

Criminal Trajectories of Adult-Onset Sex Offenders

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Abstract

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Abstract: Previous research has suggested that a subset of adult-onset sexual offenders (AOSOs) may be at an increased risk for re-offending against children. Despite this evidence, research on the trajectories of AOSOs is limited. The present study examines the offending trajectories of 520 AOSOs who were assessed at an out-patient mental health facility between 1995 and 2006. Four groups were identified in the sample using group-based trajectory modeling and were compared on the presence of three indicators of a sexual interest in children, victim characteristics, and a variety of additional criminal career parameters. A group with an escalating pattern of offending with onset in early adulthood was found to be associated with all three indicators of a sexual interest in children, and a high frequency of sexual offending. The three additional groups, as well as implications for policy, treatment, and future research are discussed.

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Introduction

Although the criminal career is now a fundamental feature to the study of crime, the concept has not always enjoyed such standing in the field. While nascent versions of the concept emerged in the early 1800s, the formal description of the criminal career is often attributed to the early work of Eleanor and Sheldon Glueck (1930; 1956; Quetelet, [1831] 1984). Although the Gluecks' research served as an important antecedent to many current lines of criminological research, outspoken critics such as Sutherland shifted the focus of criminology away from the longitudinal study of individual-level explanations of crime and directed it towards the study of socioenvironmental factors of individuals in high school (Laub & Sampson, 1991). This shift of focus persisted for much of the 20th century, resulting in the sweeping neglect of the development of crime outside of the adolescent period.

In 1986, on behalf of the National Institute of Justice, the Panel of Research on Criminal Careers published a two-volume report of their findings (Blumstein et al., 1986). The report defined a criminal career as “the characterisation of the longitudinal sequence of crimes committed by an individual offender” (Blumstein et al., 1986, p. 12). The report was commissioned when it became clear that approximately 10% of individuals were responsible for a disproportionate percentage of all crime committed. Naturally, the National Institute of Justice wanted to know if it was possible to predict whether an individual's offending was likely to become a chronic issue. While the report was not the only contributor to the resurgence of criminal career research (Sullivan & Piquero, 2016), the concept proceeded to flourish throughout criminology following the submission of the report.

The Blumstein report (1986) highlighted important components of the criminal career including the individual frequency of offending, duration of the offending period, age of onset and termination, and the severity of offences committed. The report also contained rudimentary work toward the identification of individual risk factors including substance use, early-onset offending, and low socioeconomic status. Although the report helped guide criminology back towards the longitudinal study of crime, it also highlighted the transition from adolescence to adulthood as an important time in criminal development (Blumstein et al., 1986). Blumstein described that most offenders will “age out” of criminal behaviour upon entering early adulthood. The report showed that the prevalence of offending showed a sharp increase in adolescence, which then rapidly diminished as the population reached adulthood.

The report, among other works, kicked off decades of research which focused on this critical period of adolescent criminal development and termination (Sullivan & Piquero, 2016). The focus of the present thesis is to gain a better understanding of the criminal careers of those who begin offending *after* the transition into adulthood, a group which has been referred to by previous researchers as adult-onset offenders or “late bloomers” (Gibson & Krohn, 2013; McGee & Farrington, 2010; McGee & Farrington, 2019). Those who begin their criminal career in adulthood and begin sexually offending are of particular interest, as they may be more likely to have a sexual interest in children, which in turn increases their likelihood of sexual reoffending (Francis et al., 2014; Mann et al., 2010). Interestingly, early life characteristics that may explain a delayed offending onset (e.g., social difficulties, lower IQ, etc.) are also the same factors described in the early lives of those with a sexual interest in children (Beckley et al., 2016; Thornberry, 2010) This group has also largely been ignored in the literature. As childhood sexual

abuse has been shown to have extensive and long-term deleterious effects on victims, it is important to gain understanding of the offending behaviour of this group (Murray et al., 2014). Therefore, my thesis focuses on two objectives. First, I examine the trajectories of adult-onset criminal career patterns among those who have committed a sexual offence. Second, I examine whether indicators of a sexual interest in children are associated with specific adult-onset criminal career patterns. Prior to a review of my study hypotheses, I provide a relevant literature review with a focus on previous trajectory research.

Developmental and Life-Course Criminology

Developmental and life-course theories of criminology emerged following the submission of the Blumstein report, establishing an important theoretical framework for all proceeding criminal career research. Broadly speaking, the developmental criminology approach focuses on identifying risk factors which predict the onset, maintenance, and desistance of offending; in particular, factors which arise in childhood and early adolescence (Day & Weisner, 2019; Le Blanc & Loeber, 1998). Life-course theories apply more emphasis on the social systems an individual is immersed in, and how changes to these social systems may aggravate or precipitate offending throughout the lifespan (Day & Wiesner, 2019; Sampson & Laub, 1993). While the theoretical backgrounds of developmental and life-course criminology are distinct, both share a focus on how patterns of offending develop across the lifespan. Most importantly, the two approaches both emphasize the longitudinal study of within-individual changes in offending, rather than changes in offending within the population. The paradigm shift brought on by developmental and life-course criminology and catalyzed by Blumstein's report essentially laid the groundwork for nearly all future research in the criminological

field. As Cullen states in his lament to the death of adolescent-limited criminology “life-course criminology *is* criminology” (Cullen, 2011, p. 310).

Moffitt’s Dual Taxonomy of Adolescent Offending

In the years proceeding Blumstein’s report, Moffitt sought to clarify the cause of the shape of the age-crime curve (Moffitt, 1993). Specifically, Moffitt was interested in explaining why the rate of offending was so much higher in adolescence than in adulthood. At the time, there were two possible hypotheses to explain this phenomenon: that a small subset of chronic offenders commit even more crime in adolescence than they do in adulthood (Hirschi & Gottfredson, 1983); or that there are simply more people who offend in adolescence (Nagin et al., 1995). Building from research at the time, Moffitt presented a dual taxonomy of offending in adolescence, a theory which would later become prominent in criminal trajectory research.

Moffitt theorized that there were two typologies of offender: Adolescent-limited offenders, and life-course persistent offenders (Moffitt, 1993, 2018). Adolescent-limited offending is characterized by a sharp increase in offending behaviour in adolescence, which then quickly decreases as people transition to adulthood (20-25). Moffitt (1993, 2018) posited that adolescent-limited offending is the result of adolescents falling into the “maturity gap” brought about by the widening gap between biological and social maturity. Upon reaching biological maturity, adolescents begin to have the urge to engage in “adult” behaviours or roles. However, societal limitations (e.g., minimum-age labour laws, license restrictions) make it difficult for them to engage in these roles (Moffitt, 1993). The theory also states that those who fall into the maturity gap are prone to emulating delinquent role models, as engaging in antisocial behaviour allows them to fulfill their need for personal agency (Moffitt, 1993, 2018). Theoretically relevant to the

maturity gap is Arnett's conception of emerging adulthood. Emerging adulthood is a theorized period of development which has materialized in the modern age, in which young adults are increasingly delayed in adopting "adult" roles in life (Arnett, 2000; Gilmore, 2019). The phenomenon of emerging adulthood may increase the size of the age maturity gap theorized by Moffitt and thereby increase the span of time in which adolescent limited offending could occur (Moffitt, 1993, 2018; Sivertsson, 2018).

In contrast to adolescent-limited offending, life-course persistent offending is characterized by an early onset of offending behaviours, which persists late into adulthood (Moffitt, 1993, 2018). Life-course persistent offenders are a relatively small subset of the offending population, somewhere between 5-10% (Jolliffe, et al., 2017). Life-course persistent offenders often exhibit conduct problems early in their development, exhibit higher levels of neuropsychological issues, and have weak family bonds. This group may also experience child maltreatment, poverty, and difficulties socializing (Moffitt, 2018; Nagin et al., 1995). These issues snowball as the individual develops and manifest in increased levels of substance use, violent behaviour, and chronic criminal behaviour (Moffitt, 1993, 2018). On the other hand, adolescent limited offending is so common that it is a borderline normative behaviour, which typically desists between the ages of 20-29. Adolescent-limited offenders rarely present the same risk factors as life-course persistent offenders, and also have more success in middle-age when compared to life-course persistent offenders (Moffitt, 2018; Nagin et al., 1995). Interestingly, at the peak age of offending, adolescent-limited and life-course persistent offenders are nearly indistinguishable in terms of the nature of offences that they commit, and the frequency of their offending (Moffitt, 2018). Although Moffitt's theory was

important to the early understanding of patterns of offending, research has demonstrated that offending is better explained by more than two offending groups (Piquero, 2008).

Trajectory Research

Developmental and life-course approaches gained further traction through the 1990s as researchers began to examine trajectories of offending. The original Nagin and Land (1993) study analyzed data from a cohort of 411 boys from London, following them from age eight through age 32. The study identified three separate trajectories:

Adolescent-Limited offenders, Low-rate Chronic offenders, and High-rate Chronic offenders. Nagin and Land described Adolescent-Limited offenders as typically desisting from offending as they transitioned into adulthood and characterized them as exhibiting low peer popularity and low school performance. Low-rate Chronics continued offending well into adulthood, though at a slower rate than the High-rate Chronics, exhibiting higher rates of low IQ than the other groups as well as lower rates of violence than the High-rate Chronics. The High-rate Chronics maintained a high rate of offending through adulthood and exhibited a great number of risk factors including substance use, job instability, and difficult temperaments.

A Developmental and Life-Course Approach to Juvenile Sex Offenders

The above examples have primarily focused on the criminal trajectories of those who engage in offending, regardless of offence type. There has been less focus on the trajectories of individuals who commit specific offences. Although the focus of this thesis is on sexual offenders who begin offending in adulthood, the majority of trajectory research on sexual offenders has focused on offending which begins in adolescence (juvenile sex offenders; JSOs; Francis, et al., 2014; Lussier & Blokland, 2014; McCuish

& Lussier, 2017; McCuish, et al., 2016; Piquero, et al., 2012; Reale, et al., 2019). A brief review of this research is necessary as it will inform the trajectories that I expect to find.

To understand why such a concerted effort has been made to research the trajectories of those who sexually offend in adolescence, one must consider prevailing fears regarding the group. Perhaps understandably, the general public harbours fear towards the risk that JSOs, may pose to the community (Lussier, 2017). Studies on the public perception of JSOs have demonstrated that it is common for people to endorse more punitive measures, including lifetime labeling through registries, putting out community warnings, geographic restrictions for JSOs, endorsing that JSOs be sentenced the same as adult sexual offenders, and to label JSOs as “super predators” (i.e., cold, dangerous, likely to reoffend; Campregher & Jeglic, 2016; Stevenson, et al., 2015). These perceptions have created the idea that today’s JSOs are tomorrow’s adult sexual offenders, that JSOs will specialize in sexual offending, and that their behaviour will persist into adulthood (Lussier, 2017; Lussier & Blokland, 2014; Reale et al., 2019; Zimring, 2004).

An Overview of Trajectories Found in JSO Research

Despite the growing popularity and prevalence of trajectory research, the study of juvenile sexual offending using this method has a brief history. In summary, trajectory research on JSOs has found a few common trajectories across studies (for a more in-depth review of individual findings see Table 1). Typically, there is a group which has a low rate of offending over the study period (mainly consisting of one-time offenders); a group which behaves similarly to Moffitt’s adolescent-limited offender; a group whose offending begins to pick up toward the end of adolescence; and a group whose offending begins early and remains high over the data collection period (Lussier et al., 2012;

McCuish et al., 2016; Reale et al., 2019). Although certain trends are commonly found, slight differences may exist based on variations in the study population, differences in choice of labeling, and differences in the number of groups chosen to describe the model.

Another common finding across various studies on the trajectories of JSOs is that contrary to implemented policy, research does not support the fear that untreated JSOs will continue sexually offending for the rest of their life (e.g., Lussier & Blokland, 2014; McCuish et al., 2016; Piquero et al., 2012; Reale et al., 2019). For example, Reale and colleagues (2019) found that the presence of a sexual offence in adolescence (ages 12-17) did not predict the presence of a sexual offence in adulthood (ages 18-25). The study also found that a juvenile sexual offence was not associated with any particular offending trajectory in adulthood, and that JSO's were no more likely to sexually reoffend than the average juvenile non-sexual offender (Reale, et al., 2019). Using the same sample, McCuish et al. (2016) determined that JSOs were equally distributed across the four trajectories that they identified. It was also found that the best predictor of sexual offending continuity from adolescence to adulthood was a pervasive pattern of accompanying non-sexual offending (Reale et al., 2019). These findings have been echoed by similar studies including one which analyzed over 87,000 members of the 1984 Dutch Birth Cohort (Lussier & Blokland, 2014). The study found that only 3% of JSOs sexually reoffended in adulthood, and that only 4.5% of adult sexual offenders had sexually offended as a juvenile (Lussier & Blokland, 2014). Therefore, with the exception of a small group of chronic adolescent offenders commonly found in trajectory research (Cale et al., 2016; Lussier et al., 2012; McCuish et al., 2016; Reale et al., 2019), there is strong evidence that today's JSOs are rarely tomorrow's adult sexual offenders, and that

the two groups should be considered distinct (Lussier & Blokland, 2014; Piquero et al., 2012; Reale et al., 2019).

Adult-Onset Offending

Although the developmental and life-course frameworks have been thoroughly used over the past three decades and have been extended to JSOs, the overarching focus has been on offending that starts in adolescence. This adolescence-limited focus has eclipsed the study of offending that begins in other developmental stages, including adulthood. Despite the general body of research showing that JSOs are not destined to become adult offenders (Cale et al., 2016; Lussier et al., 2012, 2012; McCuish et al., 2016; Reale et al., 2019), there is a lack of research on the criminal trajectories of adult-onset sex offenders. Further it has been demonstrated by aggregate crime rates that sexual offending peaks in adolescence and again in the mid to late 30s (Canadian Centre for Justice Statistics, 1999). Hanson (2002) identified a similar pattern in an analysis of 4,673 international sex offenders and found that both the peak age of offending and patterns of recidivism varied by offender type. It was found that the average age of those who offended against unrelated child victims was 37.1 years old and that this group also had the highest recidivism rate (19.5%) compared with all other sex offenders in the sample (Hanson, 2002). Given that the peak of sexual offending occurred later in adulthood, it is possible that studies focusing on adolescence and early adulthood may not capture the full extent of sexual offending in an individual's life; this is especially true of those who begin sexually offending in adulthood. Although there is a lack of research on this group, there are a few competing theories which seek to explain adult-onset offending (AOs), which are highlighted below.

Moffitt's Theory of Adult-Onset Offending

AO offending refers to an individual whose offending begins after the transition into adulthood, although the exact nature of this group is a matter of debate. Although AO offenders are commonly identified in the literature, it is difficult to paint an accurate picture of their prevalence and characteristics due to differences in study populations and how the concept of “adult-onset” is operationalized across studies. In some studies, AO offending is described as an onset of offending after legal adulthood (e.g., 18 Lussier & Blokland, 2014; Sapouna, 2017), whereas others operationalize AO offending as occurring later in life to account for theories of emerging adulthood (e.g., 25, Beckley et al., 2016; Sivertsson, 2018). Despite differences between studies, being convicted of a crime for the first time in adulthood is not a rare occurrence.

One perspective endorsed by Moffitt is that true AO offenders do not exist. Moffitt insists that closer inspection of any AO offenders will reveal a longstanding pattern of offending, similar to that of the life-course persistent offenders, that went unnoticed by law enforcement until adulthood (Moffitt, 2018). This theory is supported by the fact that relying on official records of offending often underestimates actual rates of offending (Beckley et al., 2016; McGee & Farrington, 2010), and that when considering self-reported offending there are more commonalities than differences in the offending behaviour of early-onset offenders and AO offenders (Sapouna, 2017). For example, Beckley and colleagues (2016) found that in their sample of 484 men from the Dunedin longitudinal study, about 14% of the sample had their first official conviction at 20 years or older. However, they found that the identified AO offenders were also more likely to meet criteria for conduct disorder as adolescents than non-offending adults, suggesting the presence of antisocial behaviour. Further, 24% of AO offenders had

significant contact with the police in adolescence that did not result in a criminal conviction.

Another study looking at self-reported delinquent behaviour found that about a third of their AO offenders reported significant levels of juvenile offending (McGee & Farrington, 2010). Using a sample from the Cambridge Study in Delinquent Development, McGee and Farrington (2010) found two patterns of AO offending, one characterized by low levels of self-reported offending through adolescence with an increase in offending behaviour in adulthood, and another characterized by high levels of offending through adolescence that was undetected until adulthood. It is argued that AO offenders are likely to have escaped detection because of the types of offences they committed (e.g., sexual offences, vandalism, theft from work, fraud). Apart from sexual offending, the most common types of offences committed by AO offenders were those that could be committed without a dramatic noticeable effect.

Other Developmental and Life-Course Theories of AO Offending

While Moffitt believes that AO offenders are an artifact of undetected adolescent offending, other developmental and life-course theories of offending maintain that the onset of offending can be influenced by a complex system of social, economic, genetic, and developmental factors (Le Blanc & Loeber, 1998; McGee & Farrington, 2019; Thornberry, 2010). In contrast to the assertion that AO offending does not exist, other theories typically allow for the existence of true AO offenders by recognizing that situational factors and individual motivations for offending will change across the lifespan. They also recognize that long-term individual differences in factors like temperament, impulsiveness, and resilience to strain will inform how an individual will respond to changing life circumstances (McGee & Farrington, 2019; Thornberry, 2010).

For example, Thornberry's Interactional Theory (2010) states that AO offenders will be more likely to have personal deficits like a lower childhood IQ but also more likely to have supportive family, school, and social factors which protect them from offending in adolescence (Farrington, 2005; Thornberry, 1987). As these individuals grow older, these protective factors diminish, which leaves them vulnerable to the pressures of life, increasing their risk of engaging in antisocial behaviour (Gibson & Krohn, 2013; Thornberry, 2010). Additionally, Sampson and Laub's (1993) age graded informal social control theory focuses on an individual's social bonds with influences like family, peers, and societal institutions. The theory states that as these social bonds weaken, individuals will be more likely to engage in criminal behaviour, and likewise, as these bonds strengthen, they will be more likely to desist.

Sapouna (2017) found that AO offenders were more likely to report enjoying school and less likely to report skipping school than those who began offending in adolescence, suggesting that school engagement may serve as an important protective factor. Zara and Farrington (2013) found support for the idea that internalizing factors (those which cause an individual to withdraw into themselves) are correlated with adult-onset offending, suggesting that a lack of peer engagement in adolescence might serve as a protective factor against offending in childhood, but may aggravate criminal tendencies later in life.

Empirical Evidence for Adult-Onset Offenders

It is clear that AO offenders exist and are consistently detected in longitudinal studies (Beckley et al., 2016; Eggleston & Laub, 2002; Lussier & Blokland, 2014; Sapouna, 2017; Sivertsson, 2018). In an early review of criminal career literature it was found that on average, 50% of offender samples had offended for the first time after the

age of 18 (Eggleston & Laub, 2002). In a more recent example, Sivertsson (2018) analyzed criminal conviction data from age 15 to 50 for the entire population of Sweden born between 1960 and 1964 ($n = 554,996$). They found that 22% of males and 38% of females in the sample offended for the first time after the age of 25. In another study which analyzed data from the Offending, Crime, and Justice survey (distributed in England and Wales between 2003 and 2006; $n = 779$), approximately 16% of the sample reported offending for the first time after the age of 18 (Sapouna, 2017). The researchers also found that later negative life events were associated with the onset of AO offending, supporting the theory that changing life circumstances can cause an otherwise non-offending adult to begin offending. AO offenders were also found to make up 21.8% ($n = 3,993$) of those who offended during adulthood in the Dutch Birth Cohort Study ($n = 18,321$; Lussier & Blokland, 2014); 7.9% ($n = 78$) of offenders in a subset of the National Collaborative Perinatal Project ($n = 987$; Gomez-Smith & Piquero, 2005), and ranged from 9-87% of the samples examined in Beckley et al.'s (2016) review of trajectory research.

Adult-Onset Sexual Offending

If little is known about AO offending, then even less is known about adult-onset sexual offending (AOSO). Sivertsson (2018) found that 36.8% of the sexual offences in the sample were committed by people offending for the first time after the age of 25, and that 64.2% of sexual offences were committed after the age of 18. Similarly, McGee and Farrington (2010) found that sexual offences were one of the most common crimes committed by AO offenders in their sample, and that they were responsible for nearly half (46.2%) of the sexual offences recorded in the sample. A study by Lussier and Blokland (2014) found that of 377 individuals who had committed a sexual offence in adulthood,

only 29.4% of them had committed any offence as a juvenile. The same study also found evidence that many adult-onset sex offenders (AOSOs) did not recidivate, and that their sexual offences could be representative of difficulties in the transition from adolescence to adulthood, such as living alone for the first time or difficulties finding employment (Lussier & Blokland, 2014).

Studies which use trajectory research to specifically study AOSOs are rare; however, two studies which touch on their existence illuminate important aspects of this population¹. The first study examined the criminal trajectories of males ($n = 250$) who committed a sexual offence and served at least two years in a federal correctional institution in the province of Quebec from April 1994 and June 2000 and identified four offending trajectories (Lussier et al., 2010). To account for the potential of “hidden” adolescent offending, the study accounted for self-reported adolescent offending, as well as offending based on official records. Although the sample did not consist solely of those who began offending as adults, two trajectories were identified in which offending emerged in adulthood: very low-rate offenders and the late bloomers. These two groups of offenders were the least criminally versatile offenders in the sample and were most likely to specialize in sexual offending. The very low-rate offenders had an average onset of offending in their mid-40s, committed 56% of all sexual offences, and had limited criminal involvement outside of sexually offending. Late bloomer’s offending began in adulthood and gradually increased until their mid-30s when their offending met the level

¹ It is important to note that the offence histories of those involved in Lussier et al. (2010) and Francis et al. (2014) were analyzed retrospectively, which can affect the ability to accurately describe the criminal careers of those studied. Refer to Discussion section for further elaboration.

of the identified high-rate chronic group. The onset of the Late bloomer's sexual offending typically coincided with the peak of offending in the mid-30s.

Another study also identified two individual trajectories of AOSOs in their sample (Francis et al., 2014). The sample consisted of 489 men referred to the Massachusetts Treatment Center (MTC) for a sexual offence from 1959-1984, and the median age of the sample was 27 years old. When specifically analyzing the trajectories of sexual offenders in the sample they identified two trajectories which appeared to begin in adulthood, similar to those found in Lussier et al.'s 2010 study. The first late onset group was named the high-rate accelerator group who began sexually offending in their mid 20s ($M = 25.2$) which rapidly escalated and peaked in their late 40s. The second late onset group was labeled the late-onset accelerators whose offending began in their late 20s ($M = 27.8$) and escalated until their late 50s. The late-onset accelerators were most likely to offend against children. Overall, the majority of individuals placed in these two late onset groups had sexually offended against children (Francis et al., 2014).

Present Study

There is an absence of studies which have specifically analyzed the offending trajectories of AOSOs. It is important to gain a better understanding of the offending characteristics of AOSOs as previous studies show that a significant number of AOSO's offending escalates throughout much of their life, and that certain types of AOSOs may be more likely to persistently offend against children (Francis et al., 2014; Lussier et al., 2010). This is important as the presence of multiple child victims has been identified as an indicator of a sexual interest in children (Seto et al., 2017), which is a risk factor for future sexual offending (Mann et al., 2010). Notably, none of the previously described studies have explicitly looked at whether certain AOSOs are more likely to have a sexual

interest in children. It could be that AOSOs are only gaining access to children later in life as they find themselves in roles of responsibility over children (e.g., via employment, family) compared with adolescents which may delay their offending onset. This is also supported by an increase in offending against children found in middle age (Government of Canada, 2013; Statistics Canada, 1999). Notably, the early life characteristics which explain why individuals begin offending in adulthood (social difficulties, lower IQ, anxiety, etc.) are similar to characteristics which have been used to describe the early lives of those with a sexual interest in children, such as social difficulties, anxiety, and lower IQ (Beckley et al., 2016; Thornberry, 2010). It is conceivable that similar influences which delay general offending until adulthood may also delay the offending of those with a sexual interest in children.

The purpose of the present thesis was to identify and analyze the criminal trajectories of AOSOs and to predict trajectory group membership based on different indicators of sexual interest in children (e.g., self-report, psychophysiological measures). For study purposes, AOSOs are defined as any individual who was not offending sexually or non-sexually prior to age 18, and then began offending either sexually or non-sexually (which later led to the commission of a sexual offence) in adulthood. Limitations to this inclusion criteria will be discussed further (see Limitations section). The first hypothesis was that criminal trajectories found in the present study would be similar to those found in previous studies which identified AOSOs (Francis et al., 2014; Lussier et al., 2010). More specifically, it was expected that there would be four trajectories: 1) The first trajectory would consist of those who very rarely offend, or are one-time offenders (Rare/One-time group), 2) the second trajectory would be characterized by a higher frequency of offending at the outset (age 18) with desistance around age 25 at the end of

emerging adulthood (Emergent Adulthood group), 3) a third trajectory whose offending would begin shortly after emergent adulthood (25) and then rapidly escalate through their life (Early Escalator group, 4) and a final trajectory whose offending would begin even later in adulthood (35+) before continuing to escalate over the life course (Late Escalator group). After trajectory analyses were completed, exploratory analyses were conducted to describe and compare the identified trajectory groups on several criminal career parameters which are commonly studied in criminal career research. For further description of the identified trajectories, the proportion of those in each group who offended against the victim types of interest were also identified. Together the analyses of criminal career parameters and victim characteristics were necessary to better describe and contextualize the identified trajectories.

The following hypotheses were concerned with characteristics of the identified trajectory groups with a focus on sexual interest in children. The second hypothesis was that the Early Escalator group and the Late Escalator group would be most likely to commit offences against children than the other groups. Following from this hypothesis, the third hypothesis was that those in the two Escalator groups would be most likely to have a sexual interest in children. Two additional hypotheses were tested for the remaining groups based on existing AOSO trajectory research. The fourth hypothesis was that membership to the Rare/One-time group would be associated with having incest victims. The fourth hypothesis followed findings from Francis et al.'s (2014) study that the highest number of incest offenders were found in their low-rate group. Logically this makes sense as incest offenders typically have the lowest recidivism rates among those who offend against children (Harris & Hanson, 2004). The fifth and final hypothesis concerned the Emergent Adulthood group and stated that those in this group would be

most likely to have adult female victims. This prediction also followed findings from Francis et al. (2014) who found that those who committed rape tended to be younger offenders.

Method

Sample

The present study used an archival dataset which consisted of 747 men who were charged with at least one sexual offence and were assessed at the Centre for Addiction and Mental Health (CAMH) in Toronto, Ontario between 1995 and 2006. Following the legal age of adulthood in Canada, those whose first offence of any kind occurred before 18 and those who self-reported committing a sexual offence prior to 18 were excluded from analysis, leaving 520 men in total (see Limitations for further discussion of exclusions). Although those whose offending onset in adolescence could act as a comparison group for those which began in adulthood, the purpose of this study was to better understand how a sexual interest in children is expressed in AOSOs. Further, those being assessed at CAMH with an existing juvenile offending history demonstrate a continuity of offending into adulthood and would likely present a higher risk for offending than the typical adolescent offender making them an unsuitable comparison group for AOSOs.

Most men (75.8%, $n = 389$) in the sample were Caucasian, followed by 7.1% ($n = 37$) who were African Canadian. The rest of the group was relatively evenly split between East Indian/Pakistani (4.8%, $n = 25$), Indigenous (1.7%, $n = 9$), Filipino/Pacific Islander (2.3%, $n = 12$), Asian (2.1%, $n = 11$), or those who indicated Other for ethnicity (5.6%, $n = 29$). The average age of the offenders at the time of assessment was 42 years old ($M = 42.69$, $SD = 12.09$) and 56.2% had at least a Grade 12 education; 87.5% ($n = 455$) of the

sample had at least a Grade 9 education. About half (49.8, $n = 259$) of the participants were referred to CAMH as a condition of probation or parole. The rest of the men were referred by a correctional institution (26.5%, $n = 138$), their lawyer (19.6%, $n = 102$), self-referred (1.2%, $n = 6$) or were directed by legal aid (0.6%, $n = 3$).

The average age at the time of first reported known sexual offence was 34 years old ($M = 34.18$ $SD = 11.54$). At the time of the assessment, every participant in the sample had been charged with at least one sexual offence, and the majority (84.8%, $n = 441$) of participants had sexually offended against a child in adulthood. A little less than half (49.0%, $n = 255$) of participants had only one victim at the time they were assessed at CAMH. It is important to note the average age at first known sexual offence and the victim information was based on the information known at the time of the CAMH assessment.

Measures and Procedure

The current archival study used a dataset which was previously coded by the supervising researcher, Dr. Skye Stephens and a trained research assistant. The data was originally coded for Dr. Stephens' dissertation, which focused on recidivism and has been included in three published studies that examined unique research questions (i.e., Stephens et al., 2017; Stephens, Newman, et al., 2018; Stephens, Seto, et al., 2018). A detailed manual used to code the recidivism data was developed by Dr. Stephens and Dr. Michael Seto (thesis committee member). Interrater reliability was calculated on 10% of the cases using intraclass correlations (ICC), and it was found that ICC values were above .90, except for violent recidivism which was .75 (Stephens, Seto, et al., 2018).

After the recidivism data was coded for the purposes of Dr. Stephens' dissertation, both Dr. Stephens and a research assistant went back to the criminal records to code the

records in their entirety with the intention to examine criminal trajectories in the CAMH dataset. A coding manual was created to guide this process. To date no research has been conducted examining criminal trajectories via the dataset.

Criminal Offending

The entire official offending records of participants in the dataset were obtained from the Canadian Police Information Centre (CPIC) of the Royal Canadian Mounted Police. The index offence, or the offence which resulted in the assessment at CAMH, was coded as either a contact sexual, non-contact sexual, serious violent, other violent, weapons, breach, property, or other non-violent offence. Both charges and convictions were collected for use in this study. The length of sentence (in months) incurred because of the offence was also collected to later account for exposure time. Any offences which occurred before the index offence were coded as prior offences, and any offences occurring after the index offence were coded as a reoffences (recidivism). Offences which occurred between the index offence and the date of assessment at CAMH were coded as “ambiguous” offences. Priors, instances of reoffending, and the ambiguous offences were coded in the same manner as the index offences. All offences captured in the dataset occurred between July 1953 and November 2012. For the present thesis, criminal record data for each case were recoded so that offences were listed in chronological order from the first official offence to the last offence to allow for trajectory analyses.

Criminal Career Parameters

To describe and compare the identified trajectories, several criminal career parameters were calculated using information obtained from CPIC records. The parameters included in the thesis were as follows: age at which the individual was charged for their first offence, regardless of offence type; the age at which the individual

committed their first sexual offence (based on both self-report and CPIC records); the total accumulated charges from age 18 to 60 (lifetime total charges); the total number of sexual offence charges from ages 18 to 60; the total number of non-sexual offence charges from ages 18 to 60; the number of unique interactions (charges or convictions) with the criminal justice system from ages 18 to 60; the total time in months spent in custody over the study period; and the total length of each person's criminal career in months.

Sexual Interest in Children

Three variables were used to assess the presence of a sexual interest in children. The first indicator of sexual interest in children was based on phallometry. Phallometric testing measures sexual arousal via changes in penile blood volume during the presentation of sexual stimuli (Blanchard et al., 2001). The sexual stimuli at CAMH were audio and visual material that consisted of males and females at various stages of sexual development (prepubescent, pubescent, and fully mature adults). Participants were also shown a neutral condition consisting of landscape scenery. The presented audio stimuli consisted of short sexually explicit narratives related to the character being visually depicted; neutral audio narratives were also presented during neutral visual scenes. Phallometric assessment produces a pedohebephilic index score which is obtained by subtracting their ipsatized average response to adults from the greater ipsatized average response to either prepubescent or pubescent children. In clinical practice, a conservative index score threshold of $z \Rightarrow 0.25$ (indicating a substantially greater response to children over adults) is typically required to identify someone as having a sexual interest in children (Blanchard et al., 2001). For the purpose of this study, a threshold of $z \Rightarrow 0.00$ was required to meet the criteria for a sexual interest in children; a practice which has

been established in the research literature to increase the sensitivity of the phallometric test (Cantor & McPhail, 2015; Stephens et al., 2019). The accuracy of phallometric assessment is measured via sensitivity (percentage of correctly identified men with a sexual attraction to children) and specificity (percentage of correctly identified men with no sexual attraction to children). The sensitivity and specificity of the phallometric process at CAMH is 70.0% and 90.7% for hebephilia and 71.9% and 95.5% for pedophilia (Cantor & McPhail, 2015).

The second indicator of sexual interest in children was retrieved through self-report as part of a sexual history interview conducted at CAMH. During the sexual history interview participants were asked to rank the ages of males and females by their preferred age of attraction (0-5, 6-10, 11, 12-14, 15-16, 17+), each age range was ranked on a scale of one (strongest sexual interest) to five (least sexual interest). In the present study, having ranked any age below the age of 15 as the third choice or higher was used as an indicator of a sexual interest in children. It has been shown that self-reported sexual attraction and sexual fantasies towards children are associated with increased numbers of child victims (Woodworth et al., 2013).

The final indicator of sexual interest in children was scores on the Screening Scale for Pedophilic Interests Revised (SSPI-2). The original SSPI was developed as a brief four-item screening measure for pedophilic interests when access to detailed records, interviews, or more stringent measures such as a phallometric test were unavailable (Seto & Lalumière, 2001). The four items on the original scale are: 1) Offender has a boy victim (weighted by two), 2) Offender has more than one child victim, 3) Offender has victim aged 11 or younger, and 4) Offender has an unrelated child victim. The recently created SSPI-2 is scored similarly to the original SSPI, though with the addition of a fifth

item (i.e., admission or charged with possession, distribution, or production of child pornography) and the removal of additional weighting on the “boy victim” item (Seto et al., 2017). Each item on the scale was scored in a binary fashion with total scores ranging from zero to five. The addition of the fifth item was shown to increase classification accuracy over the original SSPI and was strongly positively correlated with pedohebephilia index scores derived from phallometric assessment (Seto et al., 2017). Recently, it has been suggested that scores on the SSPI-2 may be better described as an indicator of pedohebephilia, rather than exclusive pedophilia (Stephens et al., 2019). The SSPI-2 was scored from information obtained from official records of the participants victims which was received by the clinician as part of the assessment at CAMH, as well as self-reported information retrieved during a sexual history interview.

It is important to note that scoring the SSPI-2 relies on two important pieces of information: 1) the presence of sexual offending, and 2) key victim characteristics. The reliance on these two pieces of information introduces an important consideration when applying the SSPI-2 to the current sample. Each offender’s victim information was only retrieved once at the time of the CAMH assessment. Therefore, we do not have the victim information for sexual offences which may have occurred after the CAMH assessment or sexual offences that were not detected or disclosed. It is possible that if this information were available, some offender’s scores on the SSPI-2 would be different than those used in this study. This limitation also applies to the other victim characteristics used in the study, which are discussed below. As a result of this issue, the pedohebephilic index scores and self-reported sexual interest were the primary indicators of sexual interest in children in the present study; however, the SSPI-2 was included for completeness.

Although phallometry and self-report were also only measured at the time of the CAMH

assessment, sexual interest in children as reflected is likely to remain stable over an individual's lifespan (Grundmann et al., 2016; Seto, 2012).

Victim Information

Victim information was collected based on a review of file information and self-reported victim information which were retrieved at the time of the CAMH assessment. In cases of a discrepancy between these two sources, the source which resulted in the highest number of victims was used. Although the information was initially coded as count data, for this study each victim type variable was binary coded (0 = did not offend against victim type of interest, 1 = offended against victim type of interest). There are three distinct victim types which were analyzed in the current study: having child victims (any victims below the age of 15); incest offenders (any victims who were related to the perpetrator); and adult female victims (any female victims over the age of 17).

Data Analysis

Dataset Preparation. Group-based trajectory modeling (GBTM) was conducted to identify offending trajectories in the dataset; however, significant data preparation was required before analysis. Using the original criminal careers dataset, a chronological offence history was created for each offender (prior to this, offences were arranged in relation their assessment at CAMH, and not necessarily in order of offence date). For each offence captured by the dataset the following information was calculated: the age of the offender at the time they were convicted/charged for the offence, the number of charges/convictions that the offence incurred, the number of months they spent in custody because of the offence, as well as the percentage of a year that they spent outside of secure custody and in the community (time-at-risk).

Using this information, two additional datasets were created: one describing the number of charges/convictions that each offender received during each age-year of their life (criminal career), and one describing each offender's time-at-risk for each age-year of their life. Both the created criminal career dataset and the time-at-risk dataset began at age 18 and continued to age 81 (representing the oldest age captured in the dataset). For the main analyses, both datasets were capped at age 60 to balance the length of follow up with missing data (100% accounted for up to age 25, 97.7% accounted for from 26-30, 91.7% accounted for from 31-35, 84.2% accounted for from 36-40, 70.5% accounted for from 41-45, 55.7% accounted for from 46-50, 37.4% accounted for from 51-55, and 26.8% accounted for from 56-60; Reale et al., 2019; Sampson & Laub, 2003). Piquero's (2008) review of research using trajectory methods found that the number of identified groups remains relatively stable over a sample size of 200. As the sample size does not begin decreasing to a potentially problematic degree until the latest age brackets (when the majority of offenders have ceased their offending), this level of attrition is not considered as a significant threat to the stability of the identified trajectories. Finally, as the statistical package used to analyze the data is unable to work with time-at-risk values equal to zero (indicating having spent an entire age-year in custody), offenders were recorded as having spent ~10 days (0.0274% of year) in the community during such years, a practice which is common in trajectory research (Cale et al., 2016; McCuish et al., 2016; van der Geest et al., 2009).

Trajectory Analysis. GBTM is a non-parametric, nested, zero-inflated Poisson model that is used to identify unknown trajectories in a longitudinal dataset (Jennings & Meade, 2016). For the purpose of this study, GBTM was used to address the first hypothesis and identify and visualize underlying patterns of offending found in the data.

Both of the previously created datasets (criminal career and time-at-risk) were imported into R to be analyzed using *crimCV* version 0.9.6, a statistical package developed by Dr. Jason Nielson and uploaded to <https://cran.r-project.org/web/packages/crimCV/index.html> (Nielsen et al., 2014). The criminal career dataset served as the main file of analysis, while the time-at-risk data allows the program to correct for exposure time (i.e., someone offending three times in one year is comparatively less severe than someone offending three times in the only month that they were not incarcerated; Nagin, 2005). Factoring in exposure time also allowed for the distinction between true desistance and desistance due to incarceration (Nagin, 2005).

The model containing the optimal number of trajectories to describe the offending in the dataset was chosen using various inference criteria. The initial selection process factored in a balance of both the Bayesian Information Criteria (BIC) which is the standard method of model selection in trajectory modeling (Nagin, 2005) and the Cross-Validation Error (CVE) which is suggested by the authors of the *crimCV* package (Nielsen et al., 2014). The goal of both selection methods is to choose the model which produces the smallest value in the metric. The selected model was also required to display posterior probabilities (PP) of 0.70 or greater, odds of correct classification values of 5 or greater, and could not contain trajectories which contained less than 5% of the sample (Nagin, 2005; Reale et al., 2019). It should be noted that trajectory analyses are not perfect in their group placement, and that each individual in the dataset has a probability of belonging to any one of the identified trajectories (Nagin, 2005). As such, the identified trajectories are not real in the sense that they are definite phenomenological occurrences. The utility of trajectory analyses is when they are used to build and inform theory and are not in themselves sufficient for declaring the existence of identified group.

Trajectory Criminal Career Parameters. To compare the identified trajectories, a series of one-way ANOVAs were used to clarify the trajectories on several criminal career parameters: age of first offence, the age of first sexual offence, total number of charges, total number of sexual offence charges, total number of non-sexual offence charges the number of unique court contacts, the total time spent in custody, and the length of criminal career. Levene's tests of homogeneity were conducted for all tests and variances were found to be unequal for every variable of interest. Therefore, Welch's ANOVAs were conducted for each analysis. Significant ANOVAs were followed by Games-Howell post hoc tests to clarify the differences between trajectory group means. These analyses were conducted to allow for description and comparison of the identified trajectories.

Multinomial logistic regression. To address the second, third, fourth, and fifth hypotheses, multinomial logistic regression were used to predict trajectory membership based on the three measures of sexual interest in children and victim information. Multinomial logistic regression was used as it allows you to predict a categorical outcome with more than two levels using multiple predictor variables. The analyses concerning the three measures of sexual interest in children were each conducted twice: first using the Early Escalator group as the reference category, and second using the Late Escalator group as reference. Each of the analyses looking at victim type were conducted once, using the hypothesized target group as the reference category.

Results

Trajectory Model Selection

Using the *crimCV* package in R, five trajectory models containing an iteratively increasing number of trajectories were conducted and model selection criteria was saved

(for summary of model selection data, see Table 2). All models were conducted using an initialization value of 20 (on recommendation of the package author; Nielsen et al., 2014). The overall likelihood equation relies on two predictor functions, one estimating the shape of each identified trajectory, and one estimating the amount of zero inflation (likelihood of non-offending at any given time). Each model was conducted using a cubic polynomial for each of the two predictor functions (i.e., cubic-cubic model). Although the CVE alone would suggest that a one-group or two-group model would best represent the data, the BIC continuously improved with added trajectories. In weighing the two inference criteria metrics against each other, it appears that a one or two group model would not be the most appropriate fit for the data. When considering the CVE of models with higher numbers of groups, the CVE improves from the three-group model to the four-group model but performs worse when moving from a four-group to a five-group model. Taken together, this suggests that a four-group model is most appropriate to represent the data. Further supporting a four-group model, a review of over 80 studies using trajectory modeling methodology found that three to five groups were most commonly identified in studies using offender samples (Piquero, 2008).

Following the choice of a four-group model, three additional models were tested to determine the optimal functional form of the likelihood equation (i.e. quadratic-quadratic, quadratic-cubic, cubic-quadratic; Nielsen et al., 2014). Note, unlike ProcTraj in Mplus, *crimCV* is unable to specify individual orders (cubic or quadratic) of trajectories in the model. Based on the optimal BIC value, the cubic-quadratic equation was chosen as the best four-group model (See Figure 1 for plotted trajectories). The odds of correct classification (OCC) and average posterior probabilities (PP) were calculated for the four trajectories as further evidence of model fit and are displayed in Table 3, along with

additional characteristics. OCC was calculated for the chosen model, all OCC values were greater than five, all average PP values were greater than 0.70, and no trajectory contained less than 5% of the sample.

The identified and plotted trajectories are found in Figure 1 and closely resemble the hypothesized trajectories. The first group identified, labelled the Early Escalator group (13.5% of sample) was characterized by a low rate of offending throughout the 20s followed by a rapid escalation of offending in the early-30s which peaked in the mid-40s and began to deescalate over the rest of the lifespan. The second group identified, labelled the Late Escalator group (16.0% of sample) followed a similar pattern to the Early Escalator group; however, they had a later onset and peak which occurred in the mid-40s and mid-60s, respectively. Additionally, the peak of offending was not as high as the peak found in the Early Escalator group. The third group identified, labelled the Low-Level Intermittent group (27.9% of the sample) was characterized by an uptick of offending at the outset of adulthood, which slowly desisted until becoming a pattern of sporadic offending throughout the lifespan. The Low-Level Intermittent offenders also experienced another uptick in offending behaviour in late adulthood. The fourth and final group identified, labelled the Low-Level Chronic group (42.7% of the sample) was characterized by a sporadic but consistent moderate rate of offending across the lifespan.

Trajectory Comparisons

A series of one-way analysis of variance (ANOVA) tests were conducted to compare the four identified trajectories on various criminal career parameters (See Table 4 for breakdown of mean values of criminal career parameters).

Age at First Official Offence

The Low-Level Intermittent offenders began offending significantly later than all other groups (Low-Level Intermittent > Late Escalator group, $p < .001$, $d = 1.29$ [95% CI 1.00, 1.58]; Low-Level Intermittent > Early Escalator group, $p < .001$, $d = 1.65$ [95% CI 1.33, 1.96]; Low-Level Intermittent > Low-Level Chronic, $p < .001$, $d = 1.79$ [95% CI 1.54, 2.03]). The offending onset of the remaining groups did not differ from each other with one exception: the Late Escalator group began offending significantly later than the Low-Level Chronic offenders (Late escalator > Low-Level Chronic, $p = .002$, $d = 0.49$ [95% CI 0.24, 0.75]).

Age at First Sexual Offence

The Early Escalator group showed a significantly earlier sexual offending onset than all the other identified groups (Early Escalator < Late Escalator, $p < .001$, $d = 0.74$ [95% CI 0.42, 1.06]; Early Escalator < Low-Level Intermittent, $p < .001$, $d = 1.46$ [95% CI 1.15, 1.76]; Early Escalator < Low-Level Chronic, $p < .001$, $d = 0.53$ [95% CI 0.26, 0.80]). Further, the Low-Level Intermittent group had a significantly later onset of sexual offending than all other groups (Low-Level Intermittent > Late Escalator, $p < .001$, $d = 0.72$ [95% CI 0.44, 1.00]; Low-Level Intermittent > Low-Level Chronic, $p < .001$, $d = 0.93$ [95% CI 0.71, 1.16]).

Lifetime Total Charges

The Early Escalator group had the greatest number of individual charges over their criminal careers but only significantly more so than the Low-Level Intermittent offenders (Early Escalator > Low-Level Intermittent, $p = .002$, $d = 0.65$ [95% CI 0.36, 0.94]). The Low-Level Intermittent group also had significantly fewer criminal charges than the Low-Level Chronic group (Low-Level Intermittent < Low-Level Chronic, $p < .001$, $d = 0.45$ [95% CI 0.24, 0.66]).

Total Sexual Offences

The Early Escalator group had the most sexual offences, significantly more than both the Low-Level Intermittent group and the Low-Level Chronic group, (Early Escalator > Low-Level Intermittent, $p = .050$, $d = 0.43$ [95% CI 0.14, 0.72]; Early Escalator > Low-Level Chronic, $p = .015$, $d = 0.45$ [95% CI 0.18, 0.72]).

Total Non-Sexual Offences

The Low-Level Chronic group had the highest number of non-sexual offences, significantly more than both the Late Escalator group and the Low-Level Intermittent group (Low-Level Chronic > Late Escalator, $p = .04$, $d = 0.36$ [95% CI 0.10, 0.62]; Low-Level Chronic > Low-Level Intermittent, $p < .001$, $d = 0.57$ [95% CI 0.36, 0.79]). The Early Escalator group also had significantly more non-sexual offences than the Low-Level Intermittent group (Early Escalator > Low-Level Intermittent, $p = .032$, $d = 0.54$ [95% CI 0.25, 0.82])

Unique Court Contacts

The Low-Level Intermittent offenders had the fewest unique court contacts compared with all other groups (Low-Level Intermittent < Early Escalator, $p = .025$, $d = 0.49$ [95% CI 0.20, 0.78]; Low-Level Intermittent < Late Escalator, $p = .032$, $d = 0.26$ [95% CI 0.01, 0.53]; Low-Level Intermittent > Low-Level Chronic, $p < .001$, $d = 0.95$ [95% CI 0.73, 1.16]). The Late Escalator group also had significantly fewer unique court contacts than the Low-Level Chronic offenders (Late Escalator < Low-Level Chronic, $p < .001$, $d = 0.69$ [95% CI 0.43, 0.94]).

Total Time in Custody

The Early Escalator group spent more months in secure custody than all other trajectory groups, but only significantly more so than the Low-Level Intermittent group

and the Low-Level Chronic group (Early Escalator > Low-Level Intermittent, $p = .008$, $d = 0.87$ [95% CI 0.58, 1.16]; Early Escalator > Low-Level Chronic, $p = .012$, $d = 0.80$ [95% CI 0.53, 1.08]).

Length of Criminal Career

The Low-Level Chronic group had the longest criminal career compared with all other groups (Low-Level Chronic > Early Escalator, $p < .001$, $d = 0.84$ [95% CI 0.56, 1.11]; Low-Level Chronic > Late Escalator, $p = .003$, $d = 0.53$ [95% CI 0.27, 0.78]; Low-Level Chronic > Low-Level Intermittent, $p < .001$, $d = 1.10$ [95% CI 0.88, 1.32]). The Late Escalator group had the second longest criminal career, which differed significantly from the than the Low-Level Intermittent group (Late Escalator > Low-Level Intermittent, $p < .001$, $d = 0.57$ [95% CI 0.30, 0.84]).

Predicting Trajectory Group Membership

A series of multinomial logistic regressions were conducted to test the remaining hypotheses regarding indicators of sexual interest in children, victim types, and trajectory group membership. For descriptive purposes, Table 5 includes the percentage of those in each trajectory group who offended against each victim type of interest, whereas Table 6 and 7 include the results of multinomial logistic regressions predicting group membership by victim characteristics and indicators of sexual interest in children, respectively.

Child Victims

It was hypothesized that having at least one child victim would be associated with membership to either the Early Escalator or the Late Escalator group compared to the other groups, however this hypothesis was not fully supported (see Table 6). While a significant relationship was found between group membership and having child victims

($\chi^2(3) = 8.43$, $R^2_{McF} = 0.006$, $p = .038$) this relationship was not explained by membership to either the Early or Late Escalators over that of the other groups.

Although the focus of this hypothesis was on membership to the Escalator groups, further understanding of the relationship between having child victims and trajectory membership is important to understand. Therefore, two post hoc analyses were conducted to better understand the significant multinomial regression result. Post hoc analyses determined that having any child victims was associated with membership to the Low-Level Intermittent group ($OR = 1.74$, $95\% CI = 1.13, 2.69$, $p = .013$) over that of the Low-Level Chronic group. Additionally, because the profiles of those who commit incest offences against children are often different from those who offend against unrelated children (Seto, 2018), the main analysis was conducted again, this time excluding related victims. This analysis determined that having extrafamilial child victims was significantly associated with membership to the Early Escalators over that of the Low-Level Chronic group ($\chi^2(3) = 9.06$, $R^2_{McF} = 0.007$, $p = .028$). Specifically, it was found that those with extrafamilial child victims were 49% less likely to belong to the Low-Level Chronic group compared with the Early Escalator group ($OR = 0.51$, $95\% CI = 0.29, 0.91$, $p = .023$).

Indicators of Sexual Interest in Children

For the third hypothesis, it was expected that all three indicators of sexual interest in children would be associated with membership to both the Early Escalator group and the Late Escalator group compared with the other groups (see Table 7 for regression results and Table 8 for proportions of those in each group exhibiting indicators of a sexual interest in children). The following analyses were conducted twice, first using the Early Escalators as the reference category, and subsequently using the Late Escalators.

For the first indicator of a sexual interest in children, higher pedohebephilic index scores decreased the likelihood of belonging to the Low-level Chronic group over the Early Escalators by 39% ($OR = 0.61, p = .005$). Pedohebephilic index scores were not found to be associated with membership to the Late Escalator group over the other groups. For the second indicator, the presence of a self-reported sexual interest in children decreased the likelihood of belonging to the Low-Level Chronic group over the Early Escalator group by 59% ($OR = 0.41, p = .005$). A sexual interest in children was not found to be associated with membership to the Late Escalator groups over the other trajectories. Lastly, as scores on the SSPI-2 increased, the likelihood of belonging to the Low-Level Chronic group over the Early Escalator group decreased by 30% ($OR = 0.70, p < .001$), and the likelihood of belonging to the Low-Level Chronic group over the Late Escalator group decreased by 19% ($OR = 0.81, p = .029$).

Taken together these findings indicate partial support for the hypothesis that all three indicators of a sexual interest in children would be associated with membership to the Early Escalator group. The three indicators of sexual interest in children were consistently associated with group membership to the Early Escalator group over the Low-Level Chronic group. Nonetheless, only one of the indicators (SSPI-2 scores) was associated with membership to the Late Escalator group compared with the Low-Level Chronic group.

Incest Victims

Contrary to the hypothesis, having incest victims was not associated with membership to any offending trajectory group ($\chi^2(3) = 3.52, R^2_{McF} = 0.026, p = .318$). Table 6 contains the results for this analysis.

Adult Female Victims

Contrary to the stated hypotheses, having an adult female victim (victim aged 17 years or older) was not associated with membership to the Low-Level Intermittent group compared with the other groups. Nonetheless, having an adult female victim was associated with membership to both the Late Escalator group ($OR = 2.10, p = .042$) and the Low-Level Chronic ($OR = 2.21, p = .007$) group compared with the Low-Level Intermittent offenders. Specifically, those with an adult female victim were 2.1 times more likely to belong to the Late Escalator group and 2.21 times more likely to belong to the Low-Level Chronic group compared with the Low-Level Intermittent group.

Discussion

Although adult-onset offenders have been known to researchers for a number of years (Beckley et al., 2016; Eggleston & Laub, 2002; Sapouna, 2017; Sivertsson, 2018), research on the offending trajectories of AOSOs is limited. The goal of the current study was to examine the offending trajectories of a sample of AOSOs, and to determine whether a sexual interest in children was associated with membership to any one of the groups. GBTM was used to identify the patterns of offending between the ages of 18 and 60 in a sample of individuals ($n = 520$) who began offending in adulthood and committed at least one sexual offence. A four-group model was chosen to best represent the patterns of offending present in the sample, and mixed support for the hypotheses regarding indicators of a sexual interest in children, and victim characteristics within the groups were found. The characteristics of each of the identified trajectory groups are discussed below with consideration of the implications of the findings. Readers are reminded that when interpreting the identified trajectories, it is important to remember that the trajectories which are identified using GBTM are mathematically derived, and individual group membership is based on probabilities (Nagin, 2005). As such, the identified groups,

though theoretically important, require further research before they can be applied to real world offender groups.

Identified Trajectories

The Escalator Groups

Two escalator groups were found in the present study. First, the Early Escalator group comprised approximately 13% of people in the sample and were characterized by an escalation of offending which started in their early 30s and peaked in their mid 40s. The Early Escalator group had the earliest onset of self-reported sexual offending out of all the groups, which appeared to occur just before their escalation in offending. This group also had the highest total number of charges, significantly more so than the Low-Level Intermittent group; committed the highest number of sexual offences and spent the most time in secure custody, significantly more so than both the Low-Level Intermittent and Low-Level Chronic groups.

It was hypothesized that having a child victim would be associated with membership to the Early Escalator group. While having *any* child victim was not associated with membership to the Early Escalator group it was found that having extrafamilial child victims was associated with membership to the Early Escalator group over that of the Low-Level Chronic group. This is important to note because having extrafamilial child victims is associated with a higher risk for sexual recidivism and is also associated with a sexual interest in children (Seto, 2008; Seto et al., 2017). Indeed, all three indicators of a sexual interest in children were associated with membership to the Early Escalator group compared with the Low-Level Chronic group.

Taken together, these findings suggest that those who belong to the Early Escalator group appear to be at high risk for sexual offending, particularly against

unrelated children, and that their offending is likely motivated, in part, by a sexual interest in children. Further, the Early Escalator group's offending appeared to escalate over their lifespan. While further research is required before it can be determined that the Early Escalator group is a real-world phenomenon, the findings of this study suggest that the Early Escalator group may present with unique clinical needs based on the profile found in the present thesis. As the Early Escalator group appears to be at a higher risk for repeated offending than other groups, they may require more intensive risk management strategies than other offenders when they are inevitably released back into the community (Schaefer, 2019). These strategies could include a greater emphasis on regular monitoring, strong supervisory practices, and more stringent behaviour conditions when released in the community (Booth & Kingston, 2016; Finkelhor, 2009).

Additionally, a greater proportion of individuals in the Early Escalator group may require specialized sexual offender treatment interventions to help reduce their risk of sexual offending and manage their sexual interest in children. Sexual offender treatment interventions commonly include strategies such as cognitive-behaviour therapy, surgical castration, and a suite of pharmacological methods which aim to reduce sex-drive (Booth & Kingston, 2016). Sex offender treatment interventions have been shown to reduce rates of recidivism amongst sexual offenders, though these reductions have generally been found to be modest (Kim et al., 2016; Schmucker & Lösel, 2015). Physical interventions, such as surgical castration tend to show the strongest effects, though come with ethical and legal considerations (Kim et al., 2016; Schmucker & Lösel, 2015).

Given that the Early Escalator group experienced a relatively high number of unique court contacts, as well as spending a considerable amount of time in secure custody, this may suggest a group which is either resistant to treatment, or a group that

does not currently have access to adequate resources to prevent or manage their sexual offending. While this hypothesis is largely speculative, a group which confers as much risk as the Early Escalator group yet does not receive adequate or appropriate treatment should be a significant concern, given their potential risk to the community. Notably, offenders who receive treatment that is not reflective of their individual needs have been shown to have worse outcomes than those whose treatment follow the Risk-Need-Responsivity model of treatment (Hanson et al., 2009). Interestingly, the Early Escalator group appears to mirror the fears that have been toted around JSO populations in the past, particularly in that they appear prone to persistent sexual offending (Campregher & Jeglic, 2016; Zimring, 2004).

Given the association between the Early Escalator group and indicators of a sexual interest in children, it is interesting that their onset of sexual offending occurred in adulthood. Paraphilias are a powerful motivator for sexual offending, and a sexual interest in children is one of the strongest motivators for future sexual offending (Mann et al., 2010; Seto, 2019). An important question to consider is why these groups are offending in adulthood when they have apparently successfully navigated the impulsivity of puberty and have already become established adults. As previous authors have suggested, AOs may have had early-life protective factors which prevented them from offending until those factors fell away in the transition into adulthood (Gibson & Krohn, 2013). These protective factors could include involvement in school, overbearing home lives, or poor social skills which isolated AOSOs from peers, or even delayed pubertal onset (Blanchard & Dickey, 1998; Gibson & Krohn, 2013). It is possible that this same explanation could apply to the Early Escalator group in the sample.

It is also important to note that adult-onset patterns of offending behaviour could simply be a result of how sexual offending is dealt with in the Canadian Justice system. Some sexual offending behaviours can continue for a number of years before being reported, and the identified escalation in offending behaviour could simply reflect an age when previous misdeeds were finally reported. Additionally, the bumps in offending could simply reflect age-gates of opportunity across the lifespan (Francis et al., 2014). Although an individual may have a sexual interest in children, the opportunity to act on the interest may not present itself until an age when they have access through employment, or when friends, family, or themselves begin to have children (Beckley et al., 2016; Thornberry, 2010).

In addition to the Early Escalator group, a Late Escalator group was found that represented 16% of the sample. The Late Escalator group was characterized by an onset of offending in their early-30s which escalated and peaked in their mid-50s. The Late Escalator group was younger during their first official and sexual offences, experienced more unique court contacts and had a longer criminal career than the Low-Level Intermittent group. The Late Escalator group was also younger at their first official offence, had fewer non-sexual offences and unique court contacts, and spent less time in custody than the Low-Level Chronic group.

It was hypothesized that the Late Escalator group would reflect an older version of the Early Escalator group. While it is true that based on criminal career parameters, the two groups only significantly differed on the later onset of sexual offending of the Late Escalator group, the two groups deviated more when considering the indicators of sexual interest in children and victimology. Like the Early Escalator group, it was predicted that membership to the Late Escalator group would be associated with having child victims, as

well as the three indicators of a sexual interest in children. Contrary to this hypothesis, having child victims was not associated with membership to the Late Escalator group, and only scores on the SSPI-2 were associated with membership to the Late Escalator group over the Low-Level Intermittent group. On the contrary, it was found that having an adult female victim was associated with membership to the Late Escalator group over the Low-Level Intermittent group. Although not statistically compared, the Late Escalator group also contained the highest proportion of incest offenders out of the four identified groups.

Taken together, the previous findings present the Late Escalator group as exhibiting a similar pattern of offending to the Early Escalator group, though their sexual offending may not necessarily be motivated by a sexual interest in children. Although this group contains a high proportion of incest offenders, incest offending is not necessarily associated with a sexual interest in children (Seto et al., 2015). Sexual offending can be facilitated or motivated by a number of factors such as having a high sex drive, substance use, impulse dysregulation, or an interest in coercive sexual behaviour (Seto, 2019). Although an association between scores on the SSPI-2 and membership to the Late Escalator group was found, it is important to remember that the information used to score the SSPI-2 was collected only once during the CAMH assessment.

Taken together, both the Early and Late Escalator groups appear to mirror patterns of offending first identified by both Lussier et al. (2010) and Francis et al. (2014). In both previous studies, the authors identified groups whose offending began in early adulthood and appeared to escalate over the lifespan. Similar to the Late Bloomers identified in Lussier et al. (2010) the offending of both the Early and Late Escalator groups were not limited to sexual offending, and both groups exhibited accompanying patterns of non-sexual offending. In Francis et al. (2014) the high-rate persistent and low-rate persistent

groups exhibited higher rates of sexual offending than the other identified groups and it was found that those with child victims were “overrepresented” in both groups. It was suggested by Lussier et al. (2010), that the escalating pattern of offending could reflect criminal careers which begin with non-sexual offences and escalate in severity until the onset of sexual offending. Contrary to this suggestion, the onset of sexual offending of both the Early and Late Escalator groups occurred before their official onset of offending. It is important to note that in the present study, sexual offending was based on self-report as well as official records, where non-sexual offending relied entirely on official records. It is possible that if a measure of non-sexual offending were included, a different pattern could emerge.

Low-Level Intermittent Group

The Low-Level Intermittent group comprised approximately 30% of the sample. The offending behaviour of this group was characterized by a low level of intermittent offending across the lifespan, which was largely limited to clusters of offending in both early and late adulthood. The Low-Level Intermittent group had the oldest average onset of both their sexual and official offending, the fewest unique court contacts, and the fewest non-sexual offences of all the identified groups. They also had fewer total lifetime charges and fewer non-sexual offences than both the Early Escalator group and the Low-Level Chronic group. The Intermittent group also had the shortest criminal careers, significantly shorter than both the Late Escalator group and Low-Level Chronic group. These findings place the Low-Level Intermittent group in line with low-level offending trajectories which are commonly found in trajectory research (Francis et al., 2014; Lussier et al., 2010; McCuish et al., 2016; Reale et al., 2019). Given that the Low-Level Intermittent group appears to be at low risk for sexual recidivism, it is unlikely that they

would require access to specialized sexual offender treatment. Meta-analyses of the efficacy of sex offender treatment interventions have shown that treatment is least effective when applied to low-risk offenders (Hanson et al., 2009; Kim et al., 2016; Schmucker & Lösel, 2015).

It was hypothesized that the Low-Level Intermittent group would be most likely to have adult female victims, but this hypothesis was not supported. On the contrary, this group had the lowest proportion of individuals with adult female victims of all the identified trajectories.

Low-Level Chronic Group

The final identified trajectory was labelled the Low-Level Chronic group and made up the largest proportion of the sample (43%). The Low-Level Chronic group was characterized by a persistent low-moderate level of sporadic offending which persisted over the lifespan. The Low-Level Chronic group experienced the longest criminal career out of all the identified trajectories, averaging just over 13 years in total. This group also displayed the youngest age of official offending onset as well as the most non-sexual offences and unique court contacts (more so than the Late Escalator and Low-Level Intermittent groups). The Low-Level Chronic group also earned fewer total sexual offences and less time in secure custody than the Early Escalator group. Finally, this group earned more lifetime charges than the Low-Level Intermittent group.

It was hypothesized that the Low-Level Chronic group would be associated with being more likely to have incest victims compared with the other groups, however this hypothesis was not supported. On the contrary, this group was associated with having adult female victims, compared with the Low-Level Intermittent group. Further, the Low-

Level Chronic group had the lowest proportion of members with child victims, or any of the three indicators of a sexual interest in children of all other groups.

Taken together, these findings suggest that members of the Low-Level Chronic group may exhibit a general pattern of antisociality across their lifespan which eventually results in the commission of a sexual offence. From a prevention and treatment standpoint, this group may not require targeted sexual offender treatment though they may still present risk for general recidivism (Hanson & Morton-Bourgon, 2005; Harris & Hanson, 2004; Lussier & Davies, 2011). Given their potential risk for future general offending, the Low-Level Chronic group may benefit from more standard offender programming.

While a group characterized by chronic offending is common in trajectory research (Piquero, 2008), it is interesting that the group survived exclusionary criteria for the study, given that chronic offenders typically begin their criminal career early in adolescence (refer to Table 1 for brief review of adolescent trajectory research). It should be noted that the Low-Level Chronic group's frequency of offending is lower than that of chronic groups which are typically identified in trajectory research samples (McCuish et al., 2016; Reale et al., 2019). This difference may provide support for the idea that the present Low-Level Chronic group is distinct from traditional chronic offenders and may signal that study exclusions were successful in filtering out many of those with extensive adolescent criminal involvement. The onset of low-level chronic offending in early adulthood may be precipitated by difficulties experienced during the transition into adulthood such as employment difficulty, substance use, or the onset of serious mental illness (Beckley et al., 2016; Thornberry, 2010).

Limitations

This study has several methodological limitations which must be considered. First, the sample used in this study consisted primarily of men who had sexually offended against a child and were referred to a sexual behaviour clinic because of their problematic sexual interests or behaviour. Therefore, the trajectories identified in this sample may not be generalizable to other AOSOs. In comparison with the present study sample, Francis, et al. (2014) used a sample of individuals who were referred for involuntary civil commitment and tended to be at higher risk for recidivism. Lussier (2010) used a more representative sample which consisted of almost all sex offenders who were admitted to a federal penitentiary in Quebec, Canada between 1994 and 2000. In both samples, the proportion of those who offended against children was below 50%, compared to the present study sample where ~88% had offended against a child.

The next limitation to consider is that the study primarily relied on official offending records for the trajectory analyses. The reliance on official records has been known to underestimate the actual rate of offending in a population (Eggleston & Laub, 2002; Farrington et al., 2014). This presents a few issues for the present study, one of which is for the proper identification of AOSOs for inclusionary purposes. Moffitt (2018) insists that there is no such thing as AO offenders, and that all people who appear to be so were simply not caught until adulthood. It is possible that some of the identified AOSOs *were* offending in adolescence and were not reported or not caught during that time. The concern of underreporting is especially relevant to the study of sexual offending, as many behaviours can persist undetected for years before being reported. This relationship can result in a cluster of charges which is removed from the offending behaviour and may not be reflective of the underlying pattern of offending.

It should also be noted that in Canada, offence histories are often sealed via record suspensions, provided that an individual meet certain criteria after serving their sentence (Criminal Records Act, 1985). The exact criteria has been subject to change over time, though the Act generally describes the number of years that an individual must remain without additional offences (e.g., five years for summary conviction or 10 years for indictable offences) before their records may be suspended (Criminal Records Act, 1985; Hanson & Nicholaichuk, 2000). Records typically remain sealed unless an individual commits an additional summary or indictable offence, in which case a record suspension may be revoked. Additionally, sexual offences involving victims under the age of 16 are ineligible for suspension (Criminal Records Act, 1985).

Related to the issue of sealed offence records, youth criminal records are also subject to suspension, provided that no additional offences occur within access windows (three years for summary convictions, and five years for indictable offences), and that no adult convictions occur during the access window of a youth offence (resulting in previous unsealed youth offences becoming part of adult offence history; Youth Criminal Justice Act, 2002). According to the legislation, there are exceptions to this, which include indictable offences causing serious bodily harm such as murder or aggravated sexual assault (Youth Criminal Justice Act, 2002).

The above information on record suspensions serves to highlight that *some* criminal offences may be hidden from the CPIC which this study relied on for criminal offence data. This systematically hidden offending introduces the possibility that some individuals may be incorrectly identified as having began offending in adulthood and that some offences that individuals committed may not have been reflected on the record. The issue is of particular salience since we only had self-reported information for when

individuals first started sexually offending, but this was not asked for non-sexual offending. Nonetheless, the above information also highlights that those who have committed serious indictable offences in youth or adulthood are less likely to have their records sealed, meaning that those with *serious* patterns of offending in adolescence would be more likely to be correctly excluded from the study sample. Although these more serious offenders were likely to be correctly filtered out, it is likely that some individuals with hidden adolescent offending survived the filter and made it into the sample.

It has been recommended that researchers factor in self-reported offending when conducting trajectory research in order to alleviate the issue of systematically hidden offending (Gomez-Smith & Piquero, 2005; Piquero, 2008). To mitigate these issues, self-reported sexual offending was used to exclude those who reported sexually offending before the age of 18, though inclusion of self-reported non-sexual offending would have further assuaged these concerns (Eggleston & Laub, 2002). Although the inclusion of this information certainly helps mitigate these concerns, it should also be noted that self-reported offending could be systematically biased, such as in cases where a participant was being assessed at CAMH to inform an upcoming sentencing decision. Notably, pre-sentence clients may be more motivated to lie about or choose not to disclose prior offending for fear of increasing their perceived risk for recidivism, and thereby influencing their sentencing outcome.

Finally, the trajectories were analyzed using retrospective data, and therefore future research is required to assess the validity of the identified trajectories. Retrospective analysis also presents a problem when considering the victim variables used in this study. Victim information was collected during the CAMH assessment, and

so victim information related to offending which occurred after the assessment was not captured in the dataset. This presents an obvious problem for the hypotheses concerning victim variables, as well one of our indicators of sexual interest in children (scores on the SSPI-2). Fortunately, the majority (84.8%) of individuals in the sample did not sexually recidivate over the study period, which in some ways mitigates this as a significant concern. Nonetheless, victim information could have changed after the sexual offence if individuals continued to offend, which would also have impacted scores on the SSPI-2. Therefore, we placed greater weight on the pedohebephilic index scores and self-reported sexual interest, which would likely remain relatively stable over the lifespan (Grundmann et al., 2016; Seto, 2012).

Future Research Directions

There are a few important future research directions to consider as a result of the current study. First, although an Early Escalator group has been identified in this dataset, significant work must be completed before it can be determined that this is a homogenous real-world group, and not just a by-product of the trajectory analyses used in this study. Second, if Early Escalators are found to exist, then effort should be made to understand the factors which precede and precipitate their delayed onset offending onset.

To properly address whether Early Escalators are a real-world phenomenon, further effort should be applied to identifying Early Escalators in additional more representative sexual offender datasets. The next stage in the research would be to conduct a prospective, longitudinal study of a group of AOSOs. Given that longitudinal studies are resource and time intensive processes, the first stage of this research is necessary to bolster the body of evidence supporting the existence of the Early Escalator group and provide justification for such a study. Next, the longitudinal study should

account for a wide variety of early and current life factors to develop a fulsome understanding of the factors which constitute the etiology and onset of Early Escalators offending trajectories.

Conclusion

To date, the current study is the only one to the author's knowledge which has explicitly examined the offending trajectories of AOSO's. The current study identified a small group of AOSOs who are at a higher risk for victimizing children, and their offending may be motivated by a sexual interest in children. Although more research must be conducted before concluding that Early Escalators are generalizable outside of this sample, there is limited research supporting its existence (Francis et al., 2014; Lussier et al., 2010). If the group does exist, then a concerted effort should be applied to clarifying the etiology of this pattern of behaviour to better identify this particular group. By identifying the factors which precede their offending, then perhaps a way of identifying these individuals before their escalation in offending begins may be developed. For now, a number of research questions remain to be addressed.

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Table 1.*Overview of Examined Juvenile Sex Offender (JSO) Research*

Author(s)/Date	Purpose	Number of Trajectories	Identified Trajectories
Lussier, et al., 2012	Identify sexual and non-sexual offending trajectories of JSOs through adolescence and into adulthood. Goal to determine whether non-sexual offending followed patterns of general offending ($n = 498$).	Five non-sexual, two sexual	<p>Non-sexual - Very low-rate: Only one offence on average during study period (53.0%). Adolescent-limited: High rate of offending largely confined to adolescence, desisting by age 25. (11.0%). Late starters: Low offending in youth which increased and peaked in early 20s (21.3%). High-rate: Chronic offending which began very high in childhood and maintained until the early 30s (4.2%). Late bloomers: High rate of offending comparable to high-rate offenders, later onset and peak (10.4%)</p> <p>Sexual - High-rate slow desisters: Offending which peaks at age 12 and desists into the 30s (10.4%). Adolescent-limited: Offending which peaks at 14 and terminating by early adulthood (89.6%).</p>
McCuish, et al., 2016	To determine whether JSOs ($n = 52$) and juvenile non-sexual offenders ($n = 231$) exhibited different patterns of general offending.	Four	<p>Low-rate group: On average, less than one offence per year in the data which desisted by age 20 (17.7%). Bell-shaped group: Offending which increased throughout adolescence, peaked at 15, and then desisted around age 20 (35.0%). Slow-rising chronic: Rate of offending continued to rise through adolescence and into adulthood (27.2%). High-rate Chronic: Offending started very high in adolescence and maintained ~2 convictions a year in adulthood (20.1%).</p>
Cale, et al., 2016	To determine whether the type of sexual offences committed by JSOs would relate to the offending trajectory they belonged to ($n = 217$).	Four	<p>Rare Offenders: Infrequent offending over study period (53.0%). Late bloomers: Started off offending slowly and escalated into late adolescence (25.3%). Low-rate chronics: Offending which peaked in mid-adolescence and desisted towards the onset of adulthood (10.1%). High-rate chronics: Maintained a consistent high level of offending over study period (11.5%)</p>
Reale, McCuish, & Corrado, 2019	Purpose to distinguish whether the presence of a sex offence during adolescence predicted future offending behaviours of JSOs in adulthood ($n = 909$)	Five	<p>Group 1: Slow rise in offending occurring between 18 and 25, possibly representing an adult onset (16.8%). Group 2: Adolescent-limited offending which dropped off between 18 and 19 (45.8%). Group 3: Extended adolescent-limited offending which almost completely desisted between 18 and 25 (14.5%). Group 4: Highest level of offending at outset which declined to high-stable level of offending (9.5%). Group 5: Consistent level of offending similar to Group 4, representative of life-course persistent offending (13.4%).</p>

Table 2.*BIC and Cross-Validation Error Values Used for Trajectory Model Selection*

# of Groups in Model	BIC	CVE
1	27921.60	0.71
2	24927.26	1.09
3	23517.52	1.61
4 ^a	22584.82	1.53
5	21973.78	1.89
Four-Group Model		
Equation		
Quadratic-Quadratic	22667.07	2.11
Quadratic-Cubic	22750.62	1.96
Cubic-Quadratic ^b	22557.86	1.59
Cubic-Cubic	22584.82	1.53

Note: BIC = Bayesian Information Criteria, CVE = Cross validation error.

^a Number of groups in final model.

^b Functional form of final model equation.

Table 3.*Fit Statistics for Four-Group Trajectory Model (n = 520)*

	Offending Trajectories			
	G1: Early Escalators	G2: Late Escalators	G3: Low-Level Intermittent	G4: Low-Level Chronic
<i>n</i> (%)	70(13.46)	83(15.96)	145(27.89)	222(42.69)
Median PP	0.97	0.92	0.92	0.99
Probability Range	0.39-1.00	0.49-1.00	0.47-1.00	0.37-1.00
Mean probability: G1	0.89	0.03	0.01	0.07
Mean probability: G2	0.02	0.85	0.01	0.13
Mean probability: G3	0.03	0.05	0.86	0.07
Mean probability: G4	0.02	0.06	0.02	0.91
OCC	7.98	5.60	6.10	10.07

Note: G1 = Group 1, G2 = Group 2, G3 = Group 3, G4 = Group 4, Median PP =

median posterior probability of those assigned to group, OCC = odds of correct classification into group.

Table 4.*Criminal Career Parameters of Four Offending Trajectories of Adult-Onset Sexual Offenders*

Criminal Career Parameters	Early Escalators (<i>n</i> = 70)	Late Escalators (<i>n</i> = 83)	Low-Level Intermittent (<i>n</i> = 122)	Low-Level Chronic (<i>n</i> = 222)	Omnibus Welch Test, ω^2
Age of first official offence	29.9(11.0)	33.3(10.3)	45.6(9.4) ^{a,b}	28.6(8.9) ^{b,c}	$F(3, 189.6) = 92.7^{***}$, $\omega^2 = .35$
Age of first sexual offence	26.3(7.3)	32.9(7.2) ^a	39.3(11.0) ^{a,b}	31.0(8.7) ^{a,c}	$F(3, 210.7) = 34.9^{***}$, $\omega^2 = .16$
Lifetime total charges	13.8(15.7)	10.5(14.6)	6.5(8.4) ^a	11.6(9.7) ^c	$F(3, 184.8) = 11.4^{***}$, $\omega^2 = .06$
Total sexual offences	7.1(6.7)	6.7(7.6)	4.6(6.3) ^a	4.5(4.1) ^a	$F(3, 178.7) = 4.9^*$, $\omega^2 = .02$
Total non-sexual offences	6.7(13.9)	3.8(9.6)	1.9(5.7) ^a	7.1(8.7) ^{b,c}	$F(3, 186.9) = 16.9^{***}$, $\omega^2 = .08$
Unique court contacts	3.4(4.9)	2.6(2.8)	1.7(1.3) ^{a,b}	5.0(4.1) ^{b,c}	$F(3, 180.9) = 42.8^{***}$, $\omega^2 = .19$
Total time in custody	41.5(73.3)	18.6(24.3)	11.4(30.2) ^a	13.6(17.7) ^a	$F(3, 175.1) = 4.6^*$, $\omega^2 = .02$
Length of criminal career	5.5(7.9)	8.3(10.3)	3.2(6.0) ^b	13.1(10.4) ^{a,b,c}	$F(3, 201.6) = 45.3^{***}$, $\omega^2 = .20$

Note: Means and standard deviation are reported. Total time in custody, and length of criminal career reported in months.

Homogeneity of variance is violated, Welch's test used in all analyses.

^a Indicates significantly different from Early Escalator

^b Indicates significantly different from Late Escalator

^c Indicates significantly different from Low-Level Intermittent

^d Indicates significantly different from Low-Level Chronic

ω^2 Effect size = Omega squared

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

Table 5.*Proportion of Each Offender Type Within Trajectory Group*

	Early Escalators (<i>n</i> = 70)	Late Escalators (<i>n</i> = 83)	Low-Level Intermittent (<i>n</i> = 145)	Low-Level Chronic (<i>n</i> = 222)
Child Victim	62(88.6)	73(88.0)	128(88.3)	175(78.8)
Incest Victim	19(27.1)	33(39.8)	44(30.3)	77(34.7)
Adult Female Victim	13(18.6)	19(22.9)	18(12.4)	53(23.9)

Note: Count and percentages reported *n*(%). Reported percentage are within group

percentages.

Table 6.*Odds-Ratios Predicting Trajectory Membership by Victim Type (n = 520)*

<i>Reference Group</i>	<i>Victim Type</i>			
Early Escalator	Child Victim	$\chi^2(3) = 8.43, R^2_{McF} = 0.01, R^2_N = 0.02, p = .038$		
		<i>b(SE)</i>	<i>OR</i>	<i>95% CI</i>
	Late Escalator	-0.06(0.51)	0.94	0.35, 2.53
	Low-Level Intermittent	-0.03(0.46)	0.97	0.40, 2.37
	Low-Level Chronic	-0.73(0.41)	0.48	0.22, 1.07
Late Escalator	Child Victim	$\chi^2(3) = 8.43, R^2_{McF} = 0.01, R^2_N = 0.02, p = .038$		
		<i>b(SE)</i>	<i>OR</i>	<i>95% CI</i>
	Early Escalator	0.06(0.51)	1.06	0.40, 2.86
	Low-Level Intermittent	0.03(0.43)	1.03	0.45, 2.37
	Low-Level Chronic	-0.67(0.38)	0.51	0.25, 1.06
Low-Level Chronic	Incest Victim	$\chi^2(3) = 3.52, R^2_{McF} = 0.003, R^2_N = 0.01, p = .318$		
		<i>b(SE)</i>	<i>OR</i>	<i>95% CI</i>
	Early Escalator	-0.35(0.30)	0.70	0.39, 1.27
	Late Escalator	0.22(0.27)	1.24	0.74, 2.09
	Low-Level Intermittent	-0.20(0.23)	0.82	0.52, 1.29
Low-Level Intermittent	Female Adult Victim	$\chi^2(3) = 8.33, R^2_{McF} = 0.01, R^2_N = 0.02, p = .040$		
		<i>b(SE)</i>	<i>OR</i>	<i>95% CI</i>
	Early Escalator	0.48(0.40)	1.61	0.74, 3.51
	Late Escalator	0.74(0.36)	2.10*	1.03, 4.27
	Low-Level Chronic	0.79(0.30)	2.21*	1.24, 3.96

Note: OR = Odds-ratio.* $p < .05$, *** $p < .001$.

Table 7.

Odds-Ratios Predicting Trajectory Membership Using Indicators of

Sexual Interest in Children (n = 520)

<i>Reference Group</i>	<i>Measure of Sexual Interest</i>			
Early Escalator	Pedohebephilia Index Score	$\chi^2(3) = 9.85, R^2_{McF} = 0.01, R^2_N = 0.02, p = .020$		
		<i>b(SE)</i>	<i>OR</i>	<i>95% CI</i>
	Late Escalator	-0.23(0.21)	0.79	0.53, 1.20
	Low-Level Intermittent	-0.23(0.19)	0.79	0.55, 1.15
	Low-Level Chronic	-0.50(0.18)	0.61*	0.43, 0.86
	Self-reported Sexual Interest	$\chi^2(3) = 8.25, R^2_{McF} = 0.01, R^2_N = 0.02, p = .041$		
		<i>b(SE)</i>	<i>OR</i>	<i>95% CI</i>
	Late Escalator	-0.37(0.37)	0.69	0.34, 1.43
	Low-Level Intermittent	-0.54(0.33)	0.58	0.30, 1.12
	Low-Level Chronic	-0.90(0.32)	0.41*	0.22, 0.77
	SSPI-2 Scores	$\chi^2(3) = 14.36, R^2_{McF} = 0.01, R^2_N = 0.03, p = .002$		
		<i>b(SE)</i>	<i>OR</i>	<i>95% CI</i>
	Late Escalator	-0.15(0.12)	0.86	0.69, 1.09
Low-Level Intermittent	-0.20(0.11)	0.82	0.66, 1.00	
Low-Level Chronic	-0.35(0.10)	0.70***	0.58, 0.86	
Late Escalators	Pedohebephilia Index scores	$\chi^2(3) = 9.85, R^2_{McF} = 0.01, R^2_N = 0.02, p = .020$		
		<i>b(SE)</i>	<i>OR</i>	<i>95% CI</i>
	Early Escalator	0.23(0.21)	1.26	0.84, 1.90
	Low-Level Intermittent	-0.001(0.18)	1.00	0.71, 1.41
	Low-Level Chronic	-0.27(0.17)	0.76	0.55, 1.06
	Self-reported Sexual Interest	$\chi^2(3) = 8.25, R^2_{McF} = 0.01, R^2_N = 0.02, p = .041$		
		<i>b(SE)</i>	<i>OR</i>	<i>95% CI</i>
	Early Escalator	0.37(0.37)	1.44	0.70, 2.98
	Low-Level Intermittent	-0.17(0.33)	0.84	0.44, 1.62
	Low-Level Chronic	-0.53(0.32)	0.59	0.31, 1.11
	SSPI-2 Scores	$\chi^2(3) = 14.36, R^2_{McF} = 0.01, R^2_N = 0.03, p = .002$		
		<i>b(SE)</i>	<i>OR</i>	<i>95% CI</i>
	Early Escalator	0.15(0.12)	1.16	0.92, 1.46
Low-Level Intermittent	-0.06(0.10)	0.95	0.78, 1.15	
Low-Level Chronic	-0.21(0.10)	0.81*	0.68, 0.98	

Note: OR = Odds-ratio. Reporting dichotomized self-reported sexual interest.

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

Table 8.*Proportion of Group Members within the Trajectory Groups of Indicators of Sexual Interest in Children.*

	Early Escalators (<i>n</i> = 70)	Late Escalators (<i>n</i> = 83)	Low-Level Intermittent (<i>n</i> = 145)	Low-Level Chronic (<i>n</i> = 222)
Pedohebephilia Index scores	46(65.7)	42(50.6)	83(57.2)	105(47.3)
Self-reported Sexual Interest	21(30.0)	19(22.9)	29(20.0)	33(14.9)
SSPI-2 Scores	31(44.3)	35(42.2)	47(32.4)	63(28.4)

Note: Count and percentages reported *n*(%). Table shows the percentage of each group which displays each sexual interest indicator. The criteria for each indicator to be considered present are as follows: pedohebephilia index scores must be equal or greater than 0.01; self-reported sexual interest indicated that the offender admitted to any degree of sexual interest in a child below the age of 15; and scores on the SSPI-2 must be 3 or higher.

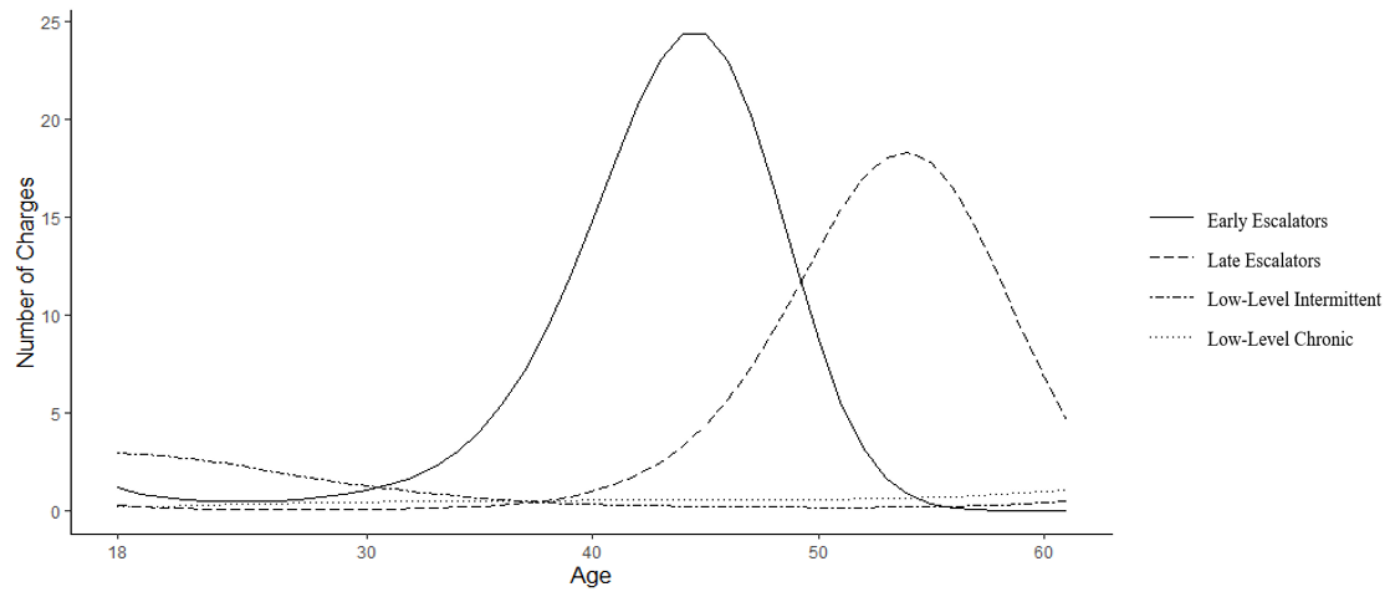


Figure 1. *Criminal Trajectories of Adult-Onset Sexual Offenders.*