, 1997), high levels of hostility and hyper-

masculinity (Brown & Burton, 2010; Farr, Brown, & Beckett, 2004; Hunter, Figueredo, &

Malamuth, 2010; Knight & Sims-Knight, 2004; Zakireh, Ronis, & Knight, 2008), and

psychopathic features (Gretton et al., 2001; Leibowitz et al., 2012; Worling, 2001). There are

also a number of negative behavioral indicators present among JSAs, including substance abuse

(Brown & Burton, 2010; Johnson & Knight, 2000), aggression and impulsivity (Caputo, Frick, &

Brodsky, 1999; Smith, Wampler, Jones, & Reifman, 2005; Zakireh et al., 2008), and concurrent

delinquency (Brown & Burton, 2010; Ronis & Borduin, 2007).

Despite these associations, JSAs are a heterogeneous group (Driemeyer et al., 2011),

meaning there is no evidence to suggest that JSAs, as a group, share a cluster of symptoms or

behaviors which could be used to identify those at an elevated risk for becoming a JSA.

Furthermore, there are many young people who share any number of these factors who do not

become sexual abusers. For example, as noted, there is a strong association with childhood

victimization and later becoming a JSA, yet the majority of sexually abused youth do not commit

sexual offenses (Widom & White, 1997; Widom, 1999). This not only creates challenges for the

creation of targeted initiatives to prevent sexual abuse, but also for treatment and policies related

to sexual offending by juveniles.

Little knowledge has been generated regarding the assessment of risks for sexual

offending by JSAs. One reason for this is that much of adolescent sexual offending has

historically been dismissed as experimentation (Chaffin et al., 2008). However, as sexual

offending by juveniles has received increased attention by mental health professionals and policy

makers, so have the use of risk assessment tools (McGrath, Cumming, Burchard, Zeoli, &

Ellerby, 2010). There are two widely used risk assessment checklists: the Juvenile Sex Offender Assessment Protocol II (J-SOAP-II; Prentky & Righthand, 2003) and the Estimate of Risk of Adolescent Sexual Offense Recidivism (ERASOR; Worling & Curwen, 2001); and one actuarial measure: the Juvenile Sexual Offense Recidivism Risk Assessment Tool-II (J-SORRAT-II; Epperson, Ralston, Powers, DeWitt, & Core, 2006). While each tool is unique, the J-SORRAT-II and the J-SOAP-II focus on numerical scores and the ERASOR is designed as a guide to aid clinicians in assessing the collective risk of clustered factors. All three tools, which are widely used in North America (McGrath et al., 2010; Viljoen, McLachlan, & Vincent, 2010), use the risk characteristics additively, as the developers have found that interconnectedness among the characteristics collectively contributes to the relative risk of reoffending among JSAs.

These assessment tools use items that have been empirically associated with sexual and nonsexual delinquent reoffending among JSAs, including sexual crime characteristics, as well as characteristics associated with general delinquency. All three are moderately able to predict sexual reoffending by JSAs: authors of a recent meta-analysis calculated AUCs for total scores that ranged between .64 and .67 (Viljoen, Mordell, & Beneteau, 2012), just below the standard .70 cutoff (Hosmer Jr & Lemeshow, 2004). However, the authors also found that only 1.4–4% of the variance in sexual reoffending was accounted for among studies in which positive predictive ability for the tools was reported. Therefore, while these tools offer the utility of empirically guided aids to professional judgement [which is superior to unstructured professional opinion when it comes to re-offense risk (Hanson & Morton-Bourgon, 2005, 2009)], this utility is limited in the treatment landscape, as they tell us little about the heterogeneity of JSAs. One reason for this might be that the overlap in factors associated with general delinquency in these tools may

cloud heterogeneity in the factors that are specific to JSAs (Lussier et al., 2012; McCann & Lussier, 2008).

3.3 Sexual Crime Characteristics

To better understand heterogeneity among JSAs that does not overlap with general delinquency, some researchers have compared subtypes of JSAs according to their sexual crime characteristics.

Victim age. Victim age has been the most common sexual crime characteristic used in the literature to categorize JSAs, with at least 30 studies having done so at the time of this dissertation (see critical review by Keelan & Fremouw, 2013). Most researchers have done so by comparing two subtypes of JSAs: those with child-only victims and those with peer and/or adult-only victims. Fewer studies have also included a third group for comparison, called mixed offenders: JSAs with child *and* peer and/or adult victims (Fanniff & Kolko, 2012; Joyal, Carpentier, & Martin, 2016; Kemper & Kistner, 2007, 2010; Leroux, Pullman, Motayne, & Seto, 2016; Parks & Bard, 2006; Richardson, Kelly, Bhate, & Graham, 1997).

Examples of group differences include that researchers have consistently found that JSAs with peer and/or adult victims-only tend to be more forceful in their offending, and more violent in general (e.g. Hart-Kerkhoffs et al., 2009), those with child-only victims tend to commit fewer crimes (e.g. Hendriks & Bijleveld, 2004), while the findings about mixed offenders have been less robust on these issues (e.g. Gunby & Woodhams, 2010; Kemper & Kistner, 2010). Given that so many JSAs seem to choose victims based on accessibility (Kaufman et al., 1998; Worling, 1995a), it is unclear why victim type is the most researched category of JSAs. Much remains to be understood in the meaning of victim age.

Victim sex. While having a child male victim is predictive of repeat offenses among adult males (Hanson & Bussiere, 1998), the association of male victims to sexual recidivism risk among has JSAs been mixed (Seto & Lalumière, 2010; Worling & Langstrom, 2006). Many authors suspect that a good number of male victims among JSAs might be accounted for by access. That is, given the presence of other risk factors for committing a sexual offense, proximity of a male or female victim might play more of a factor in victim selection than sexual preference (Kaufman et al., 1996; Worling, 2001). However, with regard to heterogeneity of JSAs, the choice of a male victim might be a salient issue to better understand, as male victims are more likely among JSAs with child victims compared to those with peer or adult victims (Fanniff & Kolko, 2012; Gunby & Woodhams, 2010), or mixed offenders (Kemper & Kistner, 2007; Richardson et al., 1997) for reasons that are not yet clearly understood.

Sexual offense debut. The age at which a JSA commits his first offense has been given some attention in the literature, as early onset sexual offending is a risk factor for later criminal behavior (McCrory, Hickey, Farmer, & Vizard, 2008). With regard to victim access and the relationship of physical size to age (developmentally), it makes sense that JSAs with child-only victims tend to be younger than those with older victims (Aebi et al., 2012; Hart-Kerkhoffs et al., 2009; Hendriks & Bijleveld, 2004). Less clear is what other roles early offending might play in the heterogeneity of JSAs. Given that the mean age of first ejaculation has been estimated between 13 and 14 years old (Tomova, Lalabonova, Robeva, & Kumanov, 2011), the commission of a sexual offense prior to puberty seems relevant from a developmental perspective. To date, there is only one study in which an author compared the offense characteristics of JSAs who started their sexual offending prior to age 12 with those who started at age 12 or older (Burton, 2000). In it, JSAs who started younger were found to have committed

a greater variety of sexual offenses and displayed higher rates of force and penetration. This suggests that age of debut might play an important role in the complexities surrounding the heterogeneity of JSAs.

Use of penetration. While penetration is not considered a risk factor for sexual offense recidivism by JSAs or adults (Hanson & Bussiere, 1998; Hanson & Morton-Bourgon, 2005; Långström & Grann, 2000), it is noteworthy that the majority of sexual offenses committed by JSAs do not involve penetration (Finkelhor et al., 2009). Despite this, little is known about the role that penetration plays in the heterogeneity of JSAs, as few studies have reported on this detail. Burton (2000) found that penetration might be part of a progression of negative sexual behaviors, as youths in his study who penetrated their victims tended to start with exposure and fondling, but not all who fondled or exposed themselves progressed to penetrating. In a subsequent study, authors supported this finding with longitudinal data, as JSAs who began sexually offending younger than age 12 were found to have started with voyeurism and compulsive masturbation, and progressed to more serious offenses (Carpentier, Leclerc, & Proulx, 2011).

Use of force. The use of force in the commission of a sexual offense has shown to account for some heterogeneity of JSAs, explicitly and implicitly. JSAs considered to be at the highest risk of sexual and nonsexual criminal recidivism tend to be categorized by high levels of aggression and impulsivity, both of which are associated with the use of force (Burton, 2008; Johnson & Knight, 2000; Smith et al., 2005; Zakireh et al., 2008). However, this likely only tells part of the story, as already cited in this chapter, JSAs with peer/adult victims tend to use more force than those with child-only victims.

Planning sexual offenses. The planning of sexual offenses has not been explored in JSA literature. However, many authors have stressed the importance of assessing sexual preoccupation, which has led to its inclusion on two of the commonly used JSA risk assessments (J-SOAP-II, Prentky & Righthand, 2003; ERASOR, Worling & Curwen, 2001). Given that many JSAs score highly on measures of impulsivity (Johnson & Knight, 2000; Knight, Ronis, & Zakireh, 2009), which by definition indicates lack of planning, it is logical that JSAs who plan their offenses might look different than those who do not.

3.4 Pathways to Offending and JSA Typologies

Some researchers have acknowledged that exploring JSA heterogeneity by drawing comparisons of individual sex crime characteristics has its limitations, as this can sometimes overlook etiological indicators that might have led to offending. Estimating potential pathways to offending and JSA typologies are additional ways that heterogeneity among JSAs has been explored in the literature. Notably among these, Knight and Sims-Knight (2004) identified three factor-based pathways associated with becoming a JSA who has committed a sexual offense against an adult woman or peer: one path dominated by a preoccupation with sex or sexual deviance, one path dominated by high impulsivity and antisocial behaviors, and a third path dominated by feelings of callousness and unemotional traits. In a subsequent study, Knight, Ronis, and Zakireh (2009) found evidence to support these potential paths in different samples of adult sexual offenders and JSAs that were not victim specific, and added two additional pathways: one dominated by a history of violent behavior, and another dominated by a history of victimization. While these pathways have not yet been validated, the studies represent an important contribution to the JSA literature, as the authors have shown evidence that placing a high value on personality structure and behavioral histories might be important in the assessment

of JSAs. Nonetheless, it remains unclear what utilities these pathways offer to the prevention and treatment landscapes. As the authors pointed out, much more needs to be understood in differentiating JSAs.

Others have created typologies of JSAs that were rooted in theoretical assumptions of criminality, largely driven by mental health and personality (Hunter et al., 2003; O'Brian & Bera, 1986; Prentky, Harris, Frizzell, & Righthand, 2000; Worling, 2001). The authors of one compelling study found distinct typologies between JSAs without concurrent criminality (sex-only) and JSAs with concurrent criminality (sex-plus; Butler & Seto, 2002). In it, the authors found that sex-only JSAs had significantly fewer conduct problems and risks for future delinquency than their sex-plus JSA counterparts, who resembled criminally versatile youths who scored higher on risk indicators for general delinquency. Does this suggest that sex-plus JSAs are general delinquents who happen to commit a sexual crime among a constellation of delinquent acts, whereas sex-only JSAs represent a subtype that commits sexual abuse for reasons unrelated to general delinquency?

To date, theoretically informed typologies of JSAs such as these have yet to be empirically validated. One reason for this may be the overlap in social, psychological, and behavioral indicators observed in comparisons with general delinquents (Brown & Burton, 2010; Burton, Leibowitz, & Howard, 2010; Butler & Seto, 2002; van Wijk et al., 2005). Aebi and colleagues (2012) suggested that another reason for this might be that the subgroups tend to have similar treatment needs. To resolve this issue, they tested the validity of three dichotomous JSA types using offense and offender specific variables found to be empirically noteworthy elsewhere in the literature. The three groups tested were: those with a child victim compared to those with no child victim (e.g. Parks & Bard, 2006), those who sexually offended in groups to those who

sexually offended alone (e.g. Bijleveld & Hendriks, 2003), and those who had a history of nonsexual criminality and those who did not (e.g. Butler & Seto, 2002). They found the strongest evidence for typing JSAs by the ages of their victims, but determined that the differences within these groups might be better explained by a dimensional approach to subtyping JSAs rather than a classification system.

3.5 Family Factors

In the etiology of JSAs, some researchers have found that it is not enough to simply look at the individual factors associated with sexual offending, but to also consider the context of the offenders' lives. The families of JSAs have been found to face multiple concurrent problems (Yoder & Brown, 2015). Families of JSAs are characterized as having high rates of neglect and inadequate monitoring of children (Awad & Saunders, 1991; Knight & Sims-Knight, 2004; Saunders, Awad, & Levene, 1984; van Wijk et al., 2005), single-parent structures that are usually female-headed (Becker, Cunningham-Rathner, & Kaplan, 1986; Rich, 2005; Saunders et al., 1984; van Wijk et al., 2005), high levels of substance abuse (Barbaree & Marshall, 2006; Ford & Linney, 1995; Knight & Sims-Knight, 2004; Lightfoot & Barbaree, 1993; Saunders et al., 1984), youths witnessing the physical abuse of other family members (Caputo et al., 1999; Saunders et al., 1984), high levels of adult criminality (Baker et al., 2003; Caputo et al., 1999), and a lack of resources to cope with the effects of abuse and neglect once disclosed (Barbaree & Marshall, 2006; Ford & Linney, 1995; Lightfoot & Barbaree, 1993; Vizard, Hickey, & McCrory, 2007).

In one small sample study ($N = 43$), authors found higher levels of violence and criminality among adults in the homes of JSAs with peer-only victims compared to those with child-only victims (Gunby & Woodhams, 2010). From these findings, it seems possible that there are some JSAs with peer-only victims who seem to commit sexual offenses as part of a

cluster of violent and antisocial behaviors that are related to antisocial modeling in their homes, while those with child-only victims might be more likely to offend for other reasons.

While these investigations have contributed a great deal to uncovering etiological indicators for becoming a JSA, a challenge to using these indicators alone is that, as with the psychological, behavioral, and other social indicators, similar familial characteristics have been found to be highly influential in the development of young people who commit nonsexual delinquent crimes (Haas et al., 2004; Loeber & Farrington, 2000). Despite the robust evidence to show that family problems are highly associated with sexual offending, no research has yet thoroughly explored how subtypes of JSAs might differ on factors related to family.

Attachment. Given the high degree of familial problems associated with adult and juvenile sexual abuse, a fair amount has been written on the relationship of intimacy and attachment to sexual offending in adults and juveniles (Cortoni & Marshall, 2001; Laws & Marshall, 1990; Lyn & Burton, 2004; Marshall, 2010; Miner et al., 2016; Rich, 2005; Righthand & Welch, 2004; Ryan, 1999; Smallbone, 2006), as authors have suggested that deficits in attachment might help explain underlying developmental challenges that contribute to sexual offending. Attachment theory posits that children form relationships with primary caregivers, beginning in infancy, that are necessary for protection and comfort (Bowlby, 1977). These attachments become internalized and give children working models for their beliefs, attitudes, and behavior in future relationships. When the quality of attachment with a primary caregiver is strong, children are more likely to form secure bonds with others. When primary caregiver attachments become disrupted through abuse, neglect, or abandonment, this can lead to insecure, anxious, and disorganized attachments (Ainsworth, 1985), which often endure throughout the lifespan (Sroufe, Carlson, Levy, & Egeland, 1999).

When compared to general delinquents, JSAs have been found to have greater deficits in maternal attachment (Yoder et al., 2016) and relating to opposite-sex peers (Miner et al., 2010). However, only two peer-reviewed studies have explored how attachment characteristics with parents might affect discriminant characteristics of JSAs, finding that lower levels of attachment with mother are independently associated with more severe offenses, a greater number of victims, and more nonsexual criminality (Miner et al., 2016; Yoder et al., 2016). With such high levels of family problems in the families of JSAs, the role if attachment may aid in understanding the complex dynamics created by deficits in other areas of family functioning.

3.6 Mental Health

In addition to family contexts, there is reason to believe that, for some JSAs, there is a biological association to sexually abusive behaviors. For many years, psychopharmacological treatments associated with impulsivity, depression, and anxiety have been commonly used in conjunction with psychotherapy to treat JSAs and adult sexual offenders (Briken & Kafka, 2007). This is logical, as challenges with managing impulsivity have been long been associated with sexual offending by adults (Robertiello & Terry, 2007) and JSAs (Burton, 2008; Prentky et al., 1989; Smith et al., 2005). Furthermore, many problem sexual behaviors, including sexual offending, are considered by some researchers and theorists to be in the service of managing dysphoric affectual symptoms, such as anxiety and depression (Kafka, 2010; Sealy, 2002).

A number of researchers have found antisocial personality characteristics to be prominent among some JSAs (Hunter et al., 2010; Johnson & Knight, 2000; Knight et al., 2009; Knight & Sims-Knight, 2004; Worling, 2001). While these findings are useful in uncovering some heterogeneity among JSAs, it is risky to draw conclusions about the personalities of adolescents, who are in a nearly constant state of change in terms of cognitive and physical development

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(Grisso, 1998). Furthermore, it is possible that JSAs, who are more likely than youths in the general population to have been sexually abused (Burton, 2003), would perform atypically on personality measures due to the possible trauma associated with being victimized. Among adults, the experience of childhood sexual victimization is strongly correlated with atypical scores on personality measures (Elhai et al., 2004).

Another problem with relying on personality characteristics to draw conclusions about JSAs is that the behavioral and attitudinal indicators (e.g. fighting or misogynistic attitudes) observed are possibly symptoms of an affective disorder or a family problem (e.g. depression or domestic violence) not captured by such measures. In their meta-analysis of 59 studies comparing JSAs to general delinquents, Seto & Lalumière (2010) found JSAs to have significantly higher levels of clinical anxiety and low self-esteem, and non-significantly higher levels of depression. This suggests that the role of mental health among JSAs might be important to the prevention of sexual offending and treatment of JSAs. If some JSAs are more prone to anxiety or depression, for example, early screening and treatment might aid in preventing a youth from committing his first sexual offense.

There has been scant research on affective mental health heterogeneity among JSAs. Some researchers have found that those who have child-only victims only tend to exhibit more psychopathology, such as anxiety and depression, than those with peer and/or adult victims (Hart-Kerkhoffs et al., 2009; Hendriks & Bijleveld, 2004). In a recent, small sample dissertation study ($N = 60$), the author was unable find significant differences between two subgroups of JSAs on measures of attention deficit hyperactivity disorder, conduct disorder, or oppositional defiant disorder (McCall, 2016). Clearly, more research with larger samples must be done to better uncover the role mental health pathology might play for some JSAs.

3.7 Concurrent Delinquency

It has been well established that JSAs are far more likely to recidivate with a nonsexual crime than a sexual one (Burton & Meezan, 2004; McCann & Lussier, 2008), which has led some to suggest that the commission of sexual abuse is simply one in a constellation of antisocial behaviors among otherwise highly delinquent youths (Righthand & Welch, 2004). However, many others disagree. For example, Butler and Seto (2002) found that JSAs were similar to general delinquents in conduct problems, behavioral adjustment, and antisocial attitudes and beliefs, but showed a lower risk for future delinquency. Furthermore, the authors of two widely cited meta-analyses (Seto & Lalumière, 2010; van Wijk et al., 2006) reported that a number of clear differences have been found to distinguish JSAs from general delinquents, including an expressed interest in rape-supportive attitudes, greater sexual abuse victimization, and less substance abuse, while poor parental attachment and family communication problems did not. However, these authors also acknowledged that methodological challenges and inconsistencies across studies resulted in profound limitations for drawing generalizable conclusions.

In a more recent study, van der Put and colleagues (2013) compared non-sexually offending general delinquents to three subtypes of JSAs: those with non-contact offenses upon adults and/or peers; those with contact offenses upon adults and/or peers; and those with child victims. Looking at risk factors for criminal nonsexual recidivism, they found that JSAs with non-contact offenses upon adults and peers and general delinquents scored similarly, and at significantly higher rates, when compared to JSAs with contact offenses against peers/adults and to those with child victims, who also scored similarly. This suggests that subtyping JSAs according to the severity of a sexual offense might be most appropriate for targeting treatment needs. For example, it is possible that youths with contact offenses and those with child victims

need treatment targeting impulses related to sex-specific behaviors, while those with noncontact offenses need a treatment focus on antisocial tendencies more generally. However, in order to gain a more robust understanding of the problem of sexual offending by JSAs and how to best identify and intervene with those at risk of committing future offenses, it is clear that more research must be done.

3.8 Summary of Limitations and Contributions of Present Study

There are a number of limitations worthy of addressing in the current literature, including multiple studies with small sample sizes and geographical limitations of samples.

Previous attempts to understand pathways to sexual offending and typologies among JSAs have been challenged by an overlap with indicators that are strongly associated with general delinquency. Given this, there are notable challenges in identifying those needs that are specific to JSAs, as well as to understanding the deeper heterogeneity of the population.

There is also a methodological gap in the JSA literature, as nearly all extant studies of JSA subtypes include a priori assumptions of outcomes (e.g. child victims vs. no child victims, sex-only vs. sex-plus, use of force vs. no use of force, etc.). In other words, the authors' interpretations of JSA subtypes have explained how the variables hold together in relationship to one another, rather than how the variables describe classes of JSAs who might present for treatment on a variety of factors, and allowing these classes to predict future outcomes. Tautological analyses such as these represent important steps forward in modeling multiple risks associated with sexual abuse by JSAs, but have often done so in a non-linear manner. A disadvantage to these approaches is that all risk factors are weighted equally and assumed to be interchangeable (Lanza, Rhoades, Nix, & Greenberg, 2010), meaning that the exposure to any risk factor is equal regardless of how well related they are. Furthermore, such approaches have

tended to overlook that all JSAs are in a developmental stage marked by vast and rapid change, and therefore require analyses that emphasize interactive factors to distinguish qualitatively different groups of individuals (Bergman & El-Khouri, 2003).

There is little, if any, disagreement that youths presenting with high levels of family problems and complex mental health histories confer a high probability of future problems (Keller, Cusick, & Courtney, 2007), including the possibility of becoming a JSA. Furthermore, the evidence is clear that JSAs display a variety of divergent pathways. A probabilistic perspective, rather than deterministic, implies that single factors are neither necessary nor sufficient causes for problems and that a single factor might result in different outcomes in different individuals (Cicchetti & Cohen, 1995; Sroufe, 1997): common experiences may interact in individuals differently, resulting in different outcomes. Nevertheless, few authors have investigated the data-driven heterogeneity of the JSA population without a priori assumptions in which implicit meaning is attached to the outcome.

An additional feature of extant JSA studies is that certain sexual offense variables (e.g. victim age) have been used as isolated indicators to test subtypes (Aebi et al., 2012; Fanniff & Kolko, 2012). A probabilistic perspective on JSA outcomes implies that individuals are not well-suited for being identified by such indicators alone. Rather, the interaction of multiple contributing factors presents a more comprehensive identification (Cicchetti & Cohen, 1995; Sroufe, 1997). As JSAs develop throughout adolescence, there will be a variety of interactions and mutual influences among indicators. For example, some authors have found that having a preoccupation with sex is a risk factor for sexual abuse recidivism among JSAs (Viljoen et al., 2012). It is easy to imagine that such a preoccupation might carry a particularly heightened risk among JSAs from families characterized by high levels of substance abuse and antisocial

behaviors (Barbaree & Marshall, 2006; Ford & Linney, 1995; Knight & Sims-Knight, 2004; Lightfoot & Barbaree, 1993; Saunders et al., 1984). Likewise, for a JSA in a supportive environment that nurtures his interests and creative thinking, with prosocial parents who set appropriate sexual boundaries, it is easy to imagine that a preoccupation with sex might lead to an interest in the study of human sexuality, social psychology, sexual abuse prevention, or any variety of prosocial opportunities that indulge an atypical heightened interest in sexual behavior. Therefore, as is true in studies of other troubled adolescents (Keller et al., 2007), the etiology of JSAs is best understood using analyses that simultaneously incorporate multiple domains of life experience.

Development in adolescence is characterized by states that change over time. Each state is a specific configuration of a system at a given moment in time (Bergman & Magnusson, 1997). The use of a person-centered approach to analysis, such as latent class analysis, assumes that each factor derives meaning in relationship with all other factors (Laursen & Hoff, 2006; Magnusson, 1998). Other person-centered approaches to JSAs have used sophisticated cluster analyses to identify a small number of subgroups composed of individuals with different risk profiles (Guay, Ruscio, Knight, & Hare, 2007; Hunter et al., 2010, 2003; Knight et al., 2009). However, as the number of individual risk factors increases, the number of risk profiles increases exponentially and can be of little or no use in terms of practical application (Lanza et al., 2010).

The proposed study intends to deepen extant research on JSA heterogeneity by using indicators already found in the literature to be correlated with sexual offending among JSAs to identify latent classes of JSAs through a person-centered approach that is consistent with a holistic perspective on individuals, considers context more deliberately in the lives of JSAs (Magnusson, 1995), and assumes population heterogeneity in relationship to the variables of

interest (Laursen & Hoff, 2006). Thus, empirical classification of JSAs will be based upon

qualitatively common profiles.

CHAPTER 4

RESEARCH QUESTIONS AND HYPOTHESES OF THE DISSERTATION

Based in previous research on juveniles and adults who have committed acts of sexual abuse, as well as juvenile delinquents, and guided by rational choice theory and social learning theory, the present study was designed to address gaps in knowledge regarding the heterogeneity of juvenile sexual abusers. Using cross-sectional data gathered from male adolescents living in six secured juvenile detention centers in two states, this study was designed to address three specific questions: 1) Do latent classes of JSAs emerge based on sexual crime characteristics? 2) What is the relationship between classes of JSAs derived from their sexual crime characteristics with their family contexts, mental health, and concurrent delinquency? 3) Can JSAs be classified more broadly according to sexual crime characteristics, family contexts, mental health, and concurrent delinquency? That is, is it possible to clearly identify latent classes using sexual crime characteristics along with variables for family context, mental health, and concurrent delinquency?

4.1 Research Question 1

Q1. Do latent classes of JSAs emerge based on sexual crime characteristics?

Hypothesis 1: Three or more latent classes would be well identified on the basis of sexual crime characteristics alone. This type of latent class analysis is exploratory in nature and therefore specific differences among the classes were revealed by the data, not hypothesized a priori (Hoijtink, 2001; Laudy, Boom, & Hoijtink, 2005). This hypothesis was supported.

4.2 Research Question 2

Q2. What is the relationship between classes of JSAs derived from their sexual
crime characteristics with their family contexts, mental health, and concurrent
delinquency?

Hypothesis 2: Differences in class assignment would be found on the basis of family
contexts, mental health, and concurrent delinquency. Based on social learning theory, it was
hypothesized that those with high levels of family problems would be present in one or more
classes, and that the majority of the sample would show clear evidence of challenges in the
family, as problems in families have been robustly associated with delinquency and sexual
aggression in youth in previous research (e.g. Johnson & Knight, 200; Kazemian et. al, 2011).
This hypothesis was partially supported.

It was also hypothesized that mental health symptoms would be present in one or more
classes, accounting for a minority of the sample. This hypothesis was partially supported.

Finally, building on Butler and Seto's work (2002), it was hypothesized that JSAs who
committed only sexual offenses would appear in one unique class that represented the lowest
proportion of the sample. This hypothesis was not supported.

4.3 Research Question 3

Q3. Can JSAs be classified more broadly according to sexual crime characteristics,
family contexts, mental health, and concurrent delinquency? That is, is it possible to clearly
identify latent classes using sexual crime characteristics along with variables for family
context, mental health, and concurrent delinquency?

Hypothesis 3: Three or more latent classes would be well identified on the basis of sexual
crime characteristics, as well as family, mental health, and concurrent delinquency. It is

hypothesized that a change in class composition from question one will be observed. This latent class analysis is exploratory in nature and therefore specific differences among the classes would be revealed by the data, not hypothesized a priori (Hoijtink, 2001; Laudy et. al, 2005). This hypothesis was partially supported.

4.4 Research Questions in Lay Terms

To understand the research questions as written, some knowledge of social science research methodology is necessary. However, to understand the substance of these questions, no esoteric training or knowledge is required. In summary, JSAs in research have often been subtyped by authors' comparisons of those who have committed a certain type of sexual crime (e.g. an act of penetration) to those who have not. In reality, JSAs are often more complex than a single sexual crime characteristic might reveal. In question 1, I asked if it was possible to identify subtypes of JSAs by looking at multiple sexual crime characteristics at the same time, where one subtype of JSAs might be identified by a specific combination of sexual crimes, while others by different combinations. This way, there would be an overlap among subtypes with regard to individual sexual crime characteristics, although each subtype would be identified by a unique combination of sexual crimes. In question 2, I asked: If these subtypes exist, what are their differences in family backgrounds, mental health, or nonsexual criminal behaviors? In question 3, I attempted to create new subtypes using information from the first two questions. In addition to the sexual crime characteristics from question 1, I added items about family backgrounds, mental health, and nonsexual behaviors.

CHAPTER 5

METHODS

5.1 Study Design and Data

Data from three studies designed to explore the etiology of youth sexual offenders were combined to address this series of research questions. In 2004 and 2009, data were collected from males adjudicated for sexual offenses and living in five secured juvenile detention centers in a Midwestern state. In 2011, data were collected from male sexual abusers living in a secured detention center in a Mid-Atlantic state. Data for the current study were collected confidentially among nonrandomized convenience samples, using cross sectional paper surveys. Guided by developmental-ecological and psychological models of risk and protection, the youths completed surveys that focused on individual (e.g., exposure to violence, criminal behavior), family (e.g. single-parent home, parental substance abuse), and psychological factors (e.g. depression, anxiety).

5.2 Sample and Data Collection

After the assents and consents were obtained, the data were collected in small groups of 8–12 participants within the facilities. The youths were kept far enough apart so they could not read each other's responses. The surveys were read to 12 boys who had reading challenges. In 2009, I participated in data collection; I assisted in preparing the survey packets and travelled to all sites for survey administration over a one week period. In all cases, the youths were monitored by trained graduate students, professional social workers, or social work faculty, as well as the staff of the facilities. No incentives were provided to the youths to complete the surveys.

5.3 Data Analytic Sample

The sample in this set of analyses consisted of 573 male youths who were between the ages of 11 and 20 years and, on average, had completed the 9th grade (see Table 5.1). Consistent with other studies of youths convicted of sexual crimes (e.g. Craun & Kernsmith, 2006; Burton & Ginsburg, 2012), those who identified racially as White represented a greater proportion than any other single racial group, with nearly half the youths reporting their race as White or Caucasian, and approximately one third reporting their race as Black or African American (see Figure 5.1). Because the total number of those reporting races other than Black or White was relatively small, race was dummy-coded in later analyses.
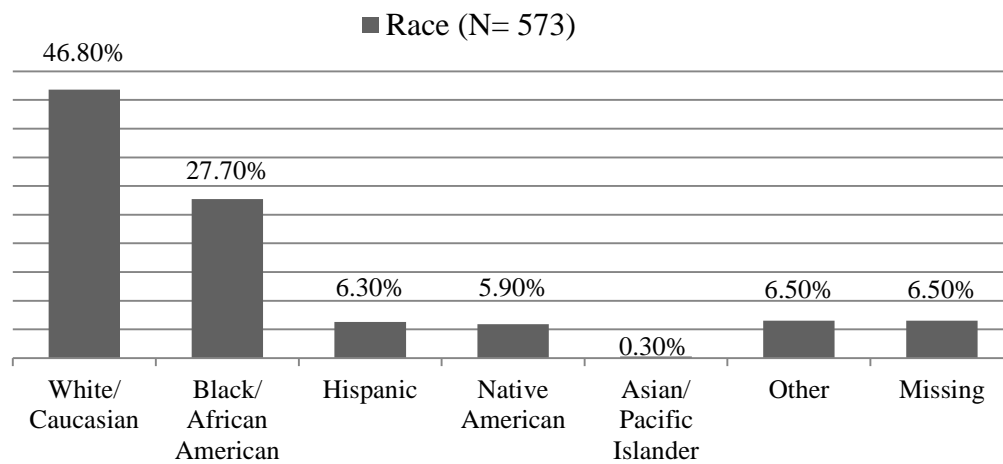
Figure 5.1 Race of the sample

Table 5.1

Age and Grade of Sample (*N=573*)

Age (*M* = 16.75, *SD* = 1.72)		
	n	*%*
11	1	0.2
12	2	0.3
13	11	1.9
14	40	7.0
15	79	13.8
16	113	19.7
17	121	21.1
18	99	17.3
19	53	9.2
20	35	6.1
Missing	19	3.3

Last Grade Completed (*M* = 9th, *SD* = 1.52 grades)		
	n	*%*
6th	16	2.8
7th	36	6.3
8th	99	17.3
9th	150	26.2
10th	98	17.1
11th	74	12.9
12th	73	12.7
GED	7	1.2
Some college	2	0.3
Missing	18	3.1

5.4 Measures

5.4.a. Sexual Crime Characteristics

Sexual assault victim selection. JSAs were asked to provide the sex of each victim, as well as the ages of their victims. Optimally, the classification of having a child victim should be made according to the victim's pubertal status rather than chronological age (Seto, 2002), but it is not possible to collect this information accurately under most circumstances. In their recent review of 21 studies in which authors compared JSAs based on the ages of their victims, Keelan

and Fremouw (2013) pointed out the lack of a standard definition for child victim across studies. One study of JSAs defined child victims as age 10 or younger, regardless of the age of the JSA (Epps, 2000), while the majority of studies have defined child victims in relation to the JSA, with most using a range of 3 to 5 (or more) years younger than the JSA (see meta-analysis by Seto & Lalumiere, 2010).

In the current study, participants were asked to report the age of their youngest victim and the age of their oldest victim, as well as their own ages the first time they sexually abused someone and the last time they sexually abused someone. My first attempt to distinguish child from peer and adult victims using these variables was complicated by the fact that many participants had numerous victims and it was not always clear how old any given victim was in relationship to the JSA at the time of the sexual assault. For example, one JSA reported his youngest victim to be 13 years old, his sexual offense debut as age 13, his oldest victim as 17 years old, and his last offense at age 17. It is possible that this was the same victim abused over a four year period, meaning he would have a peer and/or adult victim-only. However, if at age 17, he had a second 13-year-old victim, then he should be marked as having a child victim. Without greater specificity regarding the ages of specific victims in relationship to the ages of the JSAs at the time of their sexual assaults, there was too much uncertainty in these data to comfortably categorize this way. Therefore, a conservative estimate of child victims was calculated using one of two criteria: 1) having any victim under age 11 or 2) when the age of the JSA's last offense was four or more years greater than his oldest victim. For example, if the JSA reported his last offense to have occurred when he was 16 and his oldest victim was 12, he would have been counted as having a child victim.

Debut of sexual assault perpetration. The youths were asked "How old were you the first time you sexually abused someone?" They were categorized into two groups: sexual assault perpetration debut under age 12 and sexual assault perpetration debut older than age 11.

Use of penetration and/or force in a sexual assault. To determine whether or not the respondents penetrated their victims (orally, genitally, or anally) in the act of a sexual assault, responses were recorded from the Self-Report Sexual Aggression Scale (SERSAS), a seven point perpetration scale used in other juvenile sexual abuser research (Burton et al., 2002; Burton, 2003; Burton, Duty, Leibowitz, 2011) indicating the severity or complexity of sexual crimes committed: (1) exposed yourself to them or made them expose themselves to you; (2) made them watch you in a sexual act (intercourse, oral sex, masturbation); (3) fondled their private parts or made them touch your private parts; (4) made them perform oral sex on you or you performed oral sex on them; (5) made them put their fingers, objects, or penis into your private parts; (6) put your fingers, objects, or penis into their private parts; (7) made them do anything sexual to/with animals. Responses from these items were used to categorize youths into two groups: those who committed an act of penetration and those who had not.

Immediately following this set of questions, a rank-order scale of modus operandi was given with the prompt, "How did you get them to do what you wanted?" and answer choices, (1) "Offered them favors such as being very nice to them or giving them candy, playing games to get them to like you, etc.;" (2) "Made threats of harming them or others (i.e., their family or friends.);" (3) "Used physical force." Responses from these items were used to categorize youths into two groups: those who reported using physical force and those who had not.

Missing data: Sexual crime characteristics. For some participants, missing items for sexual crime characteristics were imputed using full information maximum likelihood (FIML) in

latent class analyses, described in greater detail later in the chapter. It is worth noting that the rate of missing observations on sexual crime characteristics was higher than other variables in the study, ranging from 2.4% to 25.3%, and higher than most studies of JSAs. (See Table 6.1 for rates of missing items on sexual crime characteristics.) One possible reason for this is that the current study used self-report data, whereas authors of extant research on JSAs have tended to rely on administrative data or clinical records for information related to sexual crime characteristics (Aebi et al., 2012; Hendriks et al., 2015; Hunter et al., 2003; Kemper & Kistner, 2007, 2010; Lussier et al., 2012; Parks & Bard, 2006; Worling & Langton, 2015; Worling, 1995a). However, the current study has strengths regarding these sexual crime characteristics that those using administrative or clinical data do not share.

A drawback of relying on administrative data for sexual crime characteristics, as most authors have done, is that such data are often limited to adjudicated sexual offenses, thereby potentially failing to identify robust details related to the participants' sexual offense histories. This is likely a reason why most studies, unlike the current study, do not include a category for JSAs with mixed-victim types (i.e. those with both child victims and peer and/or adult victims).

A drawback of using clinical data in JSA studies is that these tend to be limited by smaller sample sizes, often ranging from 50 to 80 participants (e.g. Worling & Langton, 2015; Worling, 1995). Small sample sizes, as pointed out by Kemper and Kisner (2010), result in small comparison groups of sexual crime characteristics, and particularly between the peer and/or adult victim-only category and the mixed-victim category when both appear in a study. Furthermore, while clinical data is more likely to procure richer information than administrative data with regard to sexual crime characteristics, such information is limited by what was available to the clinician at the time the instrument is used, rather than coming directly from the JSA, as in the

current study. Therefore, the results related to sexual crime characteristics in the current study are uniquely positioned to make an important contribution to the literature.

Despite the higher levels of missing data on sexual crime characteristics, the findings can be interpreted with a high degree of confidence, as the rates of the most commonly studied sexual crime characteristic, victim age, were similar to those observed in other studies. Specifically, the rates of those who reported child victims in the current study (62%) compared to those who had peer and/or adult victims (31%) were similar to other studies of JSAs (Fanniff & Kolko, 2012; Joyal et al., 2016; Kemper & Kistner, 2007, 2010; Leroux et al., 2016). With fewer studies to draw from containing a mixed victim category, there has been much greater variance in previous research, with rates ranging from approximately 7% (Kemper & Kistner, 2007, 2010) to 20% (Parks & Bard, 2006; Richardson et al., 1997). The results in the current study fall within this range (17.1%). It is also important to note that the current study's sample size ($N = 573$) is approximately four times the size of most JSA studies, and nearly double those of Kemper and Kistner (2007, 2010), which are the next largest studies to include all three victim age categories ($N = 296$).

5.4.b. Family

Youths were asked to describe the families in which they were raised in the context of custodial guardianship (e.g. two parents, single mom), as well as whether or not their families and/or homes exposed them to mental illness, substance abuse, physical abuse and neglect, antisocial behavior by adults, and poverty. Separately, youths were asked if they ever lived in foster care or were placed in a group home. This allowed for a distinction between youths who were raised in foster care or a group home and those who were placed in foster care or a group home.

Parental attachment. Point-in-time attachment was measured using the revised version of the Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987). Widely used in social science research (Blain, Thompson, & Whiffen, 1993; Capaldi & Stoolmiller, 1999; Coleman, 2003; Cotterell, 1992; Meeus, Oosterwegel, & Vollebergh, 2002; Papini, Roggman, & Anderson, 1991; Rhodes, Grossman, & Resch, 2000), the measure was framed by Bowlby's theory of attachment, which suggests that people are most well-adjusted when they are confident in the accessibility and responsiveness of a primary caregiver. In their review of attachment measures, Lyddon, Bradford, & Nelson (1993) described the IPPA as highly reliable.

The IPPA uses a five-point Likert-scale on items with responses ranging from (1) "Never true" to (5) "Always true." The 25-item mother scale included questions such as "My mother respects my feelings" and "I feel my mother does a good job as my mother." Subscales for the mother scale are Trust, Communication, and Alienation. After reverse-coding negatively worded items, the total attachment scores, used in the current study, were computed by summing item responses for all subscales. Higher scores indicated higher degrees of healthy attachment. (See Appendix A for details on the items relevant to the IPPA.)

As recommended by the authors of the measure, youths completed separate scales for mother and father. Among clinical samples of youths, results from the parent scales of the IPPA have been linked to mental health pathology, including depression (Greenberg & Armsden, 2009). For reasons that are unclear, there was a great deal of missing data for the father scale, making interpretation of the father scale challenging. Other studies have found the mother scale of the IPPA to have a relationship with mental health symptomology, while the father scale did not (DiFilippo & Overholser, 2000). In the current study, internal consistency for the mother scale of the IPPA was 0.95.

Although designed to be used as a scale, some researchers have created categories of attachment with the IPPA. For example, Black & McCartney (1997) used the Trust, Alienation, and Communication subscales to label attachment styles, identifying youths in their study as having high security or low security. Later, Vivona (2000) also used the three subscales to label individuals with avoidant attachment or ambivalent attachment. Authors have also created categories of attachment with the IPPA using factorial derived subscales which calculated summary scores relative to other members of their samples, as was done in the current study. For example, Sund & Wichstrom (2002) used the total IPPA score and divided their sample into quartiles, ranging from least secure to most secure. Black and McCartney (1997) used the total IPPA scores to divide their sample into three, equally distributed groups, and labeled them low, moderate and high attachment. McKinney (2002) also used the total IPPA scores, but created a larger moderate attachment group, having used the mean score and one standard deviation above and below the mean as cut points to compare groups.

In this study, I was interested in understanding attachment to mother as a possible indicator of overall wellbeing. I was also interested in understanding the possible role of attachment as a latent property in classes of JSAs. The interpretation of latent class analysis becomes challenging when using count variables (Masyn, 2013) and dichotomizing is preferred when possible. Given this, McKinney's method of choosing cut points derived from the mean and standard deviations made the most sense in these analyses. In McKinney's study, the mean score on the mother scale in a community-based adolescent sample was 102.92 ($SD = 15.58$). Coleman (2003) found a similar result on the mother scale ($M = 101.70$, $SD = 15.06$) in a community-based sample of younger adolescents. In contrast, DiFilippo and Overholser (2000) found notably lower average scores and broader distributions on the mother scale of the IPPA in

a study of psychiatrically hospitalized adolescents (M = 83.00, SD = 23.59). The sample in the current study, which was neither clinical nor community-based, showed a mean score that fell squarely between the community-based samples and the inpatient sample, with a mean of 94.20 (SD = 23.60).

Missing data: IPPA. Nearly one third of the sample (n= 151, 26.3%) had incomplete data on the mother scale of the IPPA (see Table 5.2). However, of the 151 participants who were missing at least one item, more than two-thirds were only missing between one and three of the 25 items (n= 96, 63.6%), while an additional six participants were missing more than three items, but fewer than half. In weighing the potential bias introduced by imputing data on this measure against the loss in statistical power by dropping participants who were missing at least one item (Enders, 2010), I compared the inter-item covariance (.84) and internal consistence reliability (α = .95) of this scale on those with complete data to those who were missing at least one item but fewer than half. No differences were found. Therefore, I was able to confidently retain approximately 18% of the 26% of participants who were missing data on this scale by imputing items for these participants.

While more sophisticated methods for data imputation were used in subsequent analyses, the similarity in inter-item covariance led me to conclude that person-mean imputation was adequate, as this remains a commonly advised method in studies that include questionnaire data (Eekhout, de Boer, Twisk, de Vet, & Heymans, 2012). Therefore, for each participant who answered at least 13 items and fewer than 25 items (n = 103, 18.0%), a mean item score was calculated for his given responses and imputed onto his missing items.

In summary, JSAs were counted as missing on the attachment measure were if they answered fewer than 13 items (n= 48, 8.38%). Among youths who answered at least half of the

questions ($n= 525$), the mean total score of attachment to mother was 94.20, with a standard deviation of 23.60. Therefore, the three categories and cut scores used for analyses were: low attachment (below 70.6), moderate attachment (between 70.6 and 117.8), and high attachment (above 117.8).

Table 5.2.

Number of Missing Items on Attachment Measure

Items completed (out of 25)	Number of respondents ($N = 573$)	% of sample
25	422	73.7
24	64	11.2
23	19	3.3
22	13	2.3
21	2	0.4
20	2	0.4
17	1	0.2
16	1	0.2
13	1	0.2
5	1	0.2
3	1	0.2
1	1	0.2
0	45	7.9

5.4.c. Mental Health

Depression and anxiety were measured using the Millon Adolescent Clinical Inventory (MACI; Millon, 1993)**,** one of the most widely used tools for forensic juvenile populations among both researchers (Baum, Archer, Forbey, & Handel, 2009) and clinicians (Archer, Buffington-Vollum, Stredny, & Handel, 2006; Archer & Newsom, 2000). It was normed on 579 adolescents in forensic settings with two smaller cross validation samples. The scales are derived from the 160 true-false items based on Millon's theory of personality and the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-III;* American Psychiatric Association, 1980)

criteria (Millon, 1981), but with a focus on clinical symptomology unique to teenagers (McCann, 1997). According to the *MACI Manual, Second Edition* (Millon, 2006), diagnostic criteria for mental health conditions differ somewhat from the *DSM-IV-TR* (American Psychiatric Association, 2000), although parallels between MACI scales, including depression and anxiety, are sufficient to warrant clinical consideration. For each clinical syndrome, base rate scores were standardized and cut points were created to categorize youths into two groups: present or not present.

Depression. The depressive affect scale of the MACI was used to assess depression. This 33-item scale was found to have strong internal consistency on the development sample (.89), and on both cross validation samples combined (.88). There was a .81 test-retest agreement between subsets of both the development and cross-validation samples. After items were weighted, raw scores were summed and transformed into base rates. Youths with base rates greater than 75 matched the target proportion of adolescents for whom the characteristic was present. (See Appendix A for details on the items relevant to the depressive affect scale.)

Anxiety. The anxious feelings scale of the MACI was used to assess anxiety. This 42-item scale was found to have strong internal consistency on the development sample (.75), and on both cross validation samples combined (.75). There was a .85 test-retest agreement between subsets of both the development and cross-validation samples. After items were weighted, raw scores were summed and transformed into base rates. Youths with base rates greater than 75 matched the target proportion of adolescents for whom the characteristic was present. (See Appendix A for details on the items relevant to the anxious feelings scale.)

5.4.d. Nonsexual Delinquency

Items from the Self-Reported Delinquency (SRD) scale were used to assess nonviolent nonsexual delinquency and violent nonsexual delinquency (Elliott, Huizinga, & Ageton, 1985). The SRD asks how many times the respondent engaged in the listed activity during the year before they came to prison. Example items included: "purposely damaged or destroyed property belonging to my parents or other family members," "stole or tried to steal something worth more than $100," and "used force or strong-arm methods to get money or things from people." Participants responded to each item on a scale ranging from 1 (did not do) to 7 (2-3 times a day; See Appendix A for details on the items relevant to nonviolent and violent delinquency.)

Nonviolent nonsexual delinquency. Twenty four items from the SRD were used to assess nonviolent delinquency. Items included petty and grand larceny, property destruction, burglary, auto theft, and use of controlled substances. As this variable was intended to assess nonsexual nonviolent delinquency in the current study, three questions on the SRD related to sexual behavior (one for obscenity and two for prostitution) were dropped. An additional question regarding tobacco use was also dropped, as this is not considered delinquent behavior for those who were age 18 and older at the time of data collection. Youths who responded with 2 (once a month) or higher on any of the 21 SRD items measuring nonviolent delinquency were coded as having engaged in nonviolent delinquency.

Violent nonsexual delinquency. Violent delinquency was assessed with four items from the SRD. These items included: aggravated assault, assault with a deadly weapon, armed robbery, and gang fights. As this variable was intended to assess nonsexual violent delinquency, a question related to rape was dropped. Youths who responded with 2 (once a month) or higher

on any of the four SRD items measuring violent delinquency were coded as having engaged in violent delinquency.

Control Variables. The current study controlled for race.

Race. Youths were asked to choose the one race or ethnic group they felt closest to. This measure was recoded as a 0, 1 dichotomous measure with 0 representing White or Caucasian and 1 representing Persons of Color.

5.5 Analytic Strategy

All univariate, bivariate, and multivariate statistical analyses were performed using IBM SPSS Statistics, Version 22. Latent class analyses were performed using SAS 9.3 and models were fit using PROC LCA (Lanza, Dziak, Huang, Xu, & Collins, 2011).

I screened the data by exploring the associations between sexual crime characteristics and family problem variables, separately, using correlation matrices. Given that the rates of missing observations varied on these items, phi (Φ) correlations were used for correlation matrices, as the Chi-square value is sensitive to sample size and is therefore sometimes a misleading indicator of the extent of the relationship between two variables when sample sizes differ (David & Nagaraja, 2006). To correct this on 2 x 2 tables, the phi is used as a post-test measure to adjust the Chi-square statistic by the sample size (see Figure 6.1), as well as to provide an easily understood correlation that can vary from -1 to 1.

The correlation matrices offered an important screening tool to access how pairs of variables appeared in this sample. They also offered an analytical tool to screen data for inferential statistics. For the latent class analyses, two or more highly correlated ($\Phi = .7$ to 1 or -1.0 to -.7) items would offer redundant information and therefore present a challenge to model interpretation (Lanza et al., 2010). In the event of high correlation between two variables, it

would make sense to eliminate one unless leaving both had explanatory value. For the logistic

regression, highly correlated items would have complicated how either item was understood in

the model, as interpretation of a regression model depends on the assumption that predictors are

not strongly related (Chatterjee & Hadi, 2006).

$$\Phi = \sqrt{\frac{\chi^2}{n}}$$

Figure 5.2 Phi correlation

Question 1 analyses: Do latent classes of JSAs emerge based on sexual crime

characteristics? Research question 1 involved the classification of JSAs. Latent class analyses

(LCA) were performed using SAS 9.3 and models were fit using PROC LCA (Lanza et al.,

2011). LCA is similar to cluster analysis conceptually, but based upon a measurement model of

factor analysis. Despite innumerable possibilities of configurations, circumstances tend to

organize into a relatively small number of patterns, thereby placing emphasis on regularities and

configurations of interactive indicators which distinguish qualitatively different groups of

individuals (Bergman & El-Khouri, 2003; Keller et al., 2007). Latent class analyses model

heterogeneity by using latent categorical variables to represent subpopulations which differ

according to their patterns on a variety of indicators (McCutcheon, 1987), resulting in an

empirical classification of individuals who share a common profile (Keller et al., 2007). (See

Figure 6.2.)

There are three ways to assess fit in LCA: absolute fit, relative fit, and classification

accuracy (Masyn, 2013). There is no single consensus method for comparing models with

differing numbers of latent classes (Asparouhov & Muthen, 2008; Nylund, Asparouhov, &

Muthén, 2007). Additionally, experts in LCA recommend examining the classes and using one's

own knowledge of the variables to see what makes sense (Masyn, 2013). In the current study, class fit was assessed according to Masyn's (2013) recommended steps for determining the number of latent classes by using a systematic consideration of a set of plausible models, as well as a combination of statistical and substantive model checking (Lanza, Collins, Lemmon, & Schafer, 2007; Muthén, 2003).

Step 1) Fit a one-class model by recording the likelihood ratio chi-square goodness-of-fit statistic (G^2 with df), which tests the null hypothesis that the specified model fits the data (Agresti & Min, 2002). This statistic has an asymptotic chi-square distribution; thus, when the sample size is sufficient and the degrees of freedom are not too large, this value can be compared to the chi-square distribution with degrees of freedom given by the LCA model. Concurrently, record the model Akaike's information criterion (AIC; Akaike, 1987) Bayesian information criterion (BIC; Schwarz, 1978) and sample-size-adjusted Bayesian information criterion (ABIC).

Step 2) Fit a two-class model by repeating the same process, testing the two-class model against the null one-class model; the bootstrap likelihood ratio test (BLRT) p-value, testing the two-class model against the null one-class model, estimating the ratio of the probability of the one class model to the probability of the two-class being the correct model.

Step 3) Repeat the following for number of classes (K) ≥ 3, increasing K by 1 at each repetition until the K-class model is not well identified: fit a K-class model following Step 1, testing the K-class model against the null $(K − 1)$-class model; the BLRT p-value, testing the K-class model against the null $(K − 1)$-class model, estimating the ratio of the probability of the $(K − 1)$-class model being the correct model to the probability of the K-class being the correct model.

Step 4) Let K_{max} models be the largest number of classes that could be extracted in a single model from Step 3. Compute the approximate correct model probability (cmP) across the one-class through K_{max} models fit in Steps 1 through 3.

Step 5) From the K_{max} models in Steps 1 through 3, select a smaller subset of two to three candidate models based on absolute and relative fit indices.

To assess for absolute fit, I identified the most parsimonious model (i.e. the one with the fewest number of classes) that was not rejected by the likelihood ratio chi-square goodness-of-fit statistic. I also examined the AIC, BIC and ABIC statistics, looking for the smallest value.

To assess for relative fit, how one solution compares with a nearby solution, I looked at the BLRT. The optimal model is that with smallest number of classes that is not significantly improved by adding another class. Or, the most parsimonious model not rejected in favor of K-class model + 1. However, it is possible that the BLRT will not yield non-significant p-values.

In cases where absolute fit and relative fit cannot be determined, approximating the best model is acceptable, with any model $cm\hat{P}_{K>.10}$ presenting an acceptable potential candidate.

To assess for classification accuracy, I examined the standardized residual values for the subset of candidate models selected in Step 5 and determined whether or not the latent classes of one model helps interpret JSAs better than another. After weighing the utility of the models on the basis of clarity and simplicity (Bergman & Trost, 2006), I decided upon a final LCA model to describe the JSAs in my sample and to use in further analyses.

Next, I visually graphed the different classes, using the predictive variables on the *x*-axis and percentage of respondents scoring positively for each attribute on the *y*-axis. This helped in observing how specific variables help differentiate among class solutions. The best solutions have variables that differentiate among classes.

```
┌──────────────────┐
│   Child victim   │────────────┐
└──────────────────┘             \
┌──────────────────┐              \
│ Teen/adult victim│───────────┐   \
└──────────────────┘            \   \
┌──────────────────┐             \   \   ┌─────────────────┐
│   Male victim    │──────────┐   \   \  │                 │
└──────────────────┘           \   \   ➘ │     Latent      │
┌──────────────────┐            ➘   ➘    │                 │
│ Offense debut < 12│──────────➘         │      class      │
└──────────────────┘                     │                 │
┌──────────────────┐            ➚         └─────────────────┘
│   Penetration    │──────────➚   ➚    ➚
└──────────────────┘           /   /   /
┌──────────────────┐          /   /   /
│      Force       │─────────┘   /   /
└──────────────────┘            /   /
┌──────────────────┐           /   /
│ Planned offenses │──────────┘
└──────────────────┘
```
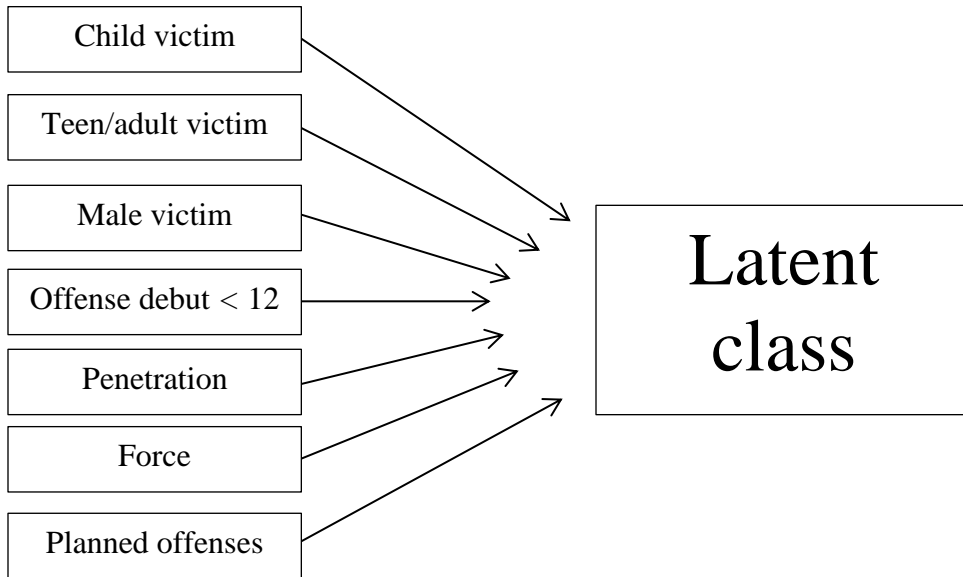
Figure 5.3 Hypothesized latent class model with sexual crime characteristics

Missing data in LCA. As noted earlier in this chapter, the rate of missing observations on sexual crime characteristics was higher than other variables in the study, ranging from 2.4% to 25.3%. Missing data in PROC LCA are handled with a full-information maximum likelihood (FIML) technique. The use of FIML estimation allows a statistical model's parameters to be estimated in the presence of missing data, with all information used to inform the parameters' values and standard errors (Little, 2013). Use of FIML assumes data are missing at random (MAR).

The pattern of missing items was explored to identify if the data were missing completely at random (MCAR), missing at random (MAR), or not missing at random (NMAR). Little's test produced significant results, indicating that these data were not missing completely at random (Little, 1988). Unfortunately, there is no standard test to determine if data are MAR. Using the analysis of missing values function in IBM SPSS Statistics, Version 22, Missing Data module, I did not observe a clear pattern among missing items and there were a total of 20 missing data

patterns with estimated means that did not appear to have a notably different distribution of values. Given this, I was able to assume items were missing at random (MAR) and use multiple imputation to fill in missing data.

Question 2 analyses: What is the relationship between classes of JSAs derived from their sexual crime characteristics with their family contexts, mental health, and concurrent delinquency? For research question 2, I analyzed data in two stages. First, I conducted Chi-square analyses to determine if there were differences between the classes on each of the family related variables, the mental health variables, and delinquency variables. Where differences were found, it was not possible to determine how the groups differed from one another using Chi-squares. Therefore, I subsequently ran a series of logistic regressions to explore these differences further.

Missing data on question 2. All Chi-square analyses presented in the current study are with the best class assignment from question 1 and original data using pairwise deletion. However, in subsequent logistic regressions, I used pooled estimates of imputed data (explained below). Therefore, to boost confidence in the Chi-square findings, I did a post-hoc comparison in Microsoft Excel of all original data and the pooled estimates that were later used in logistic regressions. For each variable, I entered the pooled estimates of each class as my observed data and the corresponding information from the original sample as my expected data in a Chi-square test. None of the Chi-squares were significant. Therefore, I was not able to reject the null hypothesis that there were no differences between the original data and the pooled data used in later logistic regressions.

To prepare data for logistic regressions, I examined the rates of missing observations among the independent family, mental health, and delinquency variables. Following the analyses

for question 1, six participants were dropped from further analyses, leaving an $N = 566$. As seen in Appendices C.1 and C.2, slightly less than half of those remaining ($n = 257$, 45.33%) had complete data on all 17 independent variables of interest in Question 2. Therefore, a logistic regression with listwise deletion would have resulted in a drop of more than half the remaining sample ($n = 310$, 54.67%). However, among the 310 respondents missing at least one missing item, the vast majority ($n = 232$, 74.84%) was missing three or fewer of the 17 items. Rates of missing responses on specific items ranged from a high of 16% ($n = 93$), on anxiety, to a low of 3% on both age and grade ($n = 18$).

As with the items for question 1, the pattern of missing items was explored to identify if the data were missing completely at random (MCAR), missing at random (MAR), or not missing at random (NMAR). Little's test produced significant results, indicating that these data were not missing completely at random (Little, 1988). Using the analysis of missing values function in IBM SPSS Statistics, Version 22, Missing Data module, I did not observe there to be a clear pattern among missing items and there were a total of 130 missing data patterns with estimated means that did not appear to have a notably different distribution of values. Given this, I was able to assume items were missing at random (MAR) and use multiple imputation to fill in missing data.

Using SPSS, Version 22.0, I imputed data using a Markov chain Monte Carlo (MCMC) algorithm known as fully conditional specification (FCS). This method is considered by many to be the most appropriate for variables to be used logistic models (Lee & Carlin, 2010; Van Buuren, 2007; White, Royston, & Wood, 2011), rather than the more commonly used MCMC parametric approach to multiple imputation, multivariate normal distribution (MVN). Whereas MVN assumes all variables have a joint multivariate distribution and uses a data augmentation

algorithm, FCS does not assume joint distribution. Instead, incomplete variables are imputed one at a time, using the filled-in variable from one step as a predictor in all subsequent steps. SPSS uses linear regression to impute continuous variables and logistic regression for categorical variables.

Pooled outcome variables in all multivariate logistic regressions were derived from an imputation that included all 17 independent variables and the dependent variable, as recommended by Enders (2010). To choose the number of iterations, I started with Rubin's (1987) formula for efficiency of estimated parameters: desired efficiency (e.g. .95) = $1/(1 + \gamma/M)$, where γ is the fraction of missing information (solve for M). In this analysis, there were 567 subjects multiplied by 18 variables, for a total of 10,206 possible observations. Of these, 820 observations were missing information, or approximately 8%. According to Rubin's formula, I would need to run ten imputations for 99% efficiency. Some scholars have criticized Rubin's calculations by suggesting that the number of recommended iterations is too low (e.g. Allison, 2012). With this in mind, I ran 20 imputations with 200 iterations separating each imputed data set, thereby increasing the chances that my point estimates were reliable and standard errors were efficient.

Question 3 analyses: Can JSAs be classified more broadly according to sexual crime characteristics, family contexts, mental health, and concurrent delinquency? The analysis for question 3 followed the exact steps outlined in question 1 and repeated these multiple times. Items from the final logistic analysis were added to sexual crime characteristics in the initial model with a single class. After graphing two, three, four, and five class models, I removed variables that appeared to provide redundant information and repeated the process of estimating and graphing classes. Findings from this question were largely intended to be descriptive, as I

wanted to determine whether or not the addition of variables would change the configuration of

classes and offer an opportunity for meaningful interpretation to provide a direction for future

work.

CHAPTER 6

RESULTS

The results are organized into four sections presented in order of the study questions. First, results are presented for the univariate and bivariate analyses of all sexual offending characteristics, family variables, mental health symptoms, and concurrent delinquency. In the second section, the latent class analysis of youths based on their sexual offense characteristics is explained. In the third section, differences in family, mental health symptomology, and delinquency among the classes of JSAs are presented. In the final section, the construction of a latent class model with sexual offending characteristics, family variables, and mental health symptoms is presented.

6.1 Descriptive Statistics

Sexual crime characteristics. JSAs were asked to indicate the ages of their victims, the age of their sexual offending debut, and whether or not they used force in the commission of a sexual offense. Items concerning the penetration of victims were used to determine whether or not the youths had committed an act of oral, anal, or genital penetration. These items were condensed into a single, yes or no, penetration variable (see Table 6.1).

Table 6.1

Frequency: Sexual Crime Characteristics ($N = 573$)

	Number (percentage)
Victim age	
Child victims	355 (62.0)
No child victims	79 (13.8)
Teen and/or adult victims	177 (30.9)
No teen and/or adult victims	257 (44.9)
Both child and teen and/or adult victims	98 (17.1)
Missing victim age	139 (24.3)
Male	
Male victims	221 (38.6)
No male victims	284 (49.6)
Missing	68 (11.9)
Sexual offense debut	
Sexual offense debut < 12 years old	133 (23.2)
Sexual offense debut ≥ 12 years old	337 (58.8)
Missing	103 (18.0)
Penetration	
Sexual offense with penetration	257 (44.9)
Sexual offense without penetration	212 (37.0)
Missing	104 (18.2)
Force	
Ever used force in sexual offenses	114 (19.9)
Never used force in sexual offenses	314 (54.8)
Missing	145 (25.3)
Plan	
Planned sexual offenses	318 (55.5)
Did not plan sexual offenses	241 (42.1)
Missing	14 (2.4)

As seen in Table 6.2, multicollinearity was not a problem between items related to the

JSAs' sexual offense characteristics, although a number of associations were evident. There was

a moderate negative association between having a child victim and having a teen or adult victim

($\Phi = -.568$, $p < .001$), while all other significant associations were weak. It is noteworthy that

having a child victim was negatively associated with the use of force ($\Phi = -.147$, $p < .01$) and

positively associated with having a male victim ($\Phi = .228$, $p < .001$). Although the child victim

variable and the teen or adult victim variable were not mutually exclusive, inverse associations were observed among those reporting a teen or adult victim; the use of force had a positive association with having an older victim (Φ = .139, $p < .01$), while having a teen or adult victim was negatively associated with having a male victim (Φ = -.133, $p < .01$).

Table 6.2
Phi Coefficients of Sexual Crime Characteristics (*N*=573)

	Child victims	Teen/Adult victims	Male victims	Offense debut < 12 y/o	Use of penetration	Use of force	Plan offenses
Child victims	1.000 (*n* = 434)						
Teen/Adult victims	-.568*** (*n* = 434)	1.000 (*n* = 434)					
Male victims	.228*** (*n* = 415)	**-.133**** **(*n* = 415)**	1.000 (*n* = 505)				
Offense debut < 12 y/o	.264*** (*n* = 434)	**.064** **(*n* = 434)**	.076 (*n* = 443)	1.000 (*n* = 470)			
Use of penetration	.093 (*n* = 418)	.018 (*n* = 418)	.097* (*n* = 439)	**-.120**** **(*n* = 452)**	1.000 (*n* = 469)		
Use of force	-.147** (*n* = 389)	.139** (*n* = 389)	-.009 (*n* = 401)	-.011 (*n* = 419)	.148** (*n* = 418)	1.000 (*n* = 428)	
Plan offenses	**.156** **(*n* = 430)**	-.014 (*n* = 430)	.211*** (*n* = 500)	**.107*** **(*n* = 466)**	.149*** (*n* = 464)	.074 (*n* = 426)	1.000 (*n* = 559)

$* p < .05, ** p < .01, *** p < .001$

Note: Correlations were calculated using pairwise deletion of missing data. Correlations were run a second time using listwise deletion (*n* = 363). With the exception of the items in bold, non-significant changes in the probability coefficients were observed. Items in bold are those that were significant or marginally significant using pairwise deletion, but the significance swapped in listwise deletion.

Family context. In Table 6.3, the composition of custodial guardianship reported by the JSAs is shown. A small majority of the sample reported coming from two parent homes ($n = 294$, 55.3%), including those who were raised with a parent and the parent's partner prior to their incarceration. It is noteworthy that single mothers comprised the next largest class of custodial parents ($n = 132$, 23.0%), yet nearly twice as many youths reported having been raised in foster care ($n = 30$, 5.2%) than by single fathers ($n = 16$, 2.8%). In later analyses, categories were condensed as follows: two parents ($n = 294$, 55.3%), one parent and partner ($n = 118$, 20.6%), single parent ($n = 148$, 25.8%), non-parent relative ($n = 59$, 10.3%), and foster home ($n = 30$, 5.2%).

Table 6.3

*Frequency: "Which one of the following BEST describes the family
you were raised in?"* ($N = 573$)

	Number	Percentage*
Two parent	176	30.7
Single mother	132	23.0
Mother and partner	94	16.4
Other relative	32	5.6
Foster home	30	5.2
Grandparent	27	4.7
Father and partner	24	4.2
Single father	16	2.8
Missing	42	7.3

*Note. Sorted by percentage

Family problems. From Table 6.4, it is clear that remarkable challenges were present in the lives of a large proportion of the participants and their families. On average, youths reported the presence of between two and three ($SD = 2.14$) of the nine problems identified by the items. The vast majority of the sample reported at least one problem ($n = 468$, 82.0%), while more than a third of the youths reported four or more ($n = 187$, 32.8%). Given the high degree of turmoil in

these families and/or homes, it is unsurprising that more than a third of the youths ($n = 196$, 34.2%) reported having been placed in foster care at least once.

Table 6.4

Frequency: "Do these describe your family and/or home?" ($N= 573$)

	Yes* *n (%)*	No *n (%)*	Missing *n (%)*
Illegal acts by family members (other than you)	244 (42.6)	255 (44.5)	74 (12.9)
Hitting, slapping, punching, or other violence between parents or adults at home	232 (40.5)	305 (53.2)	36 (6.3)
Parent with alcohol or drug problem	224 (39.2)	305 (53.2)	44 (7.7)
Lots of moves and/or homelessness	198 (34.6)	332 (57.9)	43 (7.5)
Placed in foster care (non-relatives)	150 (26.2)	372 (64.9)	51 (8.9)
Placed in class home	137 (23.9)	397 (69.3)	45 (7.9)
Very poor (little money, food, clothes, heat, etc.)	120 (20.9)	408 (71.2)	45 (7.9)
Siblings placed in foster care (not you)	119 (20.8)	416 (72.6)	38 (6.6)
Placed in foster care with relatives	99 (17.3)	432 (75.4)	42 (7.3)

*Note. Sorted by "Yes" percentage

In Table 6.5, correlations among family problems are displayed. Unsurprisingly, the largest effect sizes were observed among the three most frequently reported problems: reporting illegal acts by family members was moderately correlated with the presence of family violence ($\Phi = .408$, $p < 0.001$), as well as having a parent with a substance abuse problem ($\Phi = .405$, $p < .001$). Also, family violence was moderately correlated with having a parent with a substance abuse problem ($\Phi = .409$, $p < .001$).

Table 6.5
Phi Coefficients of Family Problems †(N = 573)

	Illegal acts by family	Family violence	Parent sub. abuse	Lots of moves/ homeless	Ever in FC with strangers	Ever in group home	Very poor	Sibs in FC	Ever in FC with relatives
Illegal acts by family	1.000 (n = 499)								
Family violence	.408*** (n = 487)	1.000 (n = 537)							
Parent sub. abuse	.405*** (n = 476)	.409*** (n = 508)	1.000 (n = 529)						
Lots of moves/homeless	.274*** (n = 475)	.262*** (n = 506)	.195*** (n = 500)	1.000 (n = 530)					
Ever in FC with strangers	.130** (n = 457)	.165** (n = 489)	**.095*** (n = 487)	.173*** (n = 484)	1.000 (n = 522)				
Ever in group home	.132** (n = 463)	.128** (n = 494)	.173*** (n = 493)	.149*** (n = 489)	.350*** (n = 515)	1.000 (n = 528)			
Very poor	.238*** (n = 476)	.272*** (n = 508)	.234*** (n = 499)	.313*** (n = 507)	.0922* (n = 483)	.024 (n = 488)	1.000 (n = 528)		
Sibs in FC	.263*** (n = 484)	.334*** (n = 516)	.229*** (n = 502)	.357*** (n = 505)	.346*** (n = 489)	.201*** (n = 493)	.288*** (n = 506)	1.000 (n = 535)	
Ever in FC with relatives	.129** (n = 466)	**.089*** (n = 497)	**.097*** (n = 495)	.127** (n = 492)	.273*** (n = 518)	.097* (n = 521)	**.088*** (n = 491)	.270*** (n = 497)	1.000 (n = 531)

* $p < .05$, ** $p < .01$, *** $p < .001$
† Note: Correlations shown on original data using pairwise deletion. Correlations were run a second time using listwise deletion ($N = 378$). Items in bold are those that were significant or marginally significant using pairwise deletion, but the significance swapped in listwise deletion. Correlations were computed a third time using data pooled from the original, along with 20 imputed sets. There was little or no change in the coefficients. Furthermore, all items that were significant using pairwise deletion remained significant with the pooled estimates.

Attachment to mother. Using the cut scores described in chapter 5, strong attachment was indicated for those whose scores were equal to or greater than one standard deviation above the mean ($n= 74$, 12.9%). Conversely, youths with scores equal to or lower than one standard deviation below the mean were identified as having low attachment ($n= 84$, 14.7%). Those remaining ($n= 367$, 64.0%) were considered to have typical attachment relative to others in the sample.

Mental health. Depression and anxiety were measured using scales from the Millon Adolescent Clinical Inventory (MACI; Millon, 1993). According to the authors of the measure, scores in either the present or prominent range or the most prominent range meet the threshold of clinical concern. In subsequent analyses, depression and anxiety were treated as dichotomous variables: JSAs were recorded as having the condition present or not. As shown in Table 6.6, there was a notable amount of depression among JSAs in this sample, with more than a third meeting the threshold ($n= 213$, 37.2%). There was less anxiety than depression shown among the respondents, as slightly more than 10% of the sample endorsed anxiety ($n= 74$, 12.9%). Comorbidity was high among those with symptoms of anxiety, as 48 of the respondents (64.9%) also endorsed depression.

Table 6.6

Frequency: Mental Health ($N= 573$)

	Number	Percentage
Depression		
Present	213	37.2
Not present	262	45.7
Missing	98	17.1
Anxiety		
Present	74	12.9
Not present	400	69.8
Missing	99	17.3

Delinquency (nonsexual criminality). Delinquent behaviors not related to sexual

offending were measured using items from the Self-Reported Delinquency (SRD; Elliott,

Huizinga, & Ageton, 1985). The majority reported to have committed at least some acts of

nonsexual delinquency (see Table 6.7), with fewer than ten percent having denied any delinquent

behaviors beyond their sexual offenses ($n = 50$, 8.7%). The groups were not mutually exclusive,

as nearly all of those who reported violent acts of delinquency concurrently reported to have

committed nonviolent delinquent acts ($n = 235$, 99.6%). Despite this overlap, a difference was

observed between those who reported nonviolent acts of delinquency and those who reported

violent acts of delinquency ($\Phi = .31$, $p \leq .001$).

Table 6.7

Frequency: Concurrent Delinquency (*N*= 573)

	Number	Percentage
Sexual abuse only	50	8.7
Sexual abuse plus non-violent delinquency only	205	35.8
Sexual abuse plus non-violent & violent delinquency	235	41.0
Missing	83	14.5

6.2 Question 1 Results

Do latent classes of JSAs emerge based on sexual crime characteristics? In this section, I

explain the classification of youths according to their sexual crime characteristics. Latent class

analysis was performed using the PROC LCA macro (Lanza et al., 2011) in SAS, Version 9.3 to

estimate models for one through five classes to determine the optimal number of classes of

youths in this sample. Seven binary indicators were included in the estimation of classes: child

victims; teen or adult victims; male victims; age of sexual assault debut (< 12 years or ≥ 12

years); use of penetration; use of force; planned sexual offenses. Of the 573 JSAs in the sample,

six were missing data on all sexual crime characteristic indicators and therefore dropped from further analyses.

LCA fit indices for one- through five-class solutions are summarized in Table 6.8. According to results from the Bayesian Information Criterion (Schwarz, 1978), a three-class solution appears to be the best fit. Values from the Akaike Information Criterion (Akaike, 1987) drop precipitously until the four-class solution, only dropping slightly further (< 1.0) in the five-class solution, suggesting that the four- or five- class solution is equally appropriate. The drop in G^2 relative to the drop in degrees of freedom is substantial with each additional class up to the four-class model before dropping below the degrees of freedom, ($df = 96$, $G^2 = 82.59$), suggesting that the addition of classes beyond four may not provide an improvement in fit based on the G^2 statistic.

To test relative fit, I ran a series of parametric bootstrap likelihood ratio tests (BLRT), or a test of the hypothesis that a given class LCA model is adequate to describe the population versus the alternative hypothesis that a (k + 1)-class is required. Nylund and colleagues (2007) found the BLRT to be a consistent indicator of classes across models. According to the BLRT, a five-class solution is not required to describe the population when compared to a four-class solution ($p = 0.12$). Careful examination of both the four- and five-class model solutions led me to select the four-class model because it was more easily identified, had greater parsimony, and its parameter estimates presented a solution with a logical substantive interpretation.

Table 6.8

Goodness-of-Fit Test Statistics for Sexual Crime Characteristics LCA Models with 1 – 5 Classes

No. Classes	1	2	3	4	5
G^2	420.77	165.37	105.86	82.59[b]	65.81[b]
Df	120	112	104	96	88
AIC	434.77	195.37	151.86	144.59[a]	143.81
BIC	465.14	260.45	251.65[a]	279.09	313.01
ABIC	442.92	212.83	178.64[a]	180.68	189.21
BLRT	n/a	0.01	0.01	0.02[a]	0.12

Note. G^2 = likelihood ratio statistic; *df* = degrees of freedom; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; ABIC = Adjusted Bayesian Information Criterion; BLRT = Bootstrap likelihood ratio tests
[a]Best-fitting model according to that index. [b]Minimum threshold met for fit.

Figure 6.1 and Table 6.9 summarize the prevalence and characteristics of the four latent classes. Scores of 0 and 1 are perfect associations; a parameter of 0.5 can be interpreted as unknown, or 'Given class membership, we do not know how a person in this class would respond to this item.' In Figure 6.1, a line graph is used to show differences in any given individual's probability to endorse items depending upon class assigned, while Table 6.9 displays the parameters of the probabilities in a side-by-side comparison. JSAs were considered to have a high likelihood of item endorsement at or above the 0.7 threshold, and a low likelihood of endorsement at or below the 0.3 threshold. (See Appendix B for exact probabilities.) Table 6.9 is provided to illustrate a clear comparison of high, low, and neutral likelihoods for item endorsement.

Justification for the name selection and interpretation of the classes will be explained in the discussion. The largest class (48.61%) was labeled Curious/Bad Boundaries. As seen in Table 6.9, JSAs in this class endorsed a high likelihood of having a child victim, and a low likelihood of having a teen or adult victim, a sexual offense debut under the age of 12, or of using force in their sexual offenses. I named the second largest class Impulsive/Antisocial

(20.5%). JSAs in this class were more likely to have a teen or adult victim and unlikely to have a child victim, male victim, or to have started their sexual offending prior to age 12.

The third largest class was named Sexually Focused/Covert (16.5%). Like the first two classes, members of this class were likely to have started their offending after turning 12, but they were the only class also likely to concurrently have child victims, male victims, and to have planned their offenses. I called the smallest class Early Starter/Opportunist (14.8%), as they were the only class likely to have begun their sexual crimes prior to turning 12 and a minimum of two victims, one child and one teen or adult. Similarly to the Sexually Focused/Covert class, these JSAs were also likely to have planned their offenses and committed acts of penetration.

For classification accuracy, I used the average posterior class probability (AvePP) to evaluate the specific classification uncertainty for each of the classes. Nagin (2005) suggests a minimum (AvePP) of .70 to consider the classes well separated and class assignment accurate. Using the four class solution, each of the classes met the minimum accepted mean, ranging from .76 ($SD = .14$) to .96 ($SD = .38$). The assignment of best class for individuals in the sample based on post posterior means probability resulted in a change in the overall percentage of class membership estimated in the original model. Three hundred and twenty three JSAs were identified in the Curious/Bad Boundaries class, resulting in an increase in the percentage of the sample to 57.0% from the 48.6% estimated in the original model. All other class percentages dropped: the Impulsive/Antisocial class had 88 individuals assigned, which is 15.5% of those remaining in the sample, originally estimated to be 20.5%. The Sexually Focused/Covert class ($n = 83$, 14.6%) was originally estimated at 16.5%. The Early Starter/Opportunist class ($n = 73$, 12.9%) was originally estimated to be 14.8%. All post-LCA analyses reflect these best class assignments.
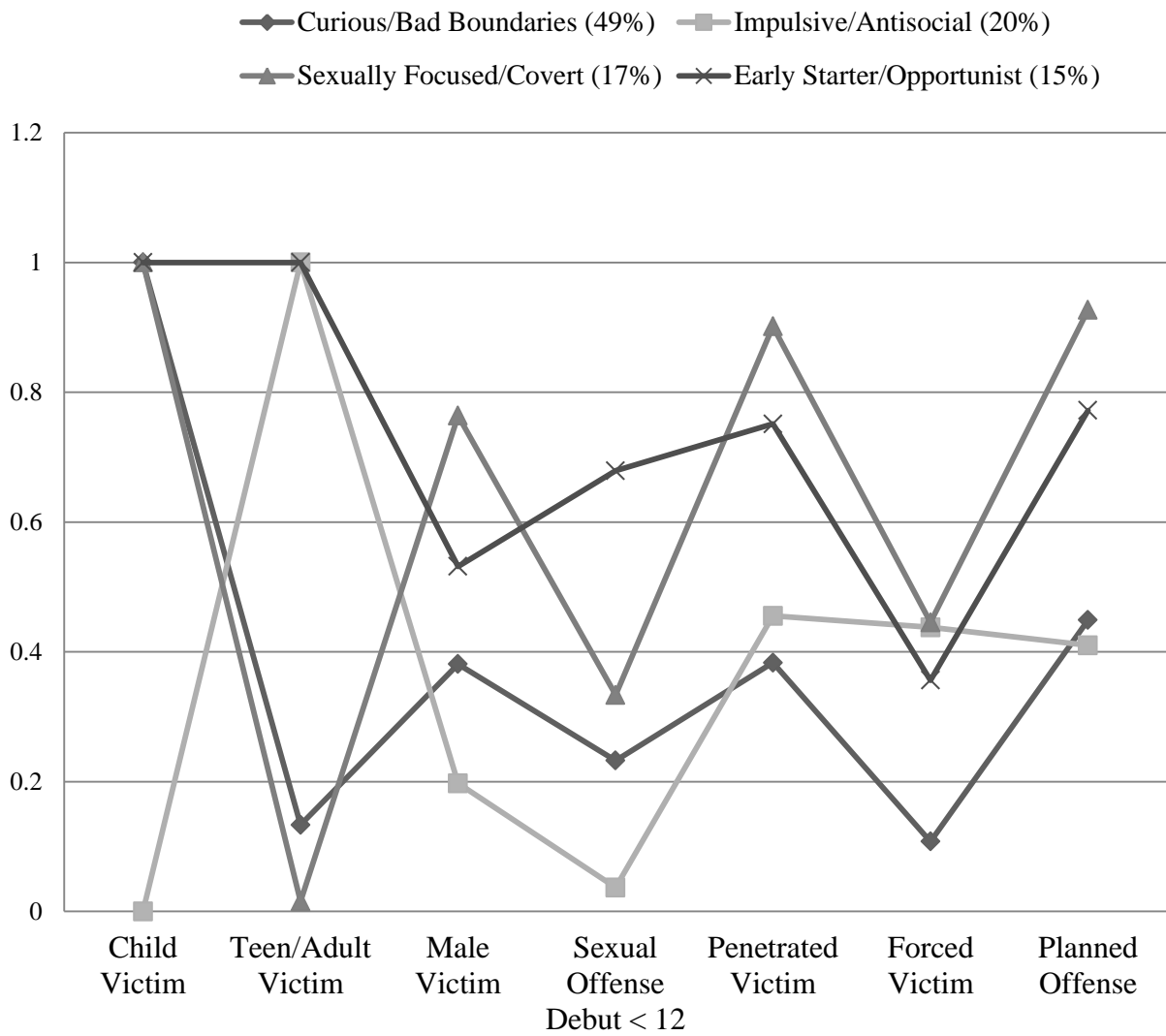
Figure 6.1 Probability of item endorsement by class

Table 6.9

Likelihood of Sexual Crime Characteristic by Class

	Child Victim	Teen/ Adult Victim	Male Victim	Sexual Offense Debut < 12	Penetrated Victim	Forced Victim	Planned offense
Curious/Bad Boundaries (48.61%)	X	O	—	O	—	O	—
Impulsive/ Antisocial (20.05%)	O	X	O	O	—	—	—
Sexually Focused/ Covert (16.50)	X	O	X	O	X	—	X
Early Starter/Opportunist (14.84%)	X	X	—	X	X	—	X

X ≥ 0.7 likelihood of item endorsement
O < 0.3 likelihood of endorsement
— = likelihood of endorsement between .31 and .69

Question 1 Post Hoc Results

Age. Although the mean age of the sample was 16.7 ($SD = 1.7$), the range in age was from 11 to 20. It seemed possible that at least three of the sexual crime characteristics used in estimating the classes were tied to age: age of sexual offense debut, the likelihood of a child victim, and the likelihood of a teen or adult victim.
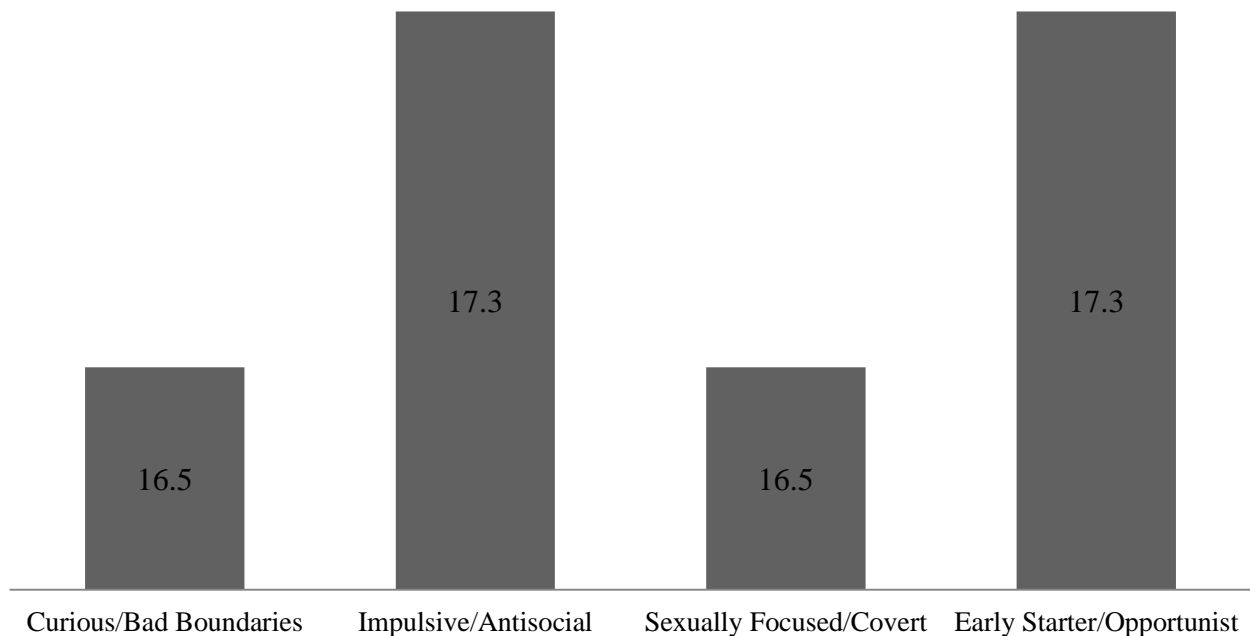
Figure 6.2 Mean age of classes in years

Figure 6.2 provides a clear picture of the age differences found. The mean ages of the

Curious/Bad Boundaries class ($M = 16.53$, $SD = 1.72$) and the Sexually Focused/Covert class ($M = 16.51$, $SD = 1.72$) were nearly identical, and both were significantly different from the

Impulsive/Antisocial class ($M = 17.30$, $SD = 1.48$) and the Early Starter/Opportunist class ($M = 17.25$, $SD = 1.69$), which were also nearly identical.

As suspected, there seemed to be a relationship between the mean age of the class and the ages of their victim(s): The two older classes were highly likely to have a teen or adult victim, while the two younger classes, although also well into their teens, were unlikely to have a teen or adult victim. Also, both of the younger classes were highly likely to have had a child victim, while only one of the older classes, the Early Starter/Opportunist was likely to have had a child victim as well as a teen and/or adult victim (see Table 6.9 and Fig. 6.2).

Grade level. Consistent with the mean differences observed in age, a Tukey-Kramer post-hoc comparison of grade levels revealed that the Impulsive/Antisocial classhad a mean grade completion that was significantly higher than both the Curious/Bad Boundaries class (M = 0.70 grades higher) and the Sexually Focused/Covert class (M = 0.91 grades higher). However, no differences were found between the Early Starter/Opportunist class and the two younger classes.

Question 1 Results Summary

It was hypothesized that three or more classes would be well identified on the basis of sexual crime characteristics. This hypothesis was supported, as four distinct classes were discovered. While there were many similarities between the classes, the likelihood of endorsing (or not endorsing) any single sexual crime characteristic was not the same across all four classes.

6.3 Question 2 Results

Chi-square analyses. What is the relationship between classes of JSAs derived from their sexual crime characteristics with their family contexts, mental health, and concurrent delinquency? According to best class assignment, no class differences were found on race χ^2(6, N = 530) = 3.22, p = .781, family context (e.g. two parents, single parent) χ^2(12, N = 526) = 10.03, p = .613, or any of the following family problem variables: parent with alcohol or drug problem χ^2(3, N = 525) = 5.80, p = .122; very poor (little money, food, clothes, heat, etc.) χ^2(3, N = 523) = 5.82, p = .121; placed in foster care (non-relatives) χ^2(3, N = 520) = 4.92, p = .178; placed in foster care with relatives χ^2(3, N = 529) = 2.89, p = .410.

Family problems. In Table 6.10, family problem variables in which I found significant class differences are shown. Class differences were observed on the following family problem variables: illegal acts by family members χ^2(3, N = 493) = 16.98, p < .001; violence between parents or adults at home χ^2(3, N = 531) = 22.79, p < .001; lots of moves and/or homelessness

$\chi^2(3, N = 525) = 12.48, p = .006$; placed in group home $\chi^2(3, N = 525) = 7.89, p = .048$; siblings placed in foster care $\chi^2(3, N = 530) = 12.21, p = .007$.

Mental health and delinquency. Marginally significant differences were found on symptoms of anxiety $\chi^2(3, N = 474) = 7.16, p = .067$ and depression $\chi^2(3, N = 475) = 7.18, p = .066$, as well as subtype of JSA according to concurrent delinquency (sex only, sex plus nonviolent delinquency, or sex plus violent delinquency) $\chi^2(6, N = 490) = 10.76, p = .096$. To test the delinquency variable further, I dummied it [sex only ($n = 50$), sex plus violent delinquency ($n = 235$)] and separately tested each of the new variables against class membership. Class differences were not found among JSAs who committed sexual crimes only $\chi^2(3, N = 490) = 5.46, p = .141$, but were found among those who also committed violent acts of delinquency $\chi^2(3, N = 490) = 7.83, p < .05$. (See Table 6.11 for endorsement of depression, anxiety, and delinquency by class.)

Attachment. Finally, class differences were observed on attachment $\chi^2(6, N = 525) = 21.69, p < .001$. In the interest of creating a more parsimonious logistic model, I dummied this three category variable into two variables (low attachment = 1, else = 0; high attachment = 1, else = 0) and separately tested those who indicated low attachment ($n = 84$) and those who indicated high attachment ($n = 74$). Class differences were found among those who scored low in attachment $\chi^2(3, N = 525) = 19.50, p < .001$, but not among those who scored high in attachment $\chi^2(3, N = 525) = 2.88, p = .411$. (See Table 6.11 for endorsement of low attachment by class.)

Among the variables in which class differences were found, I observed that two of the classes, Sexually Focused/Covert ($n = 83$) and Early Starter/Opportunist ($n = 73$), showed similar levels of family problems which were notably higher, in most cases, than those observed

in either the Curious/Bad Boundaries class ($n = 323$) or the Impulsive/Antisocial class ($n = 88$). Also, the Impulsive/Antisocial class showed a notably higher percentage of violent delinquency than any of the other three classes (see Tables 6.10 and 6.11.) These relationships were explored in more detail with multinomial logistic regression.

Table 6.10

Percentage of Family Characteristics within Each Class

	Illegal acts by family members (other than you)***	Hitting, slapping, punching, or other violence***	Lots of moves and/or homelessness**	Placed in group home*	Siblings placed in foster care (not you)**
Curious/Bad Boundaries (*n* = 323)	41.6%	35.1%	32.4%	21.9%	17.7%
Antisocial/ Impulsive (*n* = 88)	53.8%	45.3%	36.6%	35.8%	22.6%
Sexually Focused/Covert (*n* = 83)	63.2%	58.4%	52.1%	31.6%	27.8%
Early Starter/Opportunist (*n* = 73)	62.5%	59.4%	47.0%	26.8%	35.8%

Between class differences were found in Chi-square analyses.
* *p* < 0.05, ** *p* < 0.01, *** *p* < 0.001

Table 6.11

Percentages of Mental Health, Attachment, and Violent Delinquency within Each Class

	Depression	Anxiety	Low attachment to mother***	Violent delinquency*
Curious/Bad Boundaries (*n* = 323)	41.1%	14.4%	11.1%	44.2%
Antisocial/ Impulsive (*n* = 88)	40.8%	11.3%	16.3%	60.5%
Sexually Focused/Covert (*n* = 83)	57.1%	14.3%	19.5%	53.5%
Early Starter/Opportunist (*n* = 73)	50.7%	26.1%	31.9%	43.5%

Between class differences were found in Chi-square analyses.
* *p* < 0.05, ** *p* < 0.01, *** *p* < 0.001

Logistic regression analyses. To gain more specificity in the relationship of class membership to the variables of interest, items were regressed onto the variable for class assignment using multinomial logistic regression. When running multinomial logits using imputed data, SPSS Version 22.0 provides model fit statistics (likelihood ratio tests and pseudo R-squared) on the original data and on each imputed data set (in the current study, 20 sets), but does not provide this information on pooled data. For this reason, model fits for the logistic regressions are not reported in this study, only the parameter estimates of pooled data.

In the first regression, all 17 independent variables were regressed onto class, with the largest class, Curious/Bad Boundaries ($n = 323$, 57.0%) as the reference class. All standard errors for b coefficients were less than 2.0, suggesting there was no multicollinearity among the independent variables. Relative to the reference class, no significant relationships were found among variables that were not previously significant in Chi-square analyses.

I ran subsequent models in which I dropped variables, one or two at a time, in order of least significance. Of course, significance levels were not always similar for all three classes; initially, I only dropped variables that were not significant in any class when compared to the reference class. For example, I began by dropping family context variables, as class differences were neither found in Chi-squares nor the full model. In the final, most parsimonious model, many, although not all, of the variables that showed a significant relationship to class membership in Chi-square analyses were also present. I ran the final model with and without race dummies and grade level as controls. Grade level, although significant in the Chi-square analysis, was never more than marginally significant in any of the regression models tested. Race was not significant in any class and neither added nor subtracted from standard errors on the

other variables of interest, so I left race out of the final model in the interest of interpreting the

most parsimonious model (see Table 6.12), leaving age the as the only control.

Table 6.12

Multinomial Logistic Regression: Associations Between Family, Mental Health, and Delinquency with Best Latent Class

Impulsive/Antisocial (Curious/Bad Boundaries, ref.)	**B**	**Std. Error**	**Wald†**	**Sig.**	**Exp(B)**	**95% CI Lower**	**95% CI Upper**
Intercept	-5.724	1.322	18.746	.000			
Violence among adults at home	.215	.271	.633	.426	1.240	.730	2.108
Lots of moves and/or homelessness	.033	.276	.014	.905	1.034	.601	1.777
Anxiety	-.068	.431	.025	.874	.934	.401	2.177
Low attachment to mother	.181	.381	.227	.634	1.199	.568	2.530
Violent delinquency*	.591	.289	4.176	.042	1.806	1.023	3.187
Age***	.271	.077	12.360	.000	1.312	1.128	1.526
Sexually Focused/Covert (Curious/Bad Boundaries, ref.)	**B**	**Std. Error**	**Wald†**	**Sig.**	**Exp(B)**		
Intercept	-1.704	1.258	1.834	.176			
Violence among adults at home**	.761	.278	7.479	.006	2.141	1.240	3.696
Lots of moves and/or homelessness**	.688	.274	6.285	.012	1.990	1.162	3.408
Anxiety	.207	.405	.260	.610	1.230	.555	2.723
Low attachment to mother	.212	.357	.352	.553	1.236	.614	2.490
Violent delinquency	.298	.279	1.148	.284	1.348	.780	2.328
Age	-.032	.076	.174	.677	.969	.835	1.124
Early Starter/Opportunist (Curious/Bad Boundaries, ref.)	**B**	**Std. Error**	**Wald†**	**Sig.**	**Exp(B)**		
Intercept	-5.510	1.391	15.684	.000			
Violence among adults at home**	.785	.298	6.910	.009	2.191	1.221	3.934
Lots of moves and/or homelessness	.317	.293	1.167	.280	1.373	.772	2.440
Anxiety*	.839	.353	5.649	.018	2.314	1.158	4.622
Low attachment to mother**	.998	.335	8.899	.003	2.713	1.408	5.227
Violent delinquency	-.070	.301	.054	.817	.933	.517	1.682
Age*	.189	.081	5.419	.020	1.208	1.030	1.415

* $p < .05$, ** $p < .01$, *** $p < .001$
† Significance computed using an *F* distribution, not a Chi-square
Note: Degrees of freedom include imputations plus original data and therefore not reported in table

Consistent with percentages of item endorsement found in Tables 6.10 and 6.11, a great deal of similarity was found between the Curious/Bad Boundaries class and the Impulsive/Antisocial class overall. However, in addition to a significant age difference between the classes, JSAs who reported violent delinquency had an 80% greater likelihood of being in the Impulsive/Antisocial class than the Curious/Bad Boundaries class.

The Sexually Focused/Covert and the Early Starter/Opportunist classes seemed to come from more troubled home environments than the Curious/Bad Boundaries class, as violence among adults in the home was associated with greater than double the likelihood of being in either of these classes. Differences between the classes will be explored in great detail in the next chapter.

Question 2 Results Summary

It was hypothesized that those with high levels of family problems would be present in one or more classes, and that the majority of the sample would show clear evidence of family challenges. This hypothesis was supported. Controlling for age, violence among family members, lots of moves and/or homelessness, and low attachment to mother explained class differences.

It was also hypothesized that mental health symptoms would be present in one or more classes, accounting for a minority of the sample. This hypothesis was partially supported: symptoms of anxiety, which were present in a minority of the sample, differentiated one class from the others. However, while depression was marginally significant in Chi-square testing, it did not help explain class membership.

Finally, it was hypothesized that JSAs who committed only sexual offenses would appear in one unique class that representing the lowest proportion of the sample. This hypothesis was

not supported. While those who committed only sexual offenses represented a very small proportion of the sample, this variable did not help explain class membership.

6.4 Question 3 Results

Can JSAs be classified more broadly according to sexual crime characteristics, family contexts, mental health, and concurrent delinquency? For the final question of the study, I conducted latent class analyses that included the sexual crime characteristics from the previous latent class analysis (see Tables 6.1 and 6.9, and Fig. 6.1) and items from the logistic regression (see Table 6.12). I was not able to clearly identify the most appropriate number of classes, as neither the fit indices nor interpretability left me with a high degree of confidence in any of the models tested. Specifically, there was neither clear agreement on number of one-through-five classes among the AIC, BIC, or ABIC, nor did the BLRT results reject the null hypothesis that any given class LCA model was adequate to describe the population versus the alternative hypothesis that a $(k + 1)$-class was required. I did not test any model greater than a five-class solution, as it was clear to me that I would not have been able to confidently interpret such a model. Fit indices for one through five class models are shown in Appendix C.
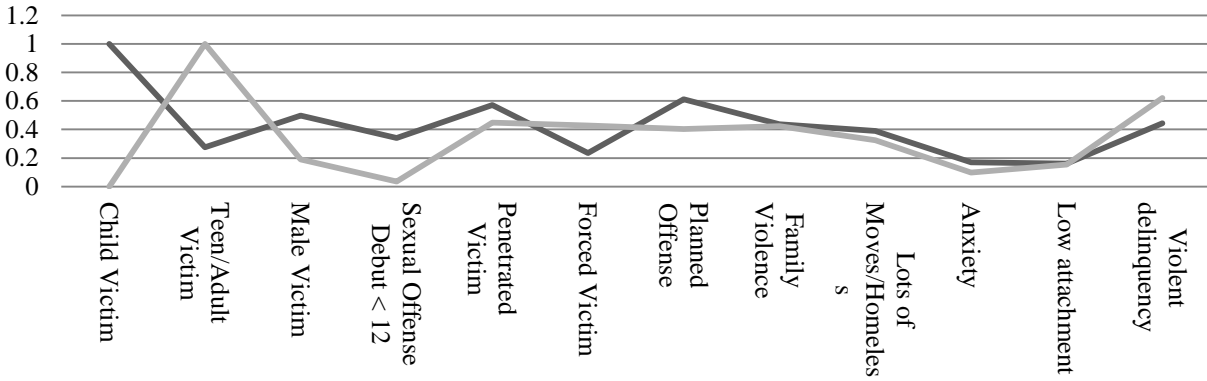
Figure 6.3 Probability of Item Endorsement, Two Classes
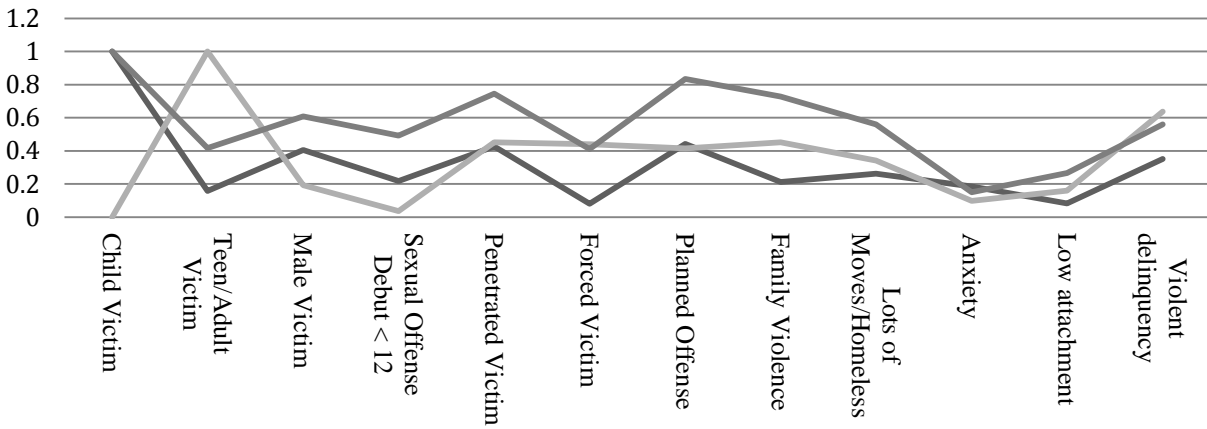
Figure 6.4 Probability of Item Endorsement, Three Classes
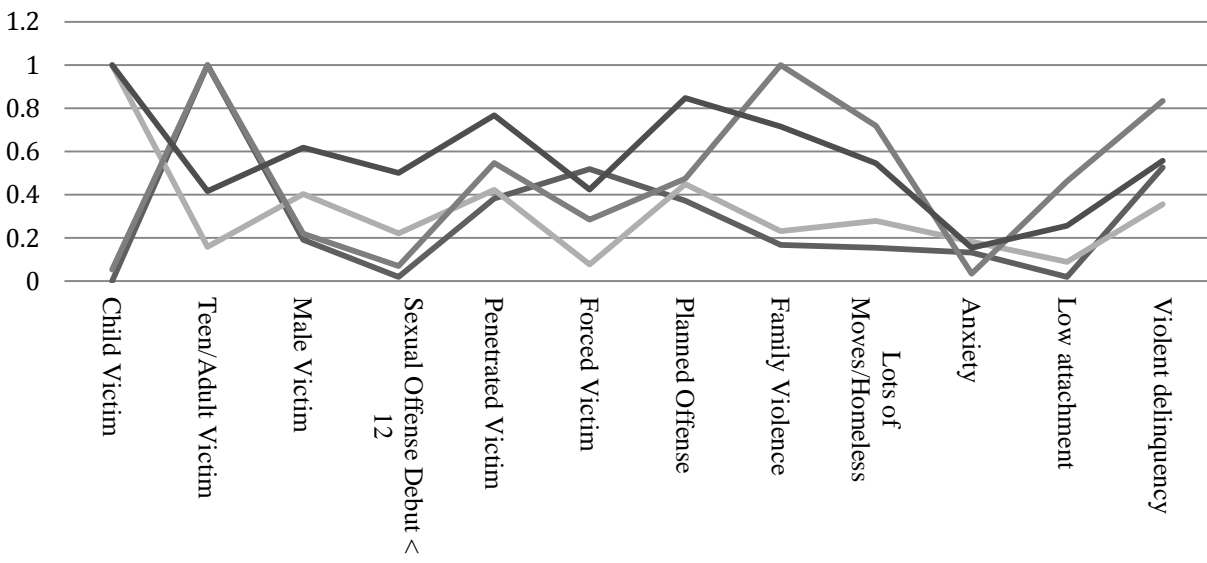
Figure 6.5 Probability of Item Endorsement, Four Classes

I graphed the results to explore possible differences visually. Figures 6.3, 6.4, and 6.5 reveal the line graph outputs from LCAs with two classes, three classes, and four classes, respectively. Two things were clear from these: first, the addition of the variables from the logistic regression resulted in weaker class clarity on the basis of sexual crime characteristics. Second, it was clear that the impact of the two family variables in the model (violence and homelessness) contributed to the separation of class differences in profound ways.

Due to the notable differences observed on the line graphs, I suspected there might be more to understand from this latent model and tested classification accuracy using the average posterior class probability (AvePP) recommended by Nagin (2005). As noted earlier, a minimum (AvePP) of .70 indicates well separated classes and accurate class assignment. I tested the four class solution, as the AIC and ABIC fit indices suggested this was the best fitting model. Using the four class solution, each of the classes were well within the minimum accepted mean, ranging from .79 (*SD* = .17) to .89 (*SD* = .17).

In the line graphs presented in the figures above, the progression from two, to three, to four classes made it clear that the strongest separation was on the basis of family violence and transience. In the three class solution, there were two classes of JSAs with child-only victims and one class with peer and/or adult-only victims. In this model, JSAs with child victims only split into two groups, one of which appeared very similar to the peer and/or adult-only victim class, and the other that was notably higher on family violence and transience. As I estimated four classes, the peer and/or adult-only victim group appeared to split, with one class appearing high on these variables, and the other remaining lower.

To explore this relationship further, I completed a series of latent class analyses in which I eliminated variables that didn't separate the classes as well, similar to a step-down method in

regression analysis. However, none of the fit statistics held well enough to offer interpretable models for comparison.

Question 3 Results Summary

It was hypothesized that three or more classes would be well identified on the basis of sexual crime characteristics, as well as family, mental health, and concurrent delinquency. This hypothesis was partially supported: A latent class model with adequate fit statistics and strong interpretability was not well identified. However, comparing the line graph outputs of two-, three-, and four-class models, it was clear that differences in some family problems have the strongest effect in distinguishing JSAs when included with indicators for sexual crime characteristics, anxiety, and violent nonsexual delinquency.

CHAPTER 7

DISCUSSION

The purpose of this study was to examine the relationship between sexual crime characteristics and family contexts, mental health, and nonsexual delinquency among a sample of juvenile sexual abusers (JSAs). The intent was to understand how the etiology of juvenile sexual abuse may be advanced by identifying latent classes with sexual crime characteristics, and exploring these classes through a broader lens of contextual factors. Three questions were addressed: 1) Do latent classes of JSAs emerge based on sexual crime characteristics?, 2) What is the relationship between classes of JSAs derived from their sexual crime characteristics with their family contexts, mental health, and concurrent delinquency?, and 3) Can JSAs be classified more broadly according to sexual crime characteristics, family contexts, mental health, and concurrent delinquency? That is, is it possible to clearly identify latent classes using sexual crime characteristics along with variables for family context, mental health, and concurrent delinquency?

7.1 Key Findings

Guided by rational choice theory and social learning theory, and building from previous research, three key findings are discussed. The primary finding was that classes of JSAs can be identified in a large data set using sexual crime characteristics alone, rather than using single crime characteristics, such as victim age, to subtype (e.g. Fanniff & Kolko, 2012) or an additive scale of sexual crime characteristics included with other factors. There have been a few previous attempts to create typologies of JSAs, although these have been rooted in theoretical assumptions that overlap with general (nonsexual) delinquency, such as personality structure and substance abuse (Hunter et al., 2003; O'Brian & Bera, 1986; Prentky et al., 2000; Worling, 2001).

The second key finding in this study was that family factors might weigh more heavily in JSA heterogeneity than has been previously understood. Contrary to the findings of others who have found that JSAs in either community (Becker et al., 1986; Saunders et al., 1984) or residentially based samples (Ford & Linney, 1995) tend to come from single parent homes, most of the JSAs in this sample came from households headed by two adults. Rates of family problems were nonetheless quite high, suggesting a great deal of familial instability. After all significant variables from the final logistic regression model were added to the sexual crime characteristics in latent class testing, different classes emerged most clearly when domestic violence and family transience were included in the original latent class model.

A third key finding was that anxiety, attachment, and nonsexual violence also seemed to differentiate classes of JSAs that had emerged from sexual crime characteristics. While these variables did not differentiate classes in later analyses as well as domestic violence and transience, it was clear that these provide malleable targets of intervention for researchers and practitioners to explore. These key findings and their implications for social work theory, practice, policy, and research are discussed.

7.2 Sexual Crime Characteristics

Latent classes of sexual crime characteristics. Two important things to be reminded of with regard to latent class analysis are: 1) participants are assigned to a single class with no overlap, and 2) all participants in each class have an equal likelihood of endorsement to the variables in the model. In other words, a randomly selected JSA from any single class in the current study had an equal likelihood of having endorsed a given variable as all other members of the class. In this discussion, members of classes are explained in terms of being likely to endorse a variable ($> 70\%$), or not likely to endorse a variable ($< 30\%$). For variables that were

estimated at likelihoods between 30% and 70%, it can be inferred that not enough members endorse the item or fail to endorse the item to make it a defining characteristic of the class when all other variables in the model are considered.

While the classes in the current study were data driven, the descriptions of classes were informed by my clinical experience with hundreds of JSAs, as well as the opinions George Leibowitz and David Burton, both of whom are social work clinicians with M.S.W.s and researchers with Ph.D.s who specialize in JSAs. Dr. Burton was also the Principal Investigator of the original study. Together, we agreed upon profiles of each class while acknowledging that more research will be necessary to test the hypothesized profiles with subsequent samples. Naming the classes was a creative exercise in which I used adjectives to capture the behaviors of a composite of JSAs who endorsed these characteristics in my clinical work. For each class, I had the behaviors of specific clients in mind and tried to identify consistent behavioral patterns among them. Therefore, class names that include opportunist or covert, for example, are not intended to be pejorative indications of the character or personality of the JSAs within these classes, but simply descriptions of the behaviors I tended to observe among youths who shared these sexual crime characteristics. Readers must keep in mind that drawing conclusions about any individuals in a class that has been described by only a handful of static characteristics should be done with great caution.

Curious/Bad Boundaries (CBB). The CBB class was the largest class in the sample, with nearly two-thirds of the participants receiving this as a best class assignment. JSAs in this class were likely to have started their sexual offending at age 12 or older and to have a child victim. They were unlikely to have used force, or to have a teen or adult victim. These characteristics are also consistent with the majority of JSAs in my community based practice. My colleagues and I

have found that clients with these characteristics tend to have underdeveloped social skills, do poorly in school, and spend a lot of time on their own. With limited-or-no appropriate outlets to discuss their bourgeoning sexuality, much less to explore it, these young people do not typically have the same social opportunities that many other adolescents have. With access to a trusting child (often a younger sibling), these are JSAs who have typically persuaded a child into sexual interactions as part of a game or in exchange for candy or toys.

    Impulsive/Antisocial (IA). The next largest class in the sample was the IA class. These JSAs were unlikely to have a child victim, male victim, or a sexual offense under the age of 12, but likely to have a teen or adult victim. This also tends to be the second largest group of JSAs in my clinical practice; they tend to be youths who have committed sexual offenses as part of a constellation of impulsive behaviors. Like JSAs who might fall into the CBB class, my colleagues and I agreed that these youths also tend to perform poorly in school, although they are more skilled socially than those in the CBB class and therefore have more opportunities to explore their sexual interests. These are typically youths with an array of violent and destructive behaviors that have gotten them into trouble in school and with adults more generally. In our experiences, this subtype of JSA is more likely than other types to have gained a certain amount of social cache among peers as an athlete and/or a bully.

    Sexually Focused/Covert (SFC). The SFC class is smaller than the previous two classes. Like the CBB class, JSAs in this class were likely to have only child victims and to have started their offending at age 12 or older. However, unlike the CBB class, they were also likely to have used penetration and to have planned their offenses. Unlike any of the other classes, those in the SFC class were also likely to have had male victims. My colleagues and I agreed that JSAs who present clinically with this combination of sexual crime characteristics have often been some of

the more challenging youths to work with for a number of reasons. Primary among these is that the family has been a barrier to treatment due to acute problems the adults have related to violence, poverty, homophobia, and/or substance abuse.

Early Starter/Opportunist (ESO). The ESO class was the smallest of the four classes and likely the most severe of the subtypes of JSAs. These JSAs had a minimum of two victims, as they were likely to have both a child victim and an adult or teen victim. Like the SFC class, they also were likely to have used penetration and to have planned their offenses. Clinically, we agreed that, similarly to those in the SFC class, these JSAs often present with histories of little supervision in the home, or homes that were profoundly troubled in terms of poverty, physical abuse, sexual abuse, substance abuse, and any number of family problems. Unlike the other classes, JSAs in this class were likely to have started their offending at age 11 or younger. In clinical work, we often found that these JSAs abused multiple siblings and/or neighborhood kids, or abused at least one victim over a period of years.

To underscore the potential utility of these classifications, I will highlight the contribution of this finding as it relates to two of the variables therein: victim age, which has been most commonly used in the JSA categorization literature, and victim sex, which is commonly used to categorize JSAs, but lacks empirical evidence for recidivism risk or possible treatment implications.

Victim age. Victim age is the most common sexual crime characteristic used in the literature to categorize JSAs, having been analyzed in no fewer than 30 studies to-date (see critical review by Keelan & Fremouw, 2013). Results in the current study not only underscored the robust evidence for the importance of this variable in understanding JSA heterogeneity, but

also uncovered a greater amount of variance within victim age subtypes than has been previously identified.

Most researchers who have explored subtypes of JSAs according to victim age have done so using two groups: those with child-only victims and those with peer and/or adult-only victims. The current study was one of seven I found that included a third group for comparison: JSAs with both child and peer/adult victims, typically referred to as mixed offenders (Fanniff & Kolko, 2012; Joyal et al., 2016; Kemper & Kistner, 2007, 2010; Leroux et al., 2016; Parks & Bard, 2006; Richardson et al., 1997), and had the largest sample (by more than two hundred) among three-group comparison studies.

Results from the logistic regression demonstrated that the IA class, which was likely to have teen and/or adult-only victims, was significantly more violent than the other three classes, all of which were likely to have child victims. This supported the findings of those who have found that JSAs with peer and/or adult victims are more violent than those with child victims (Hart-Kerkhoffs et al., 2009; Hendriks & Bijleveld, 2004). However, these same studies also found that JSAs with peer and/or adult-only victims were also more likely to have used force in their sexual offenses than JSAs with child-only victims. In the current study, those with a greater likelihood for child-only victims were not a monolithic group of JSAs, but appeared in two classes (CBB and SFC). Only membership in one of these (CBB) was associated with a lack of force, while those in the SFC class were neither likely nor unlikely to have used force. This suggests that, for some JSAs with child-only victims, the use of force in a sexual offense is unrelated to the commission of nonsexual violence. This is a new finding which may help explain inconsistencies in previous JSA typology research regarding the relationship between nonsexual violence and sexual offending (Hunter et al., 2003; Worling, 2001).

Finally, it was not surprising to find that having an early sexual offense debut was positively correlated with having a child victim (see Table 6.2), as this is consistent with the work of others who have found that JSAs with child victims tend to be younger than those with older victims (Aebi et al., 2011; Hart-Kerkhoffs, Doreleijers, Jansen, van Wijk, & Bullens, 2009; Hendriks & Bijleveld, 2004). It is notable that nearly a quarter of the sample (23%) reported having made his sexual offense debut under the age of 12 given that the mean age of the sample was nearly 17, and only three individuals in the sample were 12 or younger at the time of data collection (see Table 5.1). As previously reported, most research has used administrative data to report the age at the time of the adjudicating offense. It is likely that the findings in this study, which come from self-report data, provide a more accurate representation of JSAs who started their offending younger than do many extant studies of JSAs.

Victim sex. The current study also supported the work of researchers who found that having a male victim is more likely among those with child-only victims compared to those with peer and/or adult-only victims (Fanniff & Kolko, 2012; Gunby & Woodhams, 2010), or with mixed offenders (Kemper & Kistner, 2007; Richardson et al., 1997). However, as with nonsexual violence, there was a notable difference between the two classes that were likely to have child-only victims (CBB and SFC). Only the smaller of these (SFC) was also likely to have male victims, while the CBB class was neither likely nor unlikely to have male victims. It is notable that, in addition to having a male victim, the SFC class was also likely to have penetrated victims and to have planned offenses, while neither was the case for the CBB class. This finding reinforced that JSAs with child-only victims represent more than one subtype of JSA, suggesting that it might be inappropriate to continue to categorize them as a single subtype of JSA.

For example, in my clinical practice, many JSAs who have at least one male victim identify as heterosexual. This is especially true when the male victim is a child family member. However, there are also some who are homosexual or bisexual and living in environments where an expression of homosexual interest is not socially acceptable. In some cases, in addition to the presence of other risk factors for becoming a JSA (such as having been sexually abused), a contributing factor to committing a sexual offense has been homosexual arousal conflated with the fear for expressing sexual interest in a peer.

7.3 Family Factors

The high rate of family problems observed in this sample is consistent with the work of previous researchers who have found evidence for a variety of concurrent family challenges in studies of JSAs (Burton, 2008; Knight & Sims-Knight, 2004; Letourneau et al., 2009). Specifically, high levels of substance abuse by adults in the home, violence in the home, and other antisocial behaviors within the family were reported in this sample (Ford & Linney, 1995; Knight & Sims-Knight, 2004; Lightfoot & Barbaree, 1993; Saunders et al., 1984). Results from the correlation matrix of family problem characteristics showed significant positive correlations between nearly all pairs of variables, suggesting that JSAs with one family problem often have more than one family problem. Notable among the relationships of JSA class membership was violence among adults in the home and high levels of transience. Along with low attachment to mother, these family problem indicators performed strongest in logistic regression analyses and remained in the final model.

In subsequent latent class analyses, the influence of domestic violence and family transience on JSA classification became clear. As I added variables from the logistic regression that best predicted class membership to the variables in the original classes based on sexual

crime characteristics alone, the influence of low attachment to mother, anxiety, and nonsexual violence all but disappeared, while there was clear separation of classes with regard to these family problem variables. Although the fit statistics were not clear for any of the models estimated, the clearest story was told with four classes. As with the results from the LCA with sexual crime characteristics only, there were two classes likely to have had child victims and two classes likely to have had teen or adult victims, while evidence for a class of mixed offenders was more opaque. However, the strongest separation in the model after victim age came from having witnessed domestic violence and transience, with one of the child victim classes and one of the teen or adult victim classes showing high probabilities for both, and the other two showing low likelihoods for both. This provides further evidence that subtyping JSAs only on the age of victims is not sufficient in understanding their etiologies.

Family violence. There is little research on how families influence subtypes of JSAs. However, results in the present study were in alignment with the work of those who found that witnessing domestic violence was prevalent among JSAs (Caputo et al., 1999; Ford & Linney, 1995). Results revealed that domestic violence might also explain some of the heterogeneity within JSAs. Those in the SFC class and in the ESO class were more than twice as likely to have reported witnessing violence in the home than were JSAs in the largest class, CBB. It is noteworthy that these same two classes were also more likely to have penetrated their victims and to have planned their offenses. There are a variety of reasons why JSAs commit sexual offenses. For some, these reasons likely include seeking power and control when they feel powerless in other relationships (Leibowitz, 2012). It is possible that, for some JSAs, witnessing domestic violence in the home is associated with feelings of powerlessness and might therefore be part of the motivation to commit sexual offenses.

Family transience. This study is the first study to report on homelessness and/or lots of moves among JSAs specifically, although the findings support those of others who have found that families of JSAs often struggle with regard to material resources (Saunders et al., 1984; Yoder & Brown, 2015). In the current study, JSAs in the SFC class were twice as likely as the CBB class to experience high levels of homelessness or moves, while transience was not significant for any other class. Is it possible that these youths had more exposure to adult sexuality due to the tight quarters often associated with those living in poverty?

The lack of significance between the type of family raised-in (e.g. two parent) and class membership is also worth highlighting in the context of family, as youths from single parent homes have consistently been found to be more delinquent than those from intact families (Gove & Crutchfield, 1982; Lamborn, Mounts, Steinberg, & Dornbusch, 1991; Rankin & Kern, 1994; Wells & Rankin, 1988). One explanation given for this is that single parent homes lack the level of supervision and parental involvement found in two parent households (Demuth & Brown, 2004). Given the high level of concurrent delinquency in this sample of incarcerated youths, it was surprising that the most frequent response given to "type of family raised in" was "two parents" and that, in aggregate, the majority were either raised by two parents or a parent and the parent's partner. As noted earlier in the chapter, this finding was contrary to the findings of others who have found that JSAs tend to come from single parent homes. One possible explanation for the contrary finding in the current study is that previous JSA studies were limited by small samples (< 70), whereas the current study of 573 JSAs provided a more accurate representation of residentially based JSAs.

7.4 Attachment, Mental Health and Violence

      Low attachment. Other JSA researchers have found low parental attachment to be associated with sexual abusing by JSAs in general (Miner et al., 2016). In the current study, the classes showed varied attachment to mother. That the ESO class was nearly three times as likely as the CBB class to show low attachment to mother was notable, particularly given the lack of variance in the types of homes these classes were raised in. This might suggest that, for some, there is an increased risk associated with becoming a JSA related to low attachment to mother regardless of the type of family one is raised in.

      Anxiety. Findings from this study supported the meta-analysis of Seto & Lalumière (2010) in which anxiety was found to be a distinguishing characteristic among JSAs. In the current study, anxiety was associated with class membership in only a single class, ESO, the same class to be distinguished by low attachment to mother. Subscales on the total attachment measure are trust, communication, and alienation. It is easy to imagine that a youth who does not trust his mother, cannot communicate with her, and feels alienated by her would also be an anxious youth. However, more needs to be understood about this relationship. Later in this chapter, I offer a suggestion for an area of future item measurement to explore this relationship further.

      Violent delinquency. High levels of delinquency and violence were expected in the incarcerated sample of JSAs investigated in the current study. The finding that the IA class was distinguished from the other classes by high levels of nonsexual violence was consistent with the interpretation of the classes, as these JSAs were nearly twice as likely as the CBB class to have reported an act of nonsexual violence, perhaps suggesting higher levels of impulsivity. It was unexpected that there wasn't one or more classes distinguished by levels of nonsexual

delinquency more generally, as others have found differences between subgroups of JSAs marked by level of delinquency (Butler & Seto, 2002; van der Put et al., 2013). One possible reason for the inconsistency here is that a residential sample was used, rather than a community sample or a mixed sample.

7.5 Implications for Theory

The findings in this study underscore how the economic lens of rational choice theory can be used to frame sexual offending among JSAs. It was notable that, despite the tendency among researchers to categorize JSAs with child-only victims as a single class (Keelan & Fremouw, 2013), two classes of JSAs emerged that were marked by a high likelihood of child-only victims. It is possible that a small proportion of these youths chose child-only victims due to pedophilic (sexual arousal to prepubescent children) urges (Akakpo & Burton, 2014), as is more commonly the case with adults who sexually abuse children (Abel et al., 1989; Seto, 2010). However, this is not likely the case for the majority of JSAs with child-only victims. Rational choice theory could be used, for example, to explain that JSAs in the largest class, Curious/Bad Boundaries, chose child-only victims due to their perception of a scarcity of appropriately aged individuals with whom to safely explore their sexual urges (Cortoni & Marshall, 2001; Murphy et al., 2001) and easy access to younger siblings or another child (Kaufman et al., 1998, 1996). This would support the findings of Miner and colleagues (2010), who found that some JSAs with child-only victims show greater anxiety toward peers and adults than JSAs with older victims and view sex with children as a way to gain intimacy. In my clinical work, it is common for clients to have at least one victim who is a younger sibling, step-sibling, cousin, or a neighborhood child entrusted to the supervision of the JSA on a regular basis.

Some of the variables explicated in social learning theory were also important in the current study, as has been found by others in the JSA literature (Burton et al., 2002; Burton, 2003). Consistent with other studies of JSAs, high rates of family problems were observed in the sample (Baker et al., 2003; Caputo et al., 1999). For reasons that are not clear, it was evident that family problems functioned differently in the etiologies of JSAs depending on their latent class. For example, the Sexually Focused/Covert class showed the highest levels of illegal activity by adults and family transience among the four classes. In my clinical experience, these JSAs are also likely to be sexual or physical abuse victims. Therefore, it would make sense that, for some in this class, the sexualized behaviors observed were a consequence of social learning. While some may have been repeating cycles of sexualized behaviors that were done to them, others might have reenacting observed sexual behaviors of influential adults in their homes. Future studies should continue to explore the interactions of family factors and other etiological indicators (e.g. sexual victimization or physical abuse) on subsequent sexual offending by JSAs.

There were limitations to interpreting the results of the current study through rational choice theory and social learning theory only. For example, neither theory provided an adequate lens to explain the second largest class, Impulsive/Antisocial. It is possible that many of these JSAs suffered from biological issues related to their behaviors, such as ADHD, therefore making this class less interpretable by social science theory. Furthermore, I considered an alternative theory for how some of the results might be interpreted. There was some evidence to support Moffitt's (1993) dual taxonomy of antisocial youths, which has repeatedly been used to point out that the majority of delinquent youths are adolescent-limited in their antisocial behaviors, while a small minority of antisocial youths start their offending patterns earlier in childhood and are life-

course persistent in their offending (Moffitt, Caspi, Harrington, & Milne, 2002; Moffitt, 1997, 2006).

In bivariate analyses, early sexual offense debut was negatively correlated with the use of penetration and positively correlated with planning sexual offenses. However, in the latent class analysis, the smallest class, Early Starter/Opportunist, was marked by a high likelihood for both, as well as a minimum of two victims (child and teen/adult). Given that these youths started their sexual offending at age 11 or younger, and that the mean age of first ejaculation has been estimated between 13 and 14 years old (Tomova et al., 2011), the negative association to penetration might suggest that for some, the motivation to commit sexual offenses wasn't driven by sexual arousal, but something else. In other words, it is possible that, for some JSAs, non-penetrative sexual offenses were unrelated to sexuality and instead were part of a constellation of inappropriate behaviors related to trauma or mental illness. While this manuscript has cited robust evidence to support the claim that only a small number of JSAs go on to sexually reoffend in adulthood, it has been found that the most severe adult offenders started their sexual offending as juveniles (Harris, 2013). If life-course persistent JSAs exist, it would make sense that this is one of the subsets from which they are drawn.

7.6 Policy Implications

The results in this study contribute to the growing body of evidence that the Adam Walsh Child Protection and Safety Act of 2006 (AWA) and similar state-level sex offender policies requiring public notification and registration of JSAs are misguided and inappropriate (Batastini, Hunt, Present-Koller, & DeMatteo, 2011; Harris et al., 2015; Letourneau, Armstrong, et al., 2013; Letourneau et al., 2010; Letourneau & Miner, 2005) . Even though treatment providers (Harris et al., 2015) and juvenile and family court judges (Bumby, Talbot, & West, 2006) across

the United States have expressed concerns regarding the placement of JSAs on registries, public

support for such policies remains high (Levenson et al., 2007; Salerno et al., 2010).

One of the primary functions of these systems is to assign risk levels of reoffending to

adults and juveniles. Under the AWA, for example, Tier 1 represents the least dangerous type of

offender, while Tier 3 represents the most dangerous. Sexual contact with children under age 13

is one of the offenses under which an offender automatically receives a Tier 3 designation, with

no distinction made between adults and juveniles. Therefore, if JSAs in the current sample were

drawn from states that were in compliance with AWA at the time of their convictions, at least

three quarters would have been automatically assigned to Tier 3. Such an assignment means an

automatic life sentence on a publicly available registry, as well as in-person registration with

local police four times annually. Upon release from their residential programs (and for the rest of

their lives), these youths would face restrictions on where they could go to school, play sports,

work, and travel, and their families would face residency restrictions that might require

immediate relocation if they lived within a prohibited zone.

All JSAs in the largest class from this study had victims younger than age 12 and

therefore would be Tier 3 sex offenders according to the AWA. These JSAs have also often

committed offenses that do not involve force or penetration. In my clinical experience, they tend

to be nonviolent, shy, and naïve young people who lack social skills and do poorly in school. As

with all classes identified in this study, many in the CBB class were likely sexual abuse victims

and/or experienced other forms of physical abuse or neglect. Already facing such challenges, it

would seem that increasing social isolation and depriving these young people of opportunities for

school, work, housing, and relationships is perhaps more likely to increase their risk of sexual

reoffending as adults (Marshall, 2010), than to decrease it. It is little surprise that JSAs on sexual

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offender registries have shown worse outcomes and an increase in subsequent nonsexual crime when compared to JSAs who have not appeared on registries (Letourneau & Armstrong, 2008).

To combat the effects of automatic sentencing on JSAs, at least one state has begun to disproportionally allow JSAs to accept plea deals for reduced charges (Letourneau, Armstrong, et al., 2013). Obviously, this is not an appropriate long term solution to a misguided policy. Instead of spending money to register and monitor JSAs as if they were adult sex offenders, it might make sense to allocate resources to treatments based on the specific mental health and/or family needs of JSAs. For example, in the current study, I found evidence to suggest that family problems were high among all JSAs in the sample, but that domestic violence and family transience disproportionately affected two of the classes that showed more severe sexual offending behaviors. Currently, state registry boards and JSA risk assessment tools do not account for the needs of the families of JSAs. It seems possible that JSAs from families with unstable living situations would pose a decreased risk of future sexual and nonsexual offending if state assistance was provided in the form of stable housing. The findings from the current study provide evidence to suggest that families not only need to be included in JSA treatment when possible, but providing support for families marked by histories of physical and sexual abuse, domestic violence, and transience might be an effective primary prevention measure in reducing sexual offending by juveniles.

7.7 Practice Implications

Results from the current study can be used to support best practice recommendations set by the National Association for Social Workers (Workers, 2008), emphasizing individualized treatments that consider the context of an individual. Others have also argued that JSAs should receive treatment that recognizes the context of their lives (Becker & Hicks, 2003; Longo, 2003),

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although it is not clear what this looks like in practice. While recidivism risk tools for JSAs (e.g. ERASOR) have been quite useful for properly trained clinicians as a mechanism for collecting targeted background information and providing an overall picture for how a number of risk indicators might influence future behaviors (Viljoen et al., 2012), such tools do not inform treatment, leaving a gap for evidenced-based practices (Metzner et al., 2009; Ryan, Leversee, & Lane, 2010). As a consequence, JSA treatments are more likely to vary according to the styles, training, and beliefs of the treatment providers than by the JSAs themselves.

Family. By classifying JSAs according to sexual crime characteristics and comparing these classes by family problems, I am able to provide support for prior recommendations to have JSA treatment extend beyond the youths as individuals and include families whenever possible (Friedrich & Sim, 2006; Gray, Busconi, Houchens, & Pithers, 1997; Letourneau et al., 2009; McCuish, Cale, & Corrado, 2015; Yoder & Brown, 2015; Yoder & Ruch, 2015). In my practice, I have found that most caregivers are willing to become participants, albeit some more actively than others. As found by Yoder and Ruch (2015) in their qualitative analysis of JSA treatment providers working with families, I have found that the best treatment outcomes tend to result from a strengths-based approach when I have been able to build a successful rapport with families. To date, multi-systemic therapy (MST), which requires families to be active participants in treatment, is the single evidenced-based treatment to have shown efficacy in randomized trials to reduce both sexual behavior problems and nonsexual reoffending among JSAs (Borduin, Schaeffer, & Heiblum, 2009; Letourneau, Henggeler, et al., 2013; Letourneau et al., 2009).

However, not only is it unrealistic to assume that every JSA has a family that is able and willing to participate in MST, which requires a high level of active participation over many

months, but sometimes treatment providers may choose to not include family in JSA treatment due to issues of safety in the home and/or emotional and physical instability among family members (Kolko, Noel, Thomas, & Torres, 2004; Zankman & Bonomo, 2004). In the current study, rates of domestic violence were found to be quite high. It might be unreasonable to expect a family with high levels of partner violence to take an active role in treatment targeting the JSA. Therefore, it is also important to consider the possible implications of this study on individual and group treatment.

Group treatment. In a recent meta-analysis of sexual offender treatment effects for JSAs and adults, programs were described according to theoretical orientation, (e.g. cognitive behavioral treatment) or location (e.g. community), but descriptions of treatment modalities (individual or group) were not provided (Kim et al., 2015). The likely reason for this, and the reason why modalities are typically not described in the literature, is because group treatment is assumed to be the primary modality for all non-biologically based JSA treatments. In my personal experience as a practitioner and consultant, I have never heard of sexual offender treatment programs that don't include group work as either the only psychotherapeutic treatment, or as a principal component of treatment. Although the classes identified in the current study will require subsequent analyses before they can be confirmed, the clear separation of classes according to victim age and family indicators might suggest that treatment providers seeking higher levels of group homogeneity consider these indicators.

Follow-up analyses are necessary before specific treatment recommendations can be made according to classes. However, there was one class (IA) identified in the model that stood out as contraindicated for group sexual offender treatment in many circumstances. Of the four classes, youths in the IA class, who were unlikely to have a child victim or male victim, but with

significantly more nonsexual violence in their histories, are youths who tend to be more antisocial and aggressive than the others and less likely to identify with JSAs who have sexually abused children or males, regardless of age. Due to homophobia and the social stigma attached to child sexual abusing, these are youths in my practice who tend to see themselves as less deviant than the others. Due to these same social forces, others in the group tend to agree with them. When these youths are able to assume power and control in the group through intimidation or by capitalizing on the social desirability of others, the group process can be rendered ineffective.

Assigning JSAs in the IA class to their own a separate group is also not recommended, as highly antisocial youths are likely to compete with one another for control of the group rather than to work cohesively. This might be why the authors of a recent systematic review found no evidence of treatment efficacy in a widely used treatment model (Aggression Replacement Therapy; ART) that targets populations of highly antisocial adolescents and adults in group treatment (Brännström, Kaunitz, Andershed, South, & Smedslund, 2016). Instead, these youths should receive individual treatment that targets the sources of their defensiveness and aggression. If effective, the JSA should be reassessed to determine whether or not sex-specific therapy is needed.

7.8 Limitations

Sample. Although one of the largest sample sizes of any JSA study to date, the contributions of the present study must be viewed in light of the limitations. Regarding the sample, the potential for refusal bias was slight, as nearly all JSAs at each facility elected to participate. However, information was not collected on those who did not complete the study. Therefore, differences between those who completed the instrument and those who did not cannot be identified. Additionally, data were collected in one Midwestern state and one Mid-

Atlantic state, resulting in geographical limitations. Despite this limitation, data from the Midwestern state, which comprised the majority of the sample ($n = 526$, 91.8%), were collected statewide, five years apart, and represented JSAs from rural, suburban, and urban settings. In contrast, most JSA studies have drawn samples from a single point-in-time at one facility, and therefore contain participants from more limited geographical areas.

As previously noted, the sample was comprised of youths living in secured, residential, state-run facilities (juvenile incarceration). Some have found that residentially based JSAs tend to report more severe and greater amounts of nonsexual delinquency than general delinquents committed to the same facilities (Brown & Burton, 2010; Burton et al., 2002). Therefore, such facilities are likely to have an overrepresentation of youths with severe behaviors and criminal histories, whereas most youths adjudicated for sexual offenses remain in their communities and are sentenced to probation and outpatient treatment. This positions the current study as an in-depth exploration of the most severe JSAs, which is a strength of the study, although it does not provide a comparison study with matched samples of community-based JSAs. Furthermore, the bar for entry into the juvenile justice system can vary from jurisdiction to jurisdiction, limiting the ability to generalize the current study's sample to JSAs who have either pled-down to lesser charges or had charges dismissed. An additional issue with generalizability for all studies of JSAs is that the vast majority of sexual offenses are not reported to police, justice officials, or treatment providers: it is not possible to study individuals who have not been identified.

Design and measures. The design of the study was cross-sectional. Although my clinical experience leads me to assume an ordering effect on some of the relationships observed (e.g. family context likely preceded sexual crime), causality cannot be established. The study used self-reported measures that asked questions retrospectively.

Missing data and social desirability. Missing data was a limitation in this study. Missing

items were not unexpected, as all data were collected from self-report instruments and some

questions asked about illegal and antisocial behaviors. Multiple data imputation methods were

used, as were cut-points for scaled data. Justification for each decision point was provided in

Chapter 5. While the imputation methods described have limited the bias introduced by missing

items, it is important to acknowledge that such methods introduced potential measurement bias

to the study, as standard errors may have been artificially reduced. There is no way to know the

degree to which missing data affected the outcomes reported in this study.

Rather than using official records to collect data such as demographics and sexual crime

histories, researchers relied on the participants' impressions of events (e.g. illegal activities

among adults in the home) and their willingness to be truthful to the best of their abilities.

Despite the highly sensitive nature of some items, there is precedent to assume that the responses

given are valid. According to JSA researcher and author, David Burton, Ph.D. (personal

communication), he and other researchers who have used self-report data with JSA populations

have found scores on measures of social desirability to be low, although these authors have failed

to include social desirability results in publications.

7.9 Directions for Future Research

Several directions for future research emerge from this dissertation. While there are a

variety of clinical tools aimed at estimating recidivism risk among JSAs by using the additive

properties of risk indicators (i.e. J-SORRAT-II, J-SOAP-II, and ERASOR), these tools have not

been successful at empirically predicting sexual offense recidivism among JSAs. This is at least

partially due to the wide variance reported in how well these instruments disentangle the risk for

sexual recidivism from the risk for nonsexual delinquency (Viljoen et al., 2012). While I am

unable to make claims predicting recidivism from the current study, the latent classes of JSAs based on sexual crime characteristics offer a new direction for researchers to consider in the development of such tools. There was clear evidence that sexual crime characteristics work correlatively and not independently of one another. Future work should consider that correlative properties of characteristics might go further in predicting risk than additive properties.

Another research implication from the findings in this study is the need for a more comprehensive measurement of the impact of family on sexual offending. Previous research has provided evidence of a clear relationship between types of victimization, which often involves family, and subsequent offending (Burton, 2003), although less is known about the mechanisms involved in the victim-to-victimizer relationship. Findings in the current study can be used to show the strong impact of family on classes of JSAs, but greater details regarding the quality of the relationships would aid in understanding how families impact sexual offending.

Finally, to strengthen the findings of this study, confirmatory community samples will be needed. While the bar for entry into a residential treatment program can vary widely, JSAs in community based samples are likely to have committed less severe crimes and/or fewer crimes, and are less likely than residentially-based youths to pose imminent dangers to themselves or others. If the latent classes look different in community based samples, it will be important to compare these differences.

Items for future measurement. For future investigations, it will be important to consider the relationship of classes to items not measured in the current study. One item to measure is the experience of sexual victimization by class. As cited, JSAs are more likely than other youths to be the victims of sexual abuse. In the current study, domestic abuse, transience, and low attachment had different effects on class membership, reinforcing the hypothesis that

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there is a great amount of heterogeneity in the home experiences of JSAs. Researchers in one study of residentially based JSAs found that most of the youths in their sample came from homes in which there was an adult with a sexual abuse history (Gray et al., 1997). In my clinical practice, I have worked with many youths whose mother, father, or stepparent sexually abused them prior to the youth committing his first sexual offense. In many of these cases, clients have told me they recall thinking that their mothers either knew for sure the abuse was happening and didn't say anything, or suspected and never asked. (In very rare cases, clients have told me they did report the abuse to mother and mother either didn't believe the JSA, or blamed the JSA for the sexual abuse.) It seems possible that living in a home in which one adult is sexually victimizing the youth under conditions in which the youth feels unprotected by a second adult in the home, and mom in particular, may increase the risk for later becoming a JSA (Friedrich & Sim, 2006).

A second example of an item for future measurement is pornography exposure. JSAs have reported both earlier exposure to pornography and greater consumption of pornography than general delinquents (Burton et al., 2010; Ford & Linney, 1995; Leguizamo, 2000). However, no relationship has been found between pornography exposure and any sexual crime characteristics among JSAs, including victim ages, type of offenses, age of sexual offense debut, or use of force (Burton et al., 2010). Therefore, the association with pornography consumption and subsequent sexual abuse perpetration is not clear.

Much of the pornography available on the internet depicts sexual interactions in which sex is forceful. Returning to rational choice theory (RCT), youths who live in homes where pornography is acceptable might also consider forcible sexual contact to carry less risk than youths who live in homes where pornography viewing is not acceptable. Alternatively, one

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might hypothesize that youths with stronger sexual drives are also those who seek out pornography and therefore place a higher premium on sexual contact with others, regardless of consent.

Social learning, on the other hand, could be used to frame a study that finds earlier and greater pornography consumption might be present in a home where pornography is watched with parents who also engage in sexually abusive behaviors with the JSA, thereby providing a model for subsequent abuse by the youth. Alternatively, social learning could be used to simply explain that greater exposure to a variety of the models of sexual behaviors and the rewards sometimes associated with pornographic sex (e.g. receiving and giving sexual pleasure, controlling others, role playing, etc.) would provide models for sexual offending.

Taken together, these theories might frame a more robust understanding of the relationship of pornography to sexual offending by JSAs. Perhaps some youths who are exposed to pornography are exposed by their parents or other trusted adults in the context of teaching or bonding: for example, a parent who encouraged pornography exposure in a misguided attempt to teach about sex with future consenting partners. Perhaps other youths were exposed by parents who wished to provide models for sexual abuse of children in the home. In both cases, there are subsequent rational choices being made by JSAs that are set by different social learning processes. In the first, a model of careless sexual exposure might be misread as encouragement to seek sexual contact in ways similar to those observed in pornography, including depictions of forced sexual touch. In the second example, a youth might commit sexual assault as a way of gaining approval or love from a parent.

7.10 Conclusion

The present study expanded previous investigations of heterogeneity and etiology among JSAs through two research lines: 1) exploring classifications of JSAs based on sexual crime characteristics that have been associated with sexual reoffending and 2) evaluating the relationship of class membership to family characteristics, attachment, mental health, and nonsexual delinquency. This study was unique in that four distinct classes of JSAs were identified without the use of indicators that are also present among youths who have committed nonsexual crimes.

A few important results emerged from this study. Rather than continuing to identify JSAs as monolithic subtypes according to specific sexual crime characteristics, future investigations should continue to identify how these characteristics might work together to deepen understanding of heterogeneity in this population. This study provided clear evidence to support the work of researchers and theorists who have determined JSAs to be a heterogeneous population, as well as the work of those who have found that families play a profound role in the lives of these young people. Findings in the current study can be used as evidence for researchers and practitioners to consider the importance of how family functioning both informs the etiology of JSAs and can be used differently in strategies developed to treat JSAs. Policy makers should consider that providing support for troubled families might show greater efficacy in reducing subsequent criminal offending among JSAs than public notification and registries have done. Finally, researchers should continue to explore ways of identifying young males who show profiles consistent with those who have committed sexual offenses, such as the classes suggested, and developing methods of providing a priori interventions with youths and families in an effort to prevent sexual offending by juveniles in the first place.

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Appendix A. Items for Key Variables: Attachment and Delinquency

Table A.1

Inventory of Parent and Peer Attachment (IPPA), Mother Scale

	Almost Never or Never True	Not Very Often True	Some-times True	Often True	Almost Always or Always True
1. My mother respects my feelings.	1	2	3	4	5
2. I feel my mother does a good job as my mother.	1	2	3	4	5
3. I wish I had a different mother.	1	2	3	4	5
4. My mother accepts me as I am.	1	2	3	4	5
5. I like to get my mother's point of view on things I'm concerned about.	1	2	3	4	5
6. I feel it's no use letting my feelings show around my mother.	1	2	3	4	5
7. My mother can tell when I'm upset about something.	1	2	3	4	5
8. Talking over my problems with my mother makes me feel ashamed or foolish.	1	2	3	4	5
9. My mother expects too much from me.	1	2	3	4	5
10. I get upset easily around my mother.	1	2	3	4	5
11. I get upset a lot more than my mother knows about.	1	2	3	4	5
12. When we discuss things, my mother cares about my point of view.	1	2	3	4	5
13. My mother trusts my judgment.	1	2	3	4	5
14. My mother has her own problems, so I don't bother her with mine.	1	2	3	4	5
15. My mother helps me to understand myself better.	1	2	3	4	5
16. I tell my mother about my problems and troubles.	1	2	3	4	5
17. I feel angry with my mother.	1	2	3	4	5
18. I don't get much attention from my mother.	1	2	3	4	5
19. My mother helps me to talk about my difficulties.	1	2	3	4	5
20. My mother understands me.	1	2	3	4	5
21. When I am angry about something, my mother tries to be understanding.	1	2	3	4	5
22. I trust my mother.	1	2	3	4	5
23. My mother doesn't understand what I'm going through these days.	1	2	3	4	5
24. I can count on my mother when I need to get something off my chest.	1	2	3	4	5
25. If my mother knows something is bothering me, she asks me about it.	1	2	3	4	5

Table A.2

Millon Adolescent Clinical Inventory (MACI), Items for Depressive Affect

	True	False
I would much rather follow someone than be the leader.	X	
I've never done anything for which I could have been arrested.	X	
I think everyone would be better off if I were dead.	X	
I hate the fact that I don't have the looks or brains I wish I had.	X	
Most people are better looking than I am.	X	
I see myself as falling short of what I'd like to be.	X	
Things in my life just go from bad to worse.	X	
I've never been called a juvenile delinquent.	X	
I worry a great deal about being left alone.	X	
I often feel sad and unloved.	X	
I feel left out of things socially.	X	
I'm a somewhat scared and anxious person.	X	
I often feel I'm not worthy of the nice things in my life.	X	
I sometimes feel very unhappy with who I am.	X	
No one really cares if I live or die.	X	
I often feel lousy after something good has happened to me.	X	
I don't think people see me as an attractive person.	X	
I won't get close to people because I'm afraid they may make fun of me.	X	
More and more often I have thought of ending my life.	X	
I'd like to trade bodies with someone else.	X	
Lots of things that look good today will turn out bad later.	X	
Lately, little things seem to depress me.	X	
There are times when I wish I were someone else.	X	
Lately, I feel jumpy and nervous almost all the time.	X	
I seem to make a mess of the good things that come my way.	X	
Although I want to have friends, I have almost none.	X	
My future seems hopeless.	X	
I feel lonely and empty most of the time.	X	
I like the way I look.		X
I don't care much what other kids think of me.		X
When things get boring, I like to stir up some excitement.		X
I've had a few run-ins with the law.		X
I am pleased with the way my body has developed.		X

Table A.3

Millon Adolescent Clinical Inventory (MACI), Items for Anxious Feelings

	True	False
I would never use drugs, no matter what.	X	
I've never done anything for which I could have been arrested.	X	
Sometimes, when I'm away from home, I begin to feel tense and panicky.	X	
I like others to follow instructions and so what others expect of me.	X	
I often fear I'm going to panic or faint when I'm in a crowd.	X	
I've never been called a juvenile delinquent.	X	
I worry a great deal about being left alone.	X	
I'm a somewhat scared and anxious person.	X	
I spend a lot of time worrying about my future.	X	
I don't think people see me as an attractive person.	X	
I get very frightened when I think of being all alone in the world.	X	
I often get frightened when I think of the things I have to do.	X	
Lately, I feel jumpy and nervous almost all the time.	X	
I don't need to have close friendships like other kids do.		X
I usually act quickly, without thinking.		X
Punishment never stopped me from doing what I wanted.		X
I don't care much what other kids think of me.		X
I used to get so stoned that I did not know what I was doing.		X
I don't mind telling people something they won't like hearing.		X
As soon as I get the impulse to do something, I act on it.		X
I find it hard to feel sorry for people who are always worried about things.		X
I can hold my beer or liquor better than most of my friends.		X
Parents and teachers are too hard on kids who don't follow rules.		X
I think I have a good body.		X
I'm no different from lots of kids steal things now and then.		X
I prefer to act first and think about it later.		X
I've gone through periods when I smoked pot several times a week.		X
Too many rules get in the way of doing what I want.		X
I will sometimes do something cruel to make someone unhappy		X
Drinking really seems to help me when I'm feeling down.		X
I'm very good at making excuses to get out of trouble.		X
Sex is enjoyable.		X
I sometimes get pleasure by hurting someone physically.		X
If I want to do something, I just do it without thinking of what might happen.		X
I've had a few run-ins with the law.		X
I do what I want without worrying about its effect on others.		X
There have been times when I could not get through the day without some pot.		X
I am glad that feelings about sex have become a part of my life now.		X
My parents have had a hard time keeping me in line.		X
I often have fun doing certain unlawful things.		X
When we're having a good time, my friends and I can get pretty drunk.		X
I enjoy starting fights.		X

Table A.4

Self-Reported Delinquency (SRD), Items for Nonsexual, Nonviolent Delinquency

Before I was arrested, I…	Did not do	Once a month	Once every 2-3 weeks	Once a week	2-3 times a week	Once a day	2-3 times a day
Purposely damaged or destroyed property belonging to my parents or other family members.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Purposely damaged or destroyed other property that did not belong to me (not counting family or work property).	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Stole or tried to steal a motor vehicle such as a car or motorcycle.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Stole or tried to steal something worth more than $100	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Knowingly bought, sold, or held stolen goods (or tried to).	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Purposely set fire to a building, a car, or other property (or tried to).	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Carried a hidden weapon.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Stole or tried to steal things worth $100 or less.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sold marijuana/pot/weed/hash.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Stole money or other things from my parents or other members of my family.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Used alcohol or other liquor.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sold hard drugs such as heroin, cocaine, and LSD.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Used inhalants such as glue.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Took a vehicle for a ride or drive without the owner's permission.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Used pot/hash/weed/marijuana.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Was drunk in a public place.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Used Cocaine, Coke or Crack.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Broke or tried to break into a building or vehicle to steal something or just look around.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Begged for money or things from strangers.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Used or tried to use credit cards without the owner's permission.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Used other types of drugs.	(1)	(2)	(3)	(4)	(5)	(6)	(7)

Table A.5

Self-Reported Delinquency (SRD), Items for Nonsexual, Violent Delinquency

Before I was arrested, I…	Did not do	Once a month	Once every 2-3 weeks	Once a week	2-3 times a week	Once a day	2-3 times a day
Attacked someone with the idea of seriously hurting or killing that person.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Was involved in gang fights.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Hit or threatened to hit my supervisor or another employee.	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Used force or strong-arm methods to get money or things from people.	(1)	(2)	(3)	(4)	(5)	(6)	(7)

Appendix B. Probability of Sexual Crime Characteristics by Class

Table B

Probability of Sexual Crime Characteristics by Class

	Child Victim	Teen/ Adult Victim	Male Victim	Sexual Offense Debut < 12	Penetrated Victim	Forced Victim	Planned offense
Curious/Bad Boundaries (48.61%)	1	.13	.38	.23	.38	.11	.45
Impulsive/ Antisocial (20.05%)	0	1	.20	.04	.46	.44	.41
Sexually Focused/ Covert (16.50%)	1	.02	.76	.33	.90	.45	.93
Early Starter/Opportunist (14.84%)	1	1	.53	.68	.75	.36	.77

Appendix C. Missing Items: Family, Mental Health, and Delinquency

Table C.1

Rates of Missing Family, Mental Health, and Delinquency Variables, and Covariates in Logistic Regressions * (*N* = 567)

	n	Percent missing
Anxiety	93	16.40
Depression	92	16.23
Sex only offender	77	13.58
Illegal acts by family members (other than you)	74	13.05
Placed in foster care (non-relatives)	47	8.29
Very poor (little money, food, clothes, heat, etc.)	44	7.76
Parent with alcohol or drug problem	42	7.41
Lots of moves and/or homelessness	42	7.41
Placed in group home	42	7.41
Attachment	42	7.41
Family context (e.g. two parent, single par)	41	7.23
Placed in foster care with relatives	38	6.70
Siblings placed in foster care (not you)	36	6.53
Race	37	6.53
Hitting, slapping, punching, or other violence between parents or adults at home	36	6.35
Age	18	3.17
Last grade completed	18	3.17

*In descending order of frequency

Table C.2

Rates of Missing Independent Variables of Respondents with a Best Class Assigned (N = 567)

Variables missing (out of 17)	*n (%)*
0	257 (45.33)
1	118 (20.81)
2	64 (11.29)
3	50 (8.82)
4	34 (6.00)
5	21 (3.70)
6	9 (1.59)
7	5 (0.88)
8	2 (0.35)
9	2 (0.35)
10	2 (0.35)
13	2 (0.35)
14	1 (0.18)

APPENDIX D Goodness-of-Fit Test Statistics for LCA Models with Sexual Crime
Characteristics plus Logit Items, 1 − 5 Classes

Table D

*Goodness-of-Fit Test Statistics for LCA Models with Sexual Crime Characteristics Plus
Logit Items, 1 − 5 Classes.*

No. Classes	1	2	3	4	5
G^2	1457.01	1190.82	1059.93	1007.18	965.45
Df	4083	4070	4057	4044	4031
AIC	1481.01	1240.82	1135.93	1109.18[a]	1093.45
BIC	1533.09	1349.33	1300.87[a]	1330.54	1371.23
ABIC	1495.00	1269.97	1180.24	1168.64	1168.06[a]
BLRT	n/a	0.01	0.01	0.01	0.01

Note. G^2 = likelihood ratio statistic; *df* = degrees of freedom; AIC = Akaike Information
Criterion; BIC = Bayesian Information Criterion; ABIC = Adjusted Bayesian Information
Criterion; BLRT = Bootstrap likelihood ratio tests
[a]Best-fitting model according to that index.

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