

**Unraveling the foster care effect:  
An examination of criminal outcomes**

**by  
Jennifer Yang**

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# Approval

**Name:** Jennifer Yang

**Degree:** Master of Arts

**Title:** Unraveling the foster care effect: An examination of criminal outcomes

**Examining Committee:** **Chair: Maaïke Helmus**  
Assistant Professor

**Evan McCuish**  
Senior Supervisor  
Assistant Professor

**Martin Bouchard**  
Supervisor  
Professor

**Bryanna Fox**  
External Examiner  
Associate Professor  
Department of Criminology  
University of South Florida

**Date Defended/Approved:** July 15, 2019

## Ethics Statement

The author, whose name appears on the title page of this work, has obtained, for the research described in this work, either:

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## **Abstract**

Youth who are dually involved in both foster care and criminal justice systems represent a small minority of individuals with multi-problem risk profiles. Indeed, prior research has found that foster care youth are disproportionately more likely to continue a chronic level of offending in adulthood (Yang, McCuish, & Corrado, 2017). However, the nature of this relationship remains theoretically underexplored, and empirically underexamined. Extant research suggests that adverse childhood experiences have prevailing effects beyond the developmental period of childhood, and thus longitudinal research is required to further elucidate the effects of foster care on offending. The current thesis was guided by three theoretical frameworks under the developmental life-course criminology paradigm (propensity, developmental, and life-course theories). Using data from the Incarcerated Serious and Violent Young Offender Study, the criminal offending trajectories of 678 incarcerated youth were examined. A history of foster care placement was predictive of a high rate chronic offending trajectory, and this relationship was independent of hypothesized moderating variables including gang involvement, negative self-identity, substance use versatility, and parental maltreatment. Findings suggest greater need for ongoing support for foster care youth in their transition to adulthood.

**Keywords:** Developmental life-course criminology; foster care; offending trajectories; serious, violent, and chronic offenders.

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## List of Acronyms

BIC	Bayesian information criteria
CCO	Continuing custody order
CFCSA	Children, Family, and Community Service Act, 1996
CJS	Criminal justice system
CORNET	Corrections Network
CYIC	Children and youth in care
ISVYOS	Incarcerated Serious and Violent Young Offenders Study
MCFD	Ministry of Children and Family Development
MICE	Multivariate imputation by chained equations
MLR	Multinomial logistic regression
MVNI	Multivariate normal imputation
OCC	Odds of correct classification
RCY	Representative for Children and Youth
SD	Standard deviation
SPGM	Semiparametric group-based modeling
VCA	Voluntary care agreement
YAG	Youth Agreement
YCJA	Youth Criminal Justice Act
ZIP	Zero-Inflated Poisson

# Chapter 1.

## Introduction

Through the lens of developmental life course criminology (DLC), there are arguments for placement in foster care as either a “hook” (Giordano, Cernkovich, & Rudolph., 2002) for positive change for child victims of parental maltreatment and abuse or as a developmental “snare” (Moffitt & Caspi, 2001) acting as a barrier to the successful transition to adulthood. Generally, the current state of literature supports the latter perspective, as studies repeatedly affirmed the overlap between a history of foster care placement and negative outcomes in adulthood, including mental illness, substance use issues, academic difficulties, and antisocial behaviour (Corrado, Freedman, & Blatier, 2011; Cutuli et al., 2016; Ryan & Testa, 2005). Most of the current knowledge on these relationships have been identified through cross-sectional or retrospective studies measuring the prevalence of such outcomes among former foster care youth. However, a lack of prospective longitudinal data particularly among offending populations has resulted in studies with a limited scope on the relationship between foster care placement and longer-term offending outcomes.

There is an apparent paradox in the foster care-offending literature, extrapolating from maltreatment-offending research: although retrospectively there is a disproportionate amount of serious, violent, and chronic offenders with a history of foster care placement, it is likely the case that the majority of foster care youth do not become serious offenders. It is necessary to clarify that identifying the factors that determine whether or not foster care youth are at risk of offending is beyond the scope of the current thesis. Rather, using a prospective longitudinal sample of adjudicated youth, the current study focused on more clearly elucidating the nature of the relationship between placement in foster care and long-term patterns of offending among a sample of incarcerated serious and violent young offenders. Although extant research established a relationship between foster care and chronic patterns of offending (Ryan, Hernandez, & Herz, 2007; Yang, McCuish & Corrado, 2017), an underexplored theme concerns whether this relationship is specific to foster care itself, or whether this effect is due to

peripheral risk factors that are disproportionately more common among foster care youth compared to other youth adjudicated for their criminal behaviour.

Although research related to chronic, serious, and violent offenders is rooted in the criminal career paradigm, and informed by developmental life-course theoretical perspectives, much of the existing studies of the foster care-crime relationship is atheoretical. Although atheoretical research may yield useful short-term insights into the relationship, research that does not take into consideration the developmental implications inherent in placement in care is limited in its long-term utility, as are any policies that arise out of it. Thus, the current thesis uses a DLC-informed orientation in order to organize the research questions at hand. Specifically, based on three types of DLC theoretical perspectives (propensity, developmental, life course; as will be discussed at length in Chapter 3), the purpose of the current thesis was to explore the relationship between foster care and criminal offending trajectories between the ages of 12 to 23. In doing so, the current study addressed other researchers' call for studies examining potential mediating and moderating factors that elucidate the nature of this relationship (Malvaso, Delfabbro, & Day, 2018).

## **Chapter 2.**

### **Outcomes of Youth in Foster Care**

Placement in foster care is a marker for an accumulation of adverse experiences and negative outcomes. Children abused, neglected, or otherwise maltreated by their parents are typically placed in foster care with the intended purpose of protecting them from further harm (Jonson-Reid & Barth, 2000). However, placement in care necessarily includes the experience of separation from one's parents and being removed from their homes. Involvement with the foster care system is further associated with a number of adverse outcomes for the individual such as mental illness, substance abuse, serious and violent offending, and early mortality (Alltucker, Bullis, Close, & Yovanoff, 2006; Bullock & Gaehl, 2012; Cutuli et al., 2016; Jonson-Reid & Barth, 2000; Ryan & Testa, 2005). It is unsurprising then, that the relationship between foster care and offending has been consistently demonstrated in the latter half of the century (McCord, McCord, & Thurber, 1960). Youth who are dually involved in both the child welfare and youth justice systems represent a unique subset of offenders with interlinked histories of abuse or neglect and antisocial behaviour, which may then create barriers to traditional avenues of desistance from crime such as stable employment or prosocial adult relationships. As this current thesis examines a sample of youth in British Columbia, a brief overview of the child welfare system in British Columbia will be provided in section 2.1, and section 2.2 will provide a review of the empirical literature surrounding the foster care-offending relationship.

#### **2.1. Legislative Overview of Child Welfare Systems**

Canadian child welfare services are within the legislative jurisdiction of provincial/territorial governments, but also operate under federal legislation such as the *Canadian Charter of Rights and Freedoms*, and the *Canadian Criminal Code* (Bala, 2011). The current child welfare system is predicated on a balance between a child's right to protection from harm and the parents' rights to privacy and protection from unjustified allegations. Operating under principles of least interference and preservation of the family, removal from parental care is thus only justifiable if it is demonstrated that the child will be at significant risk of harm if he or she remains at home. In the Ontario

judgment *Re Brown* (1975), Justice Stortini clarified that “society’s interference in the natural family is only justified when the level of care of the children falls below that which no child in this country should be subjected to” (9 O.R. [2d] 185 at 189 [Ont. Co.Ct.]). Consequently, placement in foster care for Canadian children and youth occurs only for those that are already substantially more vulnerable than the general population, representing a small proportion of all children and youth who are at risk of harm and maltreatment (Kufeldt, 2011).

In British Columbia, reasons that a child may enter care are prescribed in ss.13(1) of the *Child, Family and Community Service Act* (CFCSA, 1996; see Appendix A), which include physical, sexual, emotional harm, deprivation of health care, unable or unwilling to care, absence, and abandonment. In a small audit sample of 100 youth in care in British Columbia, nearly half of all individuals entered care due to a parent unable/unwilling to care and approximately one third of the sample entered care because they experienced neglect and/or physical harm (British Columbia, 2013). In sum, in most cases, children and youth who enter the child welfare system enter due to reasons related to the level or lack of parental care rather than due to their own disruptive or unmanageable behaviours (Zayed & Harker, 2015).

Once the Ministry of Child and Family Development (MCFD) has determined that returning a child to their family is not feasible or poses risk of harm, children and youth under the age of 16 may be placed in a kinship home, a family-based foster care home, or a group home. A kinship home refers to placement in a home of a relative, whereas a family-based foster home refers to placement in a private residence of a non-relative in a family setting. Although placement in the home of biological family is preferable, when they are unable to care for the children, MCFD resorts to out-of-home placement (i.e., family-based foster home or group home). Group care encompasses various forms of residential-based care settings that often involve treatment services for mental health or substance related issues for a number of youth facing similar issues. Placement in a group home is typically seen as a last resort, as they tend to congregate high risk adolescents who exhibit higher rates of externalizing behaviours and conduct disorders, resulting in the amplification of negative outcomes (Farris-Manning & Zandstra, 2003; Helfinger, Simpkins, & Combs-Orme, 2000; McMillen et al., 2005). Youth between the ages of 16 and 18 are eligible for a Youth Agreement (YAG) if their safety is at risk and there is no caregiver that can care for them, which provides them with ministerial support

to live independently (Bala, 2011). Once youth reach the age of 19, they “age out” of the system, and no longer have access to the financial and social supports offered by MCFD (Rutman & Hubberstey, 2011). For the current thesis, foster care refers to placement in a foster home, group homes, single room occupations, and independent living arrangements.

Using a cohort sample of 50,551 children born in 1986 and attending a BC school in 1997 and 1998 the Representative for Children and Youth (RCY)<sup>1</sup> released a series of reports assessing the risk factors of foster youth in British Columbia. Consistent with the literature (as will be discussed later in the current chapter), the report identified disparities in outcomes pertaining to physical/mental health and wellbeing, educational needs and criminal justice involvement (British Columbia, 2006; 2007; 2009). The third and final report in the series focused specifically on the overrepresentation of foster youth the youth criminal justice system and found that 27% of those involved with the youth justice system had previously been in care (British Columbia, 2009). By the age of 21, approximately 41% of youth in care had been involved with the criminal justice system, compared to only 6.6% of the general sample. In addition, police were likely to recommend more charges against youth in care as they were recommended for an average of 10 charges, as compared to 4.5 charges recommended for youth without a history of foster care.

The RCY found that although low in incidence, foster care youth were responsible for a majority of the most serious and violent offences, including homicide, attempted murder, arson, and sexual assault (British Columbia, 2009). This suggests that youth in care were not only charged with a higher frequency of offenses, but they were also more likely to be charged with more serious types of offenses. Accordingly, over 10% of youth in care in the study were sentenced to secure or open custody by the age of 18, compared to only 0.5% of the general study population. Provisions in the Youth Criminal Justice Act (YCJA; 2002) ensure that incarceration is only reserved for serious and violent young offenders. Section 39(1) of the YCJA (2002; see Appendix B) requires that youth shall not be committed to custody unless they meet one of four conditions designating a threshold of seriousness. In other words, a custodial sentence reflects a

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<sup>1</sup> the RCY acts as an independent watchdog of the child welfare system in British Columbia, responsible for monitoring and providing reports on the performance of MCFD and investigates all serious injuries and deaths of youth in care

pattern of more serious and violent offending. Based on this, it is evident that young offenders with a history of foster care represent a minority of offenders but may be disproportionately responsible for patterns of offending that is both frequent and severe. Criminal career research indicates that these factors may then put these “crossover youth” (e.g. Dannerbeck & Yan, 2010) at a greater likelihood for continued involvement in a high and serious level of offending in adulthood as well. Although findings reported in the above section are specific to British Columbia, as is the sample in the current study, this pattern of results is not unique to a British Columbia context. The next section will review the empirical literature examining the association between foster care and offending.

## **2.2. Foster Care and Crime**

With respect to the foster care-crime relationship, the relative contributions of risk factors existing *prior* to entry into the foster care system and those that accumulate as the *result* of the foster care experience are still contested. However, what is not contested is the overlap of youth who are involved in both the child welfare and youth justice systems (e.g. Dannerbeck & Yan, 2011; Herz, Ryan, & Bilchik, 2010; Maschi, Hatcher, Schwalbe, & Rosato, 2008). An array of negative risk factors are correlated with both foster care placement and involvement in crime that may account for this relationship, such as child maltreatment and neglect, family dysfunction, externalizing behavioural problems, and substance use difficulties (Alltucker et al., 2006; Bullock & Gaehl, 2012).

There is a clear overlap between the risk factors that lead to foster care placement and the risk factors that lead to involvement with the juvenile justice system. One of the most consistently found correlates among serious, violent, and chronic offenders is childhood maltreatment and trauma (Loeber & Farrington, 2000), and foster care youth are disproportionately victims of such experiences (Jonson-Reid & Barth, 2000). Given the prevalence of victimization among those who become involved in the child welfare system, they are at an elevated state of vulnerability even prior to their placement in care. Correspondingly, despite the greater likelihood of disruptive behaviours among these children, placement in care is more typically the result of parental maltreatment or neglect (Zayed & Harker, 2015). Among a sample of adjudicated youth, those who have experienced child welfare intervention were likely to



present risk profiles that were more concerning than young offenders never placed in care (Corrado et al., 2011; Cutuli et al., 2016). Perhaps due to the complexity of foster youth's risk factors, when compared to non-foster care youth, they had significantly worse outcomes with regard to criminal career parameters, including earlier ages of onset, a greater frequency of offences, and a greater amount of time spent incarcerated, further impeding their successful, prosocial transitions to adulthood (Yang et al., 2017). Given the importance and societal significance of this period of transition (e.g. Arnett, 2000) and the disadvantages that foster care youth would be hypothesized to have during this period (i.e. aging out of the system), it is particularly important to examine longitudinal patterns of crime into adulthood.

Ryan, Hernandez, and Herz (2007) examined offending trajectories among a sample of adolescent males aging out of the foster care system ( $n = 294$ ). Semi-parametric group based modeling (SPGM), an application of mixture modeling used to approximate trajectories across a sample (Nagin, 2005), was used to examine offending patterns between the ages of 16 to 22. Within their sample, Ryan et al. (2007) identified three developmental trajectories: nonoffenders, early onset desisters, and chronic offenders. Among this sample, 27% were categorized within the chronic offending trajectory, characterized by continued involvement in crime in adulthood. The proportion of foster care youth characterized by a chronic offending trajectory was substantially higher compared to the proportion of general samples of adolescents examined in trajectory studies (see Piquero, 2008 for a review). Yet, whether youth in care were disproportionately associated with chronic offending compared to a similarly high-risk offending group was not addressed, as the study did not include a comparison group. Furthermore, as this study was not specific to an offending population, even at their peak year, the trajectory of chronic offenders (27.3% of the sample) only averaged approximately 0.75 convictions. Compared to other trajectory studies, this is a relatively low rate of offending for a "chronic" trajectory group. In sum, foster care youth were identified as high-rate offenders, but what remained unclear was (a) whether their offending patterns actually differed from non-foster care youth and (b) whether foster care youth were disproportionately associated with a truly chronic offending trajectory.

Building upon the Ryan et al. (2007) study, Yang, McCuish, and Corrado (2017) included a comparison group of non-foster care youth. Using prospective longitudinal data from the Incarcerated Serious and Violent Young Offenders Study (ISVYOS), Yang

et al. (2017) found that within a sample of offenders adjudicated in adolescence ( $n = 364$ ), youth with a history of foster care placement were twice as likely to be categorized as continued chronic offenders in the periods of adolescence and emerging adulthood. In the study, continued chronic offending was defined as having accrued ten or more convictions in adolescence (ages 12 – 17) and seven or more convictions in emerging adulthood (ages 18 – 23), representing a high level of, and relatively persistent involvement in crime across these two periods. Among the foster care group, 32.2% were categorized as continued chronic offenders, as compared to 16.1% of the comparison group. Based on these findings, it appears that foster care placement is in some way related to a long-term chronic pattern of offending. However, much remains to be explained regarding the nature of this relationship. What remains especially unclear is whether foster care placement has an independent and direct effect on later offending, or whether the relationship between foster care and adult offending is more indirect, affected by moderating variables. Put differently, research has not yet addressed whether children and youth that enter foster care are characterized by an underlying propensity for criminal behaviour that persists through adulthood or whether persons that enter foster care emerge from this environment in adulthood with a host of negative life experiences and outcomes that are responsible for why such individuals persist in their criminal behaviour over the life course.

Empirical research that may provide explanatory insight on the foster care-offending relationship can be categorized into two general lines of reasoning: 1) foster care as representing a risk marker for an underlying propensity for criminal behaviour, and 2) foster care placement acting as a catalyst for the accumulation of negative outcomes/risk factors for offending. Alternatively, others may argue that foster care will not impact the experience of desistance from crime in adulthood (e.g., Sampson & Laub, 2005). Each of these hypotheses will be reviewed in the following section.

### **2.2.1. Foster Care as a Risk Marker: Early Adverse Experiences**

Given that the negative consequences of familial breakdown are widely recognized, placement in foster care is justified only when the benefits of removal of the child are considered greater than the harms. A comprehensive study of children in care in England found that only 5% of children entered foster care due to their own behavioural problems or disability whereas 61% had entered due to abuse or neglect

(Zayed & Harker, 2015). This means that youth placed in foster care experienced at least one substantiated form of serious maltreatment or family instability, indicating a complex history of polyvictimization and adverse childhood experiences. The literature has long identified both the immediate negative outcomes associated with child maltreatment, as well as the implications these experiences have over the life course, particularly in the context of criminal behaviour (see Malvaso et al., 2018 for a review). Although the area of research intersecting foster care and offending is still relatively small, there is a large body of literature that has examined the maltreatment-offending association. Given the disproportionately high experiences of maltreatment for foster care children, the maltreatment literature may provide valuable insight in better understanding the relationship between foster care and offending outcomes.

### ***Child maltreatment***

Experiences of childhood maltreatment such as abuse and neglect have been linked to later commission of serious and violent offences (McCord, 1983; Stouthamer-Loeber, Loeber, Homish, & Wei, 2001; Widom, 1989), an earlier age of onset of offending (Barrett, Katsiyannis, Zhang, & Zhang, 2014; Dannerbeck & Yan, 2011), and a greater number of arrests in both adolescence and adulthood (Maxfield & Widom, 1996; Ryan & Testa, 2005). Given the prevalence of a history of maltreatment among youth in care, these youth are at an elevated state of vulnerability even prior to their entry into the child welfare system. Although recent research suggests that positive family attachments can make youth more resilient to the negative outcomes in adulthood resulting from early experiences of maltreatment (Kuper & Turanovic, 2019), youth in foster care are greatly disadvantaged in this aspect as these types of positive familial supports may not be readily available for them; or, even more concerning, such supports may be negative and in fact enhance an already heightened risk for offending.

While not specific to foster care youth, Baglivio, Wolff, Piquero, and Epps (2015) examined the relationship between adverse childhood experiences (ACE) and offending trajectories between ages 7 to 17. Using a sample of 64,000 juvenile offenders in Florida, they found that a higher number of ACEs was predictive of more chronic patterns of offending. Specifically, the ACE measure predicted the early onset trajectory, representing only 7% of the sample, but accumulating an average of 18 arrests. Also using the ACE measure as an indicator of childhood trauma, abuse, and neglect, Fox,

Perez, Cass, Baglivio, and Epps (2015) found that each additional item on the ACE score resulted in an increased likelihood of being a serious, violent and chronic offender (as defined in the study as a juvenile offender with three or more felony referrals, wherein at least one of these was for a violent offense) by a factor of 1.35, as compared to the non-violent 'one-and-done' comparison group. Although these studies were limited to a period of adolescence, and not necessarily specific to foster care placement, they provided valuable insight on the closely related maltreatment-offender relationship.

Trauma related to maltreatment is also correlated with other negative outcomes such as mental health issues, substance abuse problems, and difficulties in school - all of which have prevailing effects in adulthood, and are implicated in long-term offending outcomes (Anda, Butchart, Felitti, & Brown, 2010; Bellis, Lowey, Leckenby, Hughes, & Harrison, 2014; Corrado et al., 2011). In a 40-year longitudinal study, McCord (1983) found that among those in the sample that had been abused or neglected in childhood, nearly half (45%) had been convicted for serious crimes, suffered from mental illness or alcoholism, or had experienced an early death. Another longitudinal study involved over nine hundred children in Indianapolis who were abused or neglected before the age of 11 and were compared to a matched control group (Maxfield & Widom, 1996). A 20-year follow up showed that the group of children who were abused or neglected were significantly more likely to be arrested in adolescence and in adulthood, even after controlling for demographic factors. Nearly half of those who were victimized were later arrested for a non-traffic offence. This confirmed previous findings of an association between early maltreatment and later delinquency (Smith & Thornberry, 1995). More recently, a prospective longitudinal study on youth in Oregon found that child maltreatment predicted later arrests for violent crimes even after controlling for unskilled parental discipline, academic performance, and delinquent peers (Bank & Burraston, 2001). The abovementioned studies, taken together, suggest that unmet needs related to maltreatment trauma while under government care may at least in part explain the complex relationship between foster care, maltreatment, and risk for future offending.

In addition, there are also experiences that are unique to placement in care that may exacerbate risk profiles of these youth that may then influence later offending. For example, foster care inevitably involves further trauma of removal from the biological family, residential mobility due to multiple placements, and sometimes, further victimization within the foster home (Cutuli et al., 2016). Studies that compare similarly

maltreated youth who were either placed in foster care or remained in the home (e.g. Doyle, 2008; Lawrence, Carlson & Egeland, 2006) lend support to the notion that that foster care placement contributes an independent effect on negative psychosocial outcomes, suggesting influence beyond that of the pre-existing maltreatment-offending association.

### **2.2.2. Foster Care as a Catalyst: Negative Outcomes**

Once youth are involved in both the child welfare and criminal justice systems, negative psychosocial outcomes related to these youth may then prolong their entrenchment in criminal behaviour throughout the life course. Along this line of analysis, foster care placement can be seen to represent an accumulation of risk factors. As demonstrated in the literature, the relationship between foster care and offending is complex and interwoven with experiences of trauma, which can result in developmental deficits and impact the socioemotional experiences of such youth throughout the life span. In support of this, it has been found that adolescents with a history of foster care placement are disproportionately more likely to be diagnosed with substance-related disorders and to attempt suicide as compared to non-foster care adolescents (Pilowsky & Wu, 2006; Vaughn, Ollie, McMillen, Scott, & Munson, 2007). Among a more specific sample of homeless adults with mental illness in Vancouver, a history of foster care placement was found to be an independent predictor of occupational instability, the presence of multiple mental disorders, early initiation of substance use, and substance dependence (Patterson, Moniruzzaman, & Somers, 2015). The following sections will provide a review of some of the negative outcomes associated with care placement that are theoretically relevant to offending.

#### ***Substance use***

Generally, research has identified a higher prevalence of substance use among foster care youth compared to their peers (Jackson & Simon, 2005; McCrystal, Percy, & Higgins, 2008; Vaughn et al., 2007; Ward, Henderson, & Pearson, 2003). Youth with a history of placement in foster care are significantly more likely to engage in alcohol and drug use compared to their non-foster care peers and are especially more likely to be diagnosed with substance use disorders (see Braciszewski & Stout, 2012 for a review). Other studies have also shown that substance use is not only more prevalent, but more

problematic among foster care youth. For example, using a sample of 19,430 American adolescents (ages 12 – 17), youth who reported a history of foster care placement ( $n = 464$ ) were nearly five times more likely to have been diagnosed with a substance dependence disorder in the previous 12 months (Pilowsky & Wu, 2006). In a sample of homeless young adults in New York, those with histories of foster care were nine times more likely to have been in drug treatment than their non-foster care counterparts, even after controlling for demographic factors, other adverse childhood events, past criminal behaviour, unemployment, and educational attainment (Thompson & Hasin, 2011). As substance use typically escalates during the transition into early adulthood, and can be exacerbated by adverse life events (Brown et al., 2008), it is particularly relevant to the study of youth in care, who are more likely to experience such negative events, including involvement with the criminal justice system.

The relationship between foster care and substance use is important because, generally, there is also a relationship between substance use and criminal behaviour (see White & Gorman, 2000 for a review), including a more violent and serious criminal careers (DeLisi, Vaughn, Salas-Wright, & Jennings, 2015; Farrington, Loeber, Stallings, & Homish, 2012). As summarized by Bennett, Holloway, and Farrington (2008), three types of hypotheses have been proposed to explain the substance use-crime relationship: 1) a direct causal effect (crime causes substance use, or substance use causes crime); 2) indirect cause (a third variable is responsible for both substance use and crime); and 3) non-causal (the relationship between crime and substance use is spurious, and is the result of a broader deviant lifestyle). When considering the case of crossover youth, the second category of explanations appears to have more merit, given that both adolescent offenders and foster care youth are youth who have multi-faceted risk profiles that could make them more susceptible to engaging in substance use (Corrado, 2002; Corrado et al., 2011). Thus, a consideration of these peripheral risk factors may provide further insight into the initiation of substance use as it is connected to other concerning childhood and adolescent outcomes that are relevant to both criminal behaviour and foster care placement.

For example, Windle and Windle (1996) proposed a self-medication hypothesis, suggesting that substance use could be a means of coping with adverse experiences (i.e. foster care). Indeed, among a sample of 210 foster care youth, Gabrielli, Jackson, Huffhines, and Stone (2018) found that greater severity and chronicity of maltreatment

was associated with greater levels of problematic substance use (as measured by the number of types of substances used, the frequency of use, and the age of initiation, and total CRAFFT<sup>2</sup> score). Substance use to cope with adverse experiences may then serve as a catalyst for further negative life events and initiate a cycle of antisocial behaviour – which is particularly concerning for crossover youth. Thus, the relationship between foster care and offending may be in part influenced by problematic substance use.

In general, Thompson & Auslander (2007) identified that the strongest risk factors associated with substance use were peers who also engaged in substance use and skipping school. As will be discussed in the following section, due to the number of school changes related to multiple foster care placements, foster care youth are likely to be more vulnerable with regard to having negative peer associations and weak attachments to school. Based on the extant literature, it is evident that the relationships between foster care, substance use, adverse childhood experiences and involvement in crime are interrelated – yet most studies do not explore beyond direct relationships.

### ***Gang involvement***

Although not explicitly examined in the literature, youth in foster care may be more susceptible to involvement in gangs, which could then heighten their risk of becoming seriously entrenched in crime. Indeed, negative peer groups such as gangs may increase criminal values and behaviours resulting in both a greater frequency of offending (Gatti, Tremblay, Vitaro, & McDuff, 2005; Thornberry, Lizotte, Krohn, Smith, & Porter, 2003), and greater seriousness of offenses committed (e.g. aggravated assault, homicide; see Howell, 1999). Despite the general consensus in the literature regarding the robust relationship between delinquent peer groups and individual delinquency, what remains contested are the mechanisms by which one influences the other. Thornberry, Krohn, Lizotte, and Chard-Wierschem (1993) examined three mechanisms that could account for the influence of gang membership on delinquency. The selection model suggests that individuals with a pre-existing criminal propensity are more likely to become involved in gangs, rendering the gang-crime relationship to be spurious. The facilitation model suggests that gang membership plays a causal role in delinquent behaviour, whereby gang association itself facilitates crime. Lastly, the enhancement

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<sup>2</sup> A 6-item questionnaire related to problematic substance use (Knight, Sherritt, Shrier, Harris, & Chang, 2002).

model refers to an interplay of both selection and facilitation processes, positing that youth who tend to join gangs already have criminal tendencies, and joining the gang exacerbates these criminal behaviours. The last of these three explanations is most fitting in relation to the current population of interest. Since foster care youth are already at a greater risk of being involved in crime, they may also be more likely to develop social bonds with antisocial peers based on mutual delinquency. The influence of negative peer groups may also be amplified among this group, as foster care youth have likely experienced frequently disrupted relationships with alternative sources of social support (Courtney & Heuring, 2005).

Conceptually, the accumulation of risk factors among foster care youth such as family dysfunction (Baglivio et al., 2016; De La Rue & Espelage, 2014), strained social ties (Courtney & Heuring, 2005; Perry, 2006), and residential mobility related to multiple placements in care (Alltucker et al., 2006) may result in an increased susceptibility for involvement in a gang (Corcoran, Washington, & Meyers, 2005). High levels of family conflict have also been associated with substance use issues, delinquency, violence, and gang involvement (Hill, Howell, Hawkins, & Battin-Pearson, 1999), and several prospective longitudinal studies have identified low attachment to parents as a risk factor for gang membership (Eitle, Gunkel, & Van Gundy, 2004; Howell & Egley, 2005; Thornberry, Krohn, Lizotte, Smith, & Tobin, 2003). Due to resultant deficits in social capital, foster care youth may then seek to fill this gap through the adoption of 'surrogate families' among peers (Eitle et al., 2004). Despite the conceptual link between foster care and gang involvement, there is a lack of research on this specific intersection. A limited number of studies have identified the iatrogenic effects of the child welfare system – specifically, group homes. In other words, compared to family-based or treatment-based foster homes, group homes are likely to create denser networks of at-risk youth, with relatively fewer prosocial youth to model positive behaviour, which may account for the comparatively higher rates of delinquency among youth in group homes (Ryan, Marshall, Herz, & Hernandez, 2008).

Recognizing the need for research on deviant peer groups among foster care youth, Shook, Vaughn, Litschge, Kolivoski, and Schelbe (2009) examined the heterogeneity of deviant peer affiliations in a sample of 404 youth aging out of the child welfare system in Missouri. A majority of these youth were reported as belonging to a latent class profile of "moderate" ( $n = 236$ ) or "high" ( $n = 55$ ) deviant peer associations,



with roughly a quarter ( $n=112$ ) of these youth belonging to the “low” subgroup. These profiles were constructed based on questions asking each youth how many friends they had that: were 2-3 years older, were not in school, drank alcohol more than once a week, used marijuana/other drugs, were in trouble with the police, had children, ran away from home, failed classes/repeated grades, and had physical fights with others. Youth with a moderate deviant peer affiliation profile reported that at least half of their friends had gotten into physical fights with others, and few of them had been in trouble with the police (as compared to youth in the low group whose mean responses for both questions were close to 0). Youth exhibiting the high deviant peer affiliation profile reported that most of their friends had physical fights with others, and that more than half of their friends were in trouble with the police. Although not specific to gang involvement nor to an offending population, comparisons across latent classes showed that youth in the high deviant peer association group were significantly more likely to exhibit delinquent behaviour, including: being arrested, selling drugs, making money illegally, and assaulting someone with a weapon – which theoretically, could be linked to gang activity. Like other studies of foster care youth, the lack of a comparison group implied that it was not possible to examine whether the prevalence of foster care in these two higher-risk deviant peer affiliation classes was disproportionately higher compared to non-foster care youth.

Chapple, Tyler, and Bersani (2005) found that the relationship between child maltreatment and delinquency in later life was mediated by experiencing rejection by conventional peers. Thus, for foster care youth who are victims of child maltreatment, it may be more difficult to maintain prosocial relationships, making them more vulnerable to involvement in antisocial peer groups, which in turn may result in foster care youth being disproportionately found among adolescent gang members. Using a sample of 177 gang members in Hong Kong, Chui and Khatani (2018) also found support for the mediating role of gang membership in the relationship between child maltreatment and delinquency. Gang involvement may be particularly appealing to victims of child maltreatment, a group that again is going to include a disproportionate number of foster care youth, because of the family-like functions that they provide such as resources, protection, and sense of camaraderie (Moule, Decker, & Pyrooz, 2013), which may have been absent in their lives, particularly if they have experienced turbulent home lives (Vigil, 1988).

The literature presented above suggests that youth in foster care may be more susceptible to involvement in gangs. In sum, in accordance with the principle of homophily, foster care youth who are already at risk of involvement in crime may seek delinquent peer groups who share similar criminal interests, further embedding them into criminal lifestyles. Once youth in foster care also become gang-involved, this may then compound with more gang-specific risks, such as intergroup conflict and violence (Peterson, Taylor, & Esbensen, 2004). Consequently, youth in foster care who become involved in gangs may be at a substantially greater risk for involvement in serious and violent crime. Given both the financial and societal costs of such criminally-entrenched youth (see Cohen, Piquero, & Jennings, 2010), it is surprising that the specific interaction between foster care placement and gang membership has yet to be empirically examined.

### ***Negative self-identity***

For youth who are dually institutionalized in both the child welfare and criminal justice systems, the role of self-identity may be of particular importance when examining their continued involvement in crime during a period where desistance is the norm (i.e. the transition from adolescence to adulthood). It has been long asserted that the way in which an individual views themselves influences - or at the very least is consistent with - their attitudes and behaviours (Burke, 1980; Gove, 1980; Matsueda, 1992; Paternoster & Bushway, 2008). Traditional labelling theories (e.g. Lemert 1951; Tittle, 1980) have examined the role of external institutions or authorities conferring labels on individuals such as criminal, or mentally ill, and contend that those who internalize these negative labels will act accordingly. In other words, those who view themselves as criminal are more likely to engage in behaviour that is criminal. Incorporating more of a rational-choice standpoint, Schneider (1990) posited that youth who had positive self-identities as honest, law-abiding citizens are less likely to recognize criminal opportunities when they arise. Conversely, she argued that youth who adopted negative identities of themselves as lawbreakers were more likely to seek out criminal opportunities as well as recognize the costs, benefits, and risks of criminal opportunities when they occur. And indeed, in many lines of criminological research, identity is thought to play an instrumental role in the onset, persistence, and desistance from offending (Asencio & Burke, 2011; Brownfield & Thompson, 2005; Lemert, 1951; McCuish, Lussier, & Corrado, 2018; Rocque, Posick, & Paternoster, 2016).

Research examining the role of self-identity among foster care youth is limited. In a qualitative study of 17 adolescents who had spent at least two years in foster care, Kools (1997) found that foster care negatively impacted identity development. More specifically, the institutionalization aspect of the foster care experience and the stigma surrounding the label of “foster child” resulted in youth reporting low self-esteem, social isolation, and stigmatized self-identities, among other negative consequences. Although narrower in scope within identity research, the closely related concept of self-esteem (the negative or positive appraisals of self and self-worth; e.g. Kuper & Turanovic, 2019), is also worthy of discussion given its inverse relationship to crime and delinquency (see Mier & Ladny, 2018 for a meta-analysis). Using a sample of preschool children followed into adulthood ( $n = 357$ ; mean age 36 at follow up), Herrenkohl, Klika, Herrenkohl, Russo, and Dee (2012) found that involvement with child welfare services for abuse or neglect was associated with lower self-esteem in adulthood. Kuper and Turanovic (2019) also highlighted the empirical link between childhood maltreatment and adverse psychosocial outcomes in adulthood such as depressive symptoms and low self-esteem. More importantly however, Kuper and Turanovic (2019) found that strong attachments to family in adolescence could act as a protective factor in this relationship, thereby partially mitigating the abovementioned impact of childhood maltreatment. Given these findings, foster care youth may be at a marked disadvantage compared to youth who have never been placed in care, as they would be theoretically less likely to be able to develop or maintain strong attachments to their biological families. Thus, whether or not self-identity plays a role in the relationship between foster care placement and patterns of offending is worthy of scholarly attention.

### **2.3. Situating the Foster Care-Offending Association in Theory**

The abovementioned research illustrates the complexity of the relationships between adverse childhood experiences, foster care placement, negative psychosocial outcomes, and criminal behaviour. Although many studies examined the correlation between foster care placement and criminal justice involvement, there remains a dearth of theoretically-informed empirical research on the impact of foster care placement and longer-term offending patterns. One exception is Corrado and Freedman’s (2011) proposal that foster care is a major “stepping stone” in a pathway to serious antisocial

behaviour. What remains unclear still, is whether this is the result of individuals entering foster care with an underlying propensity for criminal behaviour or whether youth in foster care are at a higher risk of engaging in criminal behaviour because the foster care experiences exposes them to a greater number of risk factors (e.g., gang involvement, substance use, negative identity) that in turn influence their involvement in criminal behaviour. The examination of these two different pathways can be organized by framing them within related theories (Wikström, 2006). With regard to risk factors that impact the life course, theories under the developmental life-course paradigm can offer causal explanations of crime rather than merely identifying correlates. Some key theories under the framework of developmental life-course criminology (DLC) will be discussed in the following section.

## Chapter 3.

### Developmental Life-Course Criminology

Criminological theory is often guided by clear empirical patterns that have emerged and have held true across samples and over time. Some of the most widely accepted and repeatedly found phenomena include the relationship between early onset and persistent offending, the stability of antisocial behaviour over time, the importance of family influences and offending, and the relationship between age and crime (Sampson & Laub, 1993; Wolfgang, 1983). The age-crime curve refers to the finding that the aggregate crime rate peaks in the teen years and then gradually declines in adulthood (Blumstein, Cohen, & Farrington, 1988; Thornberry, 1997; Steffensmeier, Allan, Harer, & Streifel, 1989). Although there is relative stability in childhood antisocial behaviour and later criminality (Olweus, 1979), a widely accepted paradox is that "...adult antisocial behaviour virtually requires childhood antisocial behaviour, yet most antisocial children do not become antisocial adults" (Robins, 1978, p. 611). Therefore, not only must theories explain the stability of criminal behaviour, but also changes that occur for some individuals but not others.

Developmental life-course criminology (DLC) is an overarching paradigm, representing research concerned with the study of offending over the life course – that is, the onset, persistence, and desistance of offending, and the factors that influence these parameters (Kazemian, Farrington, & Piquero, 2019). Its origins can be traced back to the re-emergence of longitudinal studies of crime in the 1970s and the advent of the criminal career paradigm, which can now be considered to be subsumed under the DLC framework (Farrington, 2003). Drawing from the seminal work of Wolfgang, Figlio, and Sellin's (1972) *Delinquency in a Birth Cohort*, which found that a small minority of juvenile offenders accounted for a disproportionate amount of crime, the criminal career paradigm rose to prominence with the establishment of a National Academy of Sciences Panel on Criminal Careers (hereafter referred to as 'the Panel'; Blumstein, Cohen, Roth, & Visher, 1986). In this sense, a criminal career refers to the "longitudinal sequence of crimes committed by an individual offender (Blumstein et al., 1986, p.12). Following the development of the abovementioned Panel, three influential longitudinal studies known as the Causes and Correlates studies were launched by the Office of Juvenile Justice

and Delinquency Prevention (OJJDP) to identify risk and protective factors related to offending. Although atheoretical in nature, criminal career research has raised theoretical questions regarding patterns of crime over throughout the life course. Thus, several DLC theories arose following the creation of the Panel (see Farrington, 2005), each with different emphases in examining not only the development of antisocial behaviour, but also risk factors at different ages, and the effects of life events on the course of development (Farrington, 2003).

The current thesis uses the criminal career framework to organize research on foster care placement and offending over the life course. For the purposes of this thesis, three categories of DLC theories will be discussed: propensity, developmental, and life course. Propensity theories posit static explanations of criminal behaviour, wherein time-stable differences between individuals are thought to account for differences in offending patterns (Lahey & Waldman, 2003; Wilson & Herrnstein, 1985). Life course theories are typically more sociological in nature, examining social structure, and the effects of life events and transitions on offending, with specific focus on turning points in the process of desistance (Sampson & Laub, 1993). Developmental theories are more psychological in nature and focus more on individual-level factors that influence future offending. The next sections will provide an overview of each of these three categories of theories within the DLC framework and how these theoretical frameworks explicate the relationship between foster care and offending.

### **3.1. Propensity Theories**

The propensity category of theories encompasses those that examine time-stable determinants of crime. In Nagin and Paternoster's (2000) conceptualization, this is in line with population heterogeneity explanations of criminal behaviour. Aptly named, population heterogeneity refers to how individual-level factors established early on in life (i.e. propensities, dispositions; Wilson & Herrnstein, 1985) create different types of persons (Nagin & Paternoster, 1993). Thus, an explanation of population heterogeneity attributes stability in offending over time to differences in an antisocial propensity established early on in life, which then remains relatively stable over time. Between-individual differences in this propensity are hypothesized to explain a positive relationship between past and future criminal behaviours. Although there may be "reverberations," or slight within-individual changes over time, these are not thought to

change the rank-order between persons (Nagin & Paternoster, 2000, p.119). Thus, according to propensity theories, antisocial behaviour and criminal behaviour are fully explained by an underlying criminal propensity. The relationship between past and future offending is spurious once accounting for this propensity. Moreover, although negative life events may also be related to offending, this relationship would be hypothesized to exist solely because antisocial propensity causes both criminal behaviour and these negative life events.

Theories under the propensity branch of DLC differ with regard to which trait is considered to constitute this propensity. The most prominent of these proposed traits are: low self control (Gottfredson & Hirschi, 1990), temperament/personality (the dimensions of constraint and negative emotionality; Caspi et al., 1994; Lahey & Waldman, 2003), and psychopathy (more specifically, its primary trait of impulsivity; Cleckley, 1976; DeLisi, 2016). Regardless of which trait is emphasized in these theories, they share the common assumption that “any observed correlation between past and future criminal offending is due to enduring differences between individuals in an initial proneness or propensity to commit crime” (Nagin & Paternoster, 2000, p.124).

If propensity theories were to assume that foster care captured, or at least was a proxy for, an underlying criminal propensity, they would suggest that there was a direct effect of foster care on continued offending. Other criminogenic risk factors that follow foster care placement would be seen as the direct result of placement in care and therefore would be ultimately inconsequential in the development of criminal behaviour. Therefore, instead of a history of foster care placement being moderated by a range of other negative outcomes experienced as a consequence of this placement (e.g., negative self identity, substance use, gang involvement), individuals that enter the foster care system would be seen to be characterized by an underlying propensity for criminal behaviour that will have a direct impact on criminal behaviour over the life course. Foster care placement may also be seen as an important proxy for capturing neuropsychological impairments given that youth in foster care are disproportionately more likely to have histories of adverse childhood experiences and subsequently more likely to have deficits in cognition and executive functioning (e.g. McLaughlin, Sheridan, Tibu, Fox, Zeanah, & Nelson, 2015; Sheridan, Peverill, Finn & McLaughlin, 2017). In this sense, foster care placement would be seen to constitute a time-invariant risk factor

indicating a type of offender that is more prone to a serious offending trajectory, as compared to non-foster care offenders.

### **3.2. Developmental Theories**

The hallmark of developmental theories is the recognition that within-individual changes in antisocial behaviour are related to age in an orderly way (Loeber & Le Blanc, 1990; Patterson & Yoerger, 1993; Thornberry, 1997). Consequently, developmental theorists believe that within-individual change is predictable across the life course, and that both static (e.g. population heterogeneity; Nagin & Paternoster, 2000) and dynamic (e.g. state dependence) processes are at play in the association of past to future offending (Blokland & Nieuwbeerta, 2010). In order to account for both between-individual differences and within-individual changes in patterns of offending, LeBlanc and Loeber (1998) proposed that offenders exhibiting different patterns of offending had distinct developmental trajectories with their own causal origins.

Based on data from the Dunedin Multidisciplinary Health and Development Study, Moffitt's (1993, 1997) dual taxonomy is one theory that differentiates two etiological routes to crime. Rather than a strictly static perspective, Moffitt's (1993, 1997) developmental taxonomy represented both static and dynamic perspectives by arguing that some offenders remained stable in their offending over the life course (life-course persistent; LCP) and some offenders desisted in adulthood (adolescence-limited; AL). Thus, in this theory, the age-crime curve is disaggregated into LCP and AL trajectories, each originating from different causal pathways. LCP offenders represent the small minority of juvenile offenders that are responsible for the majority of crime, continuing to offend into adulthood. Whereas AL offenders, making up the majority of all juvenile offenders, were context-specific in their offending, which was confined to adolescence.

Moffitt (1993) hypothesized that the onset of an LCP offending trajectory is the result of the interaction between neuropsychological deficits and negative early experiences such as family adversity (e.g. poor parenting, family dysfunction, and poverty). Due to the persistent effects of neuropsychological impairment, life-course offenders would be more likely to engage in social conflicts with authority figures, leading to "cumulative continuity." The concept of cumulative continuity referred to the process wherein social conflicts in childhood tended to perpetuate later antisocial behaviour and



eventually, a variety of criminal offences persisting throughout the lifespan. In contrast, AL offenders were purported to offend because although they had reached biological maturity in adolescence, they lacked the means to achieve adult rewards. Therefore, the primary motivations for offending for AL offenders were material gain, rebellion, or peer influence, especially from older LCP offenders. Consequently, AL offenders desisted from offending when they entered adulthood and bridged the maturity gap, which allowed them to achieve their desired goals through legitimate means. LCP offenders however, cannot simply mature out of the pervasive effects of their neuropsychological deficits combined with adverse family experiences. Instead, the interaction between these factors leads to continued negative experiences and the accumulation of deficits (i.e., cumulative continuity) that influenced the stability of criminal behaviour in adulthood. Although later in-depth studies (Piquero et al., 2007; Thornberry & Krohn, 2005) of offending trajectories revealed more diversity in offending careers than implied by Moffitt's (1993) two trajectories, the developmental taxonomy was at the forefront of the paradigm shift into the DLC perspective.

Given that youth in foster care are more likely to engage in crime, among this group of foster care offenders, it is necessary to determine which factors, if any, influence the seriousness and duration of their involvement in crime. Borrowing from the central element in Moffitt's (1993) etiology of LCP offenders (i.e. the interaction between neuropsychological deficits and family adversity), this explanatory framework can be applied to the foster care-offending association. Specifically, from a developmental standpoint, foster care would be seen as an interacting factor in conjunction with other individual-level risk factors (e.g. substance use, child maltreatment, gang involvement) in explaining the continuity of offending. Using the concept of cumulative continuity, youth in care will be more likely to accrue other types of disadvantage as examined in Chapter 2.

Lending support for this perspective is the growing body of research suggesting a link between experiences of childhood trauma and neurological deficits (Kuper & Turanovic, 2019; McLaughlin et al., 2015; Petersen et al., 2014). Recently, using a community-based sample of youth ( $n = 9,498$ ), Gur et al., (2019) found that traumatic stressful events impacted both the structure and function of the brain and accelerated brain maturation. Furthermore, individuals in the sample who had experienced traumatic events were also characterized by a greater severity of symptoms across a number of

psychopathological domains including anxiety, depression, psychosis, and these effects were most pronounced for externalizing behaviour (Gur et al., 2019). Thus, the interaction between foster care and childhood maltreatment may be seen to better account for the foster care-offending relationship rather than foster care itself exerting a direct effect on offending. Along similar lines, the interaction between foster care placement and gang involvement is also worthy of examination then, as this could represent the interrelated relationship between neuropsychological deficits and gang involvement as a negative risk factor for offending (i.e. the relationship between foster care and a high level of offending is due to the disproportionate likelihood of foster care youth having enduring neuropsychological deficits combined with the influence of antisocial peer groups). Similar assertions could be made about negative self identity (i.e. negative self identity among foster care youth influences frequency of offending), and substances use (i.e. foster care youth's substance use interact with the foster care effect to result in greater involvement in crime). In sum, measurement beyond direct effects is warranted in order to examine the moderating effects of individual-level risk factors on the foster care-offending relationship.

### **3.3. Life-Course Theories**

Similar to developmental theories of crime, life-course theories also attempt to account for both continuity and change in criminal behaviour. However, departing from the developmental focus on the etiology of criminal pathways, life-course theories place an emphasis on the process of turning points in the life course. Using Nagin and Paternoster's (2000) conceptualization, life-course theories represent state dependence perspectives, in which the stability of crime is attributed to a process of "contagion," where a criminal act can have causal effects on subsequent criminality through the weakening of constraints, and the strengthening of incentives to commit crime. Thus, a life event can have causal implications for the probability of subsequent behaviours. This allows for the ability to account for both continuity and change in criminal behaviour, as engagement in prosocial behaviours can then increase the potential for future positive behaviours.

Sampson and Laub (1993) viewed that within-individual change initiated by structurally-induced turning points in the life course were essential to life course criminology. They viewed crime as the result of both persistent between-individual

differences in proclivity toward antisocial behaviour as well as external events in the life course. Furthermore, Laub and Sampson (1993) argued that prior delinquency has a causal effect on adult crime through a process that integrates state dependence effects and cumulative continuity. The cumulative continuity of disadvantage describes a process where past criminal behaviour can erode conventional bonds to society which then weakens inhibitions and restraints on crime. Criminal behaviour at one point in time is seen to systematically diminish social and institutional bonds that link adults to society. Sampson and Laub (1993) also acknowledged that life circumstances can be improved with prosocial behaviours, and early risk factors can be overcome through positive turning points. Involvement in positive prosocial roles such as marriage, employment, and parenthood can constitute these types of turning points, by creating interdependent, reciprocal relationships of mutual investment embedded within social relationships (Coleman, 1988). Opposing views (i.e., Gottfredson & Hirschi, 1986) argued that positive adult social bonds were a matter of self-selection, wherein the quality of relationships in later life were manifestations of the individual's stable level of self-control. However, Sampson and Laub (1997) countered that there were external social mechanisms occurring simultaneously with self-selection effects. Although individual differences influenced the choices that an offender makes, there were also interacting social effects occurring because of these choices, which unlike previous static perspectives, allowed for the possibility of within-individual change.

In Laub and Sampson's (2003, 2005) later works, they extended the Glueck's study by following the sample up to age 70 and attempted to identify which childhood and adolescent risk factors predicted a chronic and high rate of offending over the life course. Although a range of different factors were examined, including IQ, temperament, parental qualities, family adversity, and so on, using both retrospective and prospective analytic strategies, Sampson and Laub failed to identify any childhood or adolescent risk factors that provided meaningful information about a person's criminal trajectory over the life course. In effect, Sampson and Laub questioned the value of propensity and developmental theories as it seemed that there was too much random variation over the life course and thus individual-level risk factors early on in the life course could not predict what would unfold over the decades to come. They instead acknowledged the subjective role of human agency; the principle that human beings were active participants in their lives (Laub, 2006). This introduced a random element into turning

points, as individuals could simply be choosing to continue engaging in crime, or actively choosing to desist, rather than life changes occurring in an orderly manner. Human agency was used to account for some of the variability and unpredictability in long-term outcomes, as the interaction between individuals and the environment resulted in developmental noise that was often unpredictable. Regardless of turning points however, it was purported in this later iteration that all offenders eventually desisted with age either due to structural changes in social roles, or due to human agency.

In relation to foster care experiences, this suggests that although placement in foster care itself may have a modest effect on later criminality, it is plausible that at the point of placement, it may be the cumulative impact of other risks (trauma, abuse, neglect, which have subsequent disadvantaging effects pertaining to educational attainment, mental health, etc.) which leads to increased levels of criminality. Therefore, this accumulation of disadvantage may support stability in criminal behaviour throughout the life course. Unlike a heterogeneity-based perspective, events and experiences later in life are seen to influence subsequent behaviours. And unlike a developmental perspective, early childhood factors such as foster care were not thought to influence offending patterns in adulthood. In contrast with the life-course perspective that all offenders are provided with the same opportunities to desist, adults with a history of foster care may be comparatively limited in their ability to obtain stable employment in adulthood, or maintain prosocial relationships, particularly during the transitional period of emerging adulthood. Considering the discrepancies between life-course theories and what has been empirically found in the foster care literature, it is necessary to keep in mind the data which formed the foundation on which Sampson and Laub (1993; and later, Laub and Sampson, 2003) formulated their theory. The first wave of data collection for Glueck and Glueck's (1950, 1952) Unraveling Juvenile Delinquency Study began in 1940, and it is evident that the period in which these data were collected greatly shaped the tenets of life-course criminology, and also that a considerable amount of societal change has occurred since then. Among these major societal changes is the recognition that the transition to adulthood is less abrupt than once believed. This transition has been called, among other things, extended adolescence because of the recognition that entry into the types of adult social roles that Laub and Sampson (2003) considered a ubiquitous part of adulthood were occurring later and later in the life course.

### 3.3.1. Transition to Adulthood

Within the past couple of decades, the transition from adolescence to adulthood has dramatically shifted, lengthening into a period of emerging adulthood (Arnett, 2000). More recently, emerging adults have delayed their transitions into adult roles in unprecedented ways, spending more time pursuing higher education, prolonging residency in their parental homes, and postponing the formation of their own nuclear families (Avery & Freundlich, 2009). Milestones that were traditionally seen as markers of adulthood are now divorced from the legal demarcation of adulthood. Yet, child welfare legislation in North America still appears to sever social and financial supports for youth in care once they “age out” of the system at the age of majority and are expected to immediately become self-sufficient adults. Rather than a gradual process, youth in care experience dramatic and often unattainable shifts in expectations of autonomy. Thus, the transition into adulthood is particularly difficult for youth aging out of foster care, many of whom lack the psychosocial maturity and prosocial adult ties to succeed (Barth, 1990). This hypothesis is also supported by the literature illustrating the relationship between foster care placement and poor academic achievement (McCrae, Lee, Barth, & Rautkis, 2010). However, even when youth in care graduate with a high school diploma, they have less financial and emotional support than the general population of adolescents (Packard, Delgado, Fellmeth, & McCready, 2008). This is particularly of interest to studies of longer-term outcomes, as educational attainment is directly related to improved job prospects and financial stability (Huebner, 2005). The risk of unemployment is further amplified among offending groups, as incarceration significantly diminishes future employment opportunities (see Western, Kling, & Weiman, 2001).

Based on the presented literature, it appears that youth in care enter this transitional period of emerging adulthood with less than adequate social capital and are characterized by a high level of underlying risk that limits their ability to demonstrate the human agency required to experience a prosocial turning point. For the fraction of foster care youth who have also experienced contact with the juvenile justice system, their ability to transition into adult roles may be even more difficult and complicated, through interacting conditions of both types of institutionalization (Chung, Little, & Steinberg, 2014; Cutuli et al., 2016). Youth who are involved in both the criminal justice and child welfare systems are exposed to an accumulation of risk factors that may decrease the

likelihood of experiencing traditional opportunities to desist (Sampson & Laub, 1993), increasing their likelihood of continued involvement in offending in adulthood. The cascading effects of foster care placement and their cumulative impact as a barrier to desistence is in stark contrast with Laub and Sampson's (2005) later views that childhood risk factors cannot influence adult offending trajectories.

### **3.4. The Role of Theory in Research**

As Wikström (2006) proposed, the role of theory should be to frame causal processes, which is essential in designing effective interventions. The recent resurgence of prospective longitudinal research in the field of criminology has lent credence to the assertion that early childhood experiences have prevailing adverse effects throughout the life course. Thus, when examining the relationship between foster care and offending, a developmental perspective is necessary. Longitudinal research that is not informed by DLC perspectives risk falling into the same pitfalls of cross-sectional research, such as, studying differences in static factors between individuals (Sampson & Laub, 1997). Therefore, value of the insights offered by longitudinal research is contingent on whether it has been guided by a developmental perspective. Without taking the processes of development into consideration, longitudinal research cannot provide substantive insights about sequential changes in offending over time. To reach a comprehensive and accurate understanding of the causes of crime, it has been argued that only prospective longitudinal studies that are guided by the DLC paradigm can validly explain Robins' paradox (Farrington, 2003; Piquero et al., 2007). Given what is known about the nature of the relationship between placement in care and crime, and the complex roles of early childhood experiences and subsequent risk factors, it was necessary to take into consideration a DLC standpoint in the current study.

#### **3.4.1. Trajectory Research**

Generally, findings reflected in the literature are consistent with the role of foster care placement taking place within a state dependence process. A process of state dependence, while difficult to dispute theoretically, is subject to limitations when considering empirical validation, and there remain some methodological challenges. In

order to measure state dependence effects, statistical models must control for both observed and unobserved population heterogeneity (Nagin & Paternoster, 2000).

Semiparametric group-based modeling (SPGM) is a methodological technique first introduced by Nagin and Land (1993) that can take into account unobserved heterogeneity. In contrast with recidivism-based approaches, research employing the trajectory approach can differentiate between different patterns of offending within a sample, and also capture within-individual changes over time. This allows for an examination of different risk factors that may increase an individual's likelihood of being a chronic offender. SPGM clusters individuals into groups that follow similar developmental trajectories, but unlike cluster analysis, does not assume the existence of these groups. Rather, SPGM allows distinct developmental trajectory groups to emerge from the data through the use of finite mixture modeling, thus also providing the opportunity to identify previously unrecognized patterns of offending (Nagin & Piquero, 2010).

Despite the popularity of SPGM (see Nagin, 2005), its value as a methodological tool has been largely contested within the past two decades (e.g. Sampson, Laub, & Eggleston, 2004). For example, Sampson and Laub (2005) have questioned whether the use of this method has led to an improper focus on methodology over theory. However, Brame, Paternoster, & Piquero (2012) have argued that the SPGM method can be used in conjunction with theory, to test theoretical principles and empirical predictions arising from them. Given the above stated importance of theoretical framing in criminological research, SPGM was chosen as the primary outcome variable for the current thesis.

## **Chapter 4.**

### **Methods**

#### **4.1. Aims of the Current Study**

Given the overlap between foster care and offending, the aim of the current study was to further understand this relationship by examining the criminal trajectories of adjudicated youth who were prospectively followed into early adulthood. As demonstrated in the above sections, although there is general consensus that youth in foster care are disproportionately more likely to exhibit serious and chronic patterns of offending, the explanations of this association are equivocal. Much of this is due to the fact that most research thus far on crossover youth has been atheoretical in nature. DLC theories appear to provide intuitive frameworks upon which to organize research on this relationship, yet foster care was not directly examined in any of the theories discussed. The aim of the current study was not to test propensity, developmental, and life-course theories of offending, but rather to use these theories to guide research questions and interpret the findings. The current study sought to begin to tease apart the foster care-offending relationship by first examining the relationship between theoretically and empirically relevant risk factors and criminal offending trajectories, and second by examining the interactions among these risk factors in predicting offending trajectories.

#### **4.2. Sample**

Data for the current study were derived from the Incarcerated Serious and Violent Young Offender Study (ISVYOS), which was conducted in British Columbia, Canada and has been ongoing since 1998. The ISVYOS consists of two cohorts, one cohort of youth interviewed between 1998 and 2003 and a second cohort of youth interviewed between 2005 and 2011. In the structured interview conducted with participants, only Cohort II received questions specific to foster care placement and intrafamilial conflict. Thus, the current study focused on this subsample of adjudicated male ( $n = 557$ ) and female ( $n = 121$ ) adolescents, all of whom were interviewed in open and secure custody facilities within the Greater Vancouver Regional District and surrounding areas. Sentencing provisions set out in the YCJA (2002; see Appendix B)



ensure that only the most serious and violent offenders are sentenced to detention, therefore the sample is not representative of all adolescent offenders in British Columbia. Rather, it is representative of a subgroup of the most serious and violent adolescent offenders that have come into contact with the criminal justice system. Indeed, youth included in the sample were convicted of on average 10.40 offences (SD = 8.66) between age 12 and 17 and averaged about one year incarcerated during this same period (230.09 days; SD = 133.00). Descriptive information about the sample is presented in Table 4.1. The mean age at interview for the sample was 16.01 years (SD = 1.31). As is typical in all levels of justice system involvement in Canada, Indigenous Peoples were overrepresented in the current sample (31.9%;  $n = 216$ ), while only making up 6.6% of the general population in British Columbia (Statistics Canada, 2016). As this was a high-risk sample, a majority of youth (59.3%;  $n = 402$ ) reported a history of placement in foster care.

### **4.3. Procedure**

The purpose of the ISVYOS was to obtain information on risk factors associated with various parameters of the criminal career. Self-report interviews were conducted, and file-based information was collected on a sample of youth incarcerated in various centers throughout British Columbia. MCFD acts as the legal guardian to all youth in custody and their consent allowed the research team to ask incarcerated youth if they wished to participate in the study. Youth were eligible to participate in the study if each of the following criteria were met: (1) were English-speaking, (2) demonstrated an understanding of interview questions (e.g., had no noticeably severe learning disability), and (3) were willing to provide accurate information. Data concerning refusal rates were not collected during the entire course of the study, but in the time that such data were collected, approximately 5% of eligible youth refused to participate. Research assistants (RAs) interviewed participants in an isolated interview room to help ensure confidentiality. All participants were read and given a copy of an information sheet which explained the purpose of the study, how information would be collected (i.e., interview and file information), and that all information would be kept confidential unless the participant made a direct threat against themselves or someone else. To improve the reliability of self-reported information, RAs accessed case management files, which

contained presentence reports and other information, to help detect discrepancies between interview responses and official records.

## **4.4. Measures**

### **4.4.1. Measures of Offending**

Offending was measured using data using British Columbia Corrections' computerized system, Corrections Network (CORNET), which contains information pertaining to each offender's movement in and out of custody as well as the exact criminal offence, date of conviction, and sentence type. Using data from this computerized system, criminal convictions were coded for the entire sample from age 12 up to age 23. The start of the follow-up period, age 12, represented the minimum age of criminal responsibility in Canada. From that point on, every criminal charge that resulted in a conviction was coded. Convictions were categorized as violent, property, administrative, violation, weapon, miscellaneous, drug, and sexual. In the current study, violent offenses encompassed the following: assault, assault with a weapon, aggravated assault, manslaughter, and murder. Uttering threats was excluded from the definition of violence to avoid saturating this measure with relatively minor offenses. Although it was possible for offenders to commit new offences while outside of the province, the current study had access only to records of offences committed within the province of British Columbia. In line with previous research, (e.g. Eggleston, Laub, & Sampson, 2004; van der Geest, Blokland, & Bijleveld, 2009), if a youth in the sample moved out of province ( $n = 18, 1.8\%$ ) or died ( $n = 11, 1.6\%$ ), convictions measured after the date of death or movement were coded as missing rather than as zero. The average number of charges that resulted in conviction between ages 12 to 23 was 16.32 (SD = 10.33). The median number of convictions was 15, highlighting that the high mean number of convictions found was not an artifact of a small subgroup of individuals (i.e., chronic offenders). The average number of days spent in custody from the ages of 12 to 23 was 582.15 (SD = 522.00). Figure 4.1 displays the average number of convictions and the average number of months spent in custody at each age for males and females in the sample. Although the number of convictions resembles that of the age-crime curve, peaking in adolescence and declining rapidly in adulthood, time spent in custody for males remained relatively high in adulthood. Especially in longitudinal analyses, this

discrepancy highlights the need to account for the time that each individual has free in the community to offend (i.e. exposure time; Piquero, Blumstein, Brame, Haapanen, Mulvey, & Nagin, 2001). Official criminal convictions from the ages of 12 to 23 were used in trajectory analyses to identify distinct patterns of offending.

#### **4.4.2. Demographic Characteristics and Foster Care**

Age at interview, gender, and ethnicity were self-reported by each participant as part of their structured interview with RAs. The majority of participants were male ( $n = 557$ ; 82.2%). Participants were defined as being either White ( $n = 358$ ; 52.8%), Indigenous ( $n = 216$ ; 31.9%), or a non-Indigenous minority ( $n = 104$ ; 15.3%). The latter category included the small subsample of individuals that were Black, Hispanic, Indian, Middle Eastern, and Asian, but these categories were collapsed due to low prevalence. Participants were also asked if they were ever placed in foster care at any point prior to their interview. Foster care encompassed placement in foster homes, as well as group homes, single room occupations, and youth agreements regarding independent living. As expected, a majority (59.3%;  $n = 402$ ) of individuals in the sample reported having a history of placement in care. Although older youth would have more of an opportunity to experience placement in foster care compared to younger youth, there was no meaningful difference in age of interview between those with 15.82 (SD = 1.20) and without 16.24 (SD = 1.35) a history of placement in care ( $t(638.25) = 4.12, p < .001$ ).

#### **4.4.3. Criminogenic Risk Factors**

All criminogenic risk factors were self-reported by youth at the time of the participant's interview. Based on theoretical relevance, four types of risk were examined: gang involvement, negative self-identity, substance use versatility, and youth-reported parental maltreatment. Gang involvement was a dichotomous item constructed by examining the youths' answers to four questions in the structured interview pertaining to gang-related activities. If they had responded "yes" to any of the following four questions, they were coded as being gang-involved:

- *In general, fight because – gang related*
- *In custody, fight because – gang related*

- *What do you feel led you towards involvement in crime? – Protection through gang membership*
- *Have you ever taken part in a gang fight?*

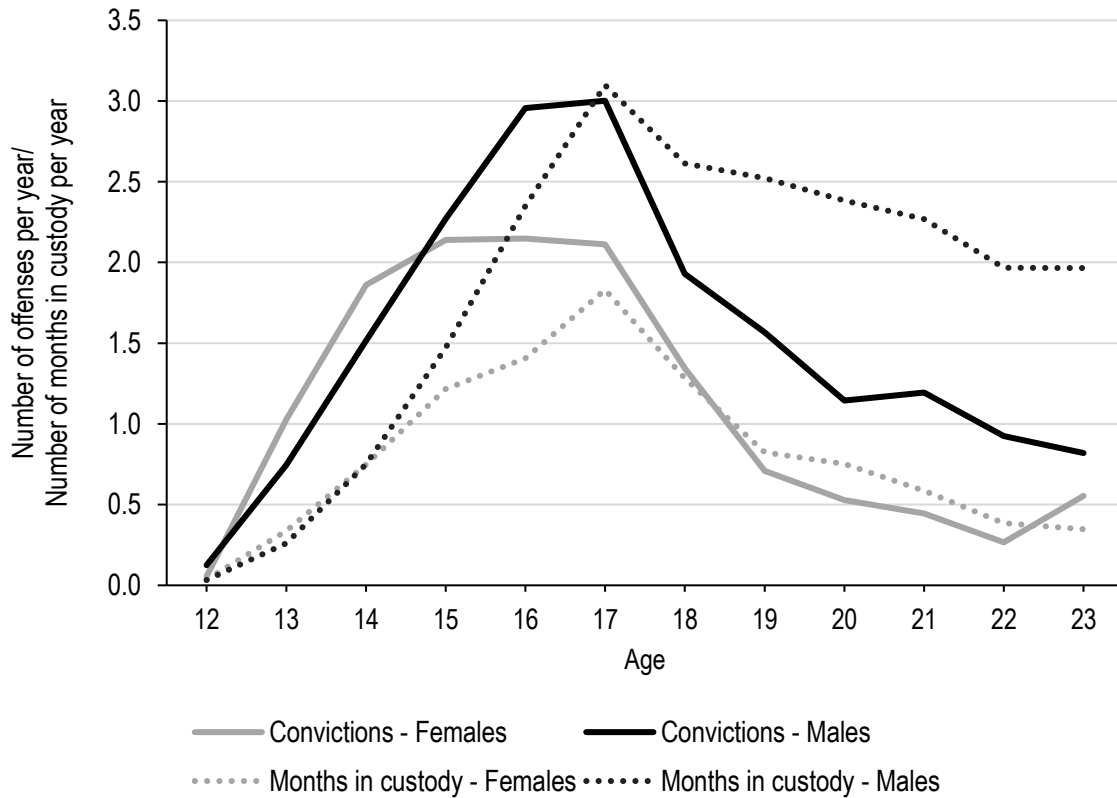
Negative self-identity was measured using Schneider's (1990) Good Citizen's Scale, a self-report inventory of 15 characteristics meant to capture traits consistent with the identities of "good citizens" and "law breakers" (Cronbach's alpha = 0.75). Participants were given pairs of words (e.g. good/bad; polite/rude; dishonest/honest) and were asked to rate on a scale of 1-7 which of the two words they felt best described themselves. For the purposes of the current study, items were reverse-coded so that higher scores indicated a negative identity. To measure parental maltreatment and substance use versatility, dichotomous items were aggregated into scales. As such, Cronbach's alpha was inappropriate for the evaluation of internal reliability. Gadermann, Guhn, and Zumbo (2012) found that Cronbach's alpha tended to underestimate the reliability of scales comprised of dichotomous or ordinal-level items because it is based on the Pearson covariance matrix, which requires an assumption of continuous variables. Instead, using a tetrachoric correlation-based alpha ( $\alpha$ ) for dichotomous data quantifies the reliability of the item response data by invoking an underlying continuous variable for each item ( $\alpha = k \times r_{avg} / [1 + (k - 1) r_{avg}]$ ).

To measure parental maltreatment, items were used from Straus's (1979) parent-child conflict tactics scales (CTS) which are empirically validated measures of intrafamilial conflict and violence, commonly used in clinical settings (see Straus, 1990; Straus & Hamby, 1997). Items in the scale range from forms of verbal conflict (e.g., shaming, insulting, swearing) to physical assault (e.g., hitting, beating, choking; see Appendix C). Questions pertaining to the parent-child relationship as well as the child's exposure to conflict between parents were self-reported in the structured interviews, but as the focus of the current study was specifically on parental victimization of the child, only those items reflecting parent perpetration were considered. It is also important to note that these questions pertained solely to the youth's biological parents, rather than their experiences with foster parents or adoptive parents. Furthermore, although the response options in the administered CTS checklist ranged from 0 for "No, not true," 1 for "Sometimes, somewhat true" and 2 for "Yes, very true," these responses were collapsed into dichotomous variables where 1 represented both "Sometimes somewhat true" and "Yes, very true" in order to create a global scale representing a youth's

versatility of maltreatment experiences ( $\alpha_{tc} = 0.96$ ). Substance use versatility was measured by creating an aggregate scale of self-reported use of nine types of substances (alcohol, marijuana, hallucinogens, ecstasy, cocaine, heroin, crack cocaine, crystal methamphetamine, and illegal use of prescription pills;  $\alpha_{tc} = 0.92$ ).

**Table 4.1 Descriptive characteristics of the sample (n = 678)**

		%(n)	M(SD)
<u>Demographic factors</u>			
	Male	82.2% (557)	
	Age at interview		16.01 (1.31)
<u>Ethnicity</u>			
	White	52.8% (358)	
	Indigenous	31.9% (216)	
	Non-Indigenous minority	15.3% (104)	
<u>Criminogenic risk factors</u>			
	Foster care placement	59.3% (402)	
	Gang involvement	68.0% (461)	
	Negative self-identity		50.52 (9.64)
	Substance use versatility		5.29 (2.04)
	Child maltreatment		5.35 (3.70)
<u>Offending profile</u>			
	Age of onset		14.85 (1.51)
	Total convictions (age 12 – 23)		16.09 (12.27)
	Violent convictions (age 12 – 23)		2.73 (2.59)
	Days in custody (age 12 - 23)		580.15 (632.24)



**Figure 4.1 Average conviction rate and length in custody for males and females from age 12 to 23**

## 4.5. Analytic Strategy

First, missing data were estimated using multivariate imputation by chained equations (MICE) using Stata IC 15 for five of the independent variables: foster care (3.3%;  $n = 23$ ), substance use versatility (1.3%;  $n = 9$ ), negative self-identity (13.7%;  $n = 93$ ), gang involvement (7.4%;  $n = 50$ ), child maltreatment (16.1%;  $n = 109$ ). MICE was selected rather than multivariate normal imputation (MVNI), as the assumption of multivariate normality could not be met, particularly with the inclusion of categorical variables (Lee & Carlin, 2010). The variables used to conduct the MICE included all variables used in the final analyses. A total of ten imputations were performed, and the mean of the ten values were used for each case, and these values were used in all descriptive, bivariate, and multivariate analyses.

For the illustrative purposes of bivariate comparisons, criminal career parameters (i.e. age of onset, total number of convictions, violent convictions, and days spent in custody<sup>3</sup>) were also imputed using MICE. These bivariate analyses included chi-square, independent samples t-test, ANOVA, and Pearson's correlation. However, only data that were available were used for the trajectory analyses, as SPGM has its own method of handling missing cases.

For the creation of the outcome variable, SPGM was used to identify offending trajectories in the sample and was conducted using traj for Stata IC 15 (Jones & Nagin, 2013). The zero-inflated Poisson (ZIP) model was used to estimate the distribution of offending trajectories. ZIP is most commonly used in the criminal career literature, as it accounts for periods of criminal inactivity (i.e. intermittency) that are common as individuals reach adulthood (Nagin, 2005). As Nagin and Land (1993) suggest, 'zero' occurrences can occur for two reasons in longitudinal studies of crime: (1) the offender is inactive; or (2) the offender is active, but by chance, does not experience occurrences. The latter scenario may occur if an offender is actively seeking out opportunities to offend, but in the given period, does not encounter attractive opportunities to commit an offense. Thus, there are two data generating processes producing 'zero' convictions in a

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<sup>3</sup> The proportions of missing values were as follows: age of onset (6.6%;  $n = 45$ ), total convictions (38.9%;  $n = 264$ ), violent convictions (38.9%;  $n = 264$ ), days in custody (39.5%;  $n = 268$ ).

given year for any given individual in the current study and a zero-inflated Poisson model was deemed most appropriate.

Given the nature of the current sample, and as illustrated previously in Figure 4.1, it was pertinent to take into consideration exposure time in the current study. Exposure time was accounted for in the model using the number of days spent in custody per each year per each individual, thereby controlling for the amount of time that offenders would be unable to commit any offenses due to lack of opportunity while incarcerated. It is particularly important to control for exposure time in trajectory analyses as chronic offenders with lengthy incarceration periods may be misclassified as non-chronic offenders (Eggleston et al., 2004). Consistent with previous research using ISVYOS data (see McCuish, Corrado, Lussier & Hart, 2014), an adaptation of van der Geest et al.'s (2009) formula for calculating exposure was used, wherein the minimum exposure time was adjusted to be approximately 0.2. For each individual at each age, exposure time was estimated as such:  $\text{Exposure}_{ji} = 1 - (\text{days incarcerated}/455)$  where  $j$  is the respondent and  $i$  is the year of observation. Days incarcerated was divided by 455 days rather than van der Geest et al.'s (2009) original formulation of 760 days to account for the fact that participants in the ISVYOS represent a more serious offending population than used in their study, and thus using their original formula would result in an overestimation of the time that ISVYOS participants spent in the community.

Additional bivariate comparisons were made to examine whether demographic and criminogenic profiles differed across trajectory groups that emerged. The final step in the analytic strategy involved examining the multivariate relationship between criminogenic risk factors and the offending trajectories identified in the SPGM. The first MLR included all variables in the model, to examine the direct effects of the criminogenic risk factors on the offending outcomes. Then, in order to look beyond just the direct foster care-offending relationship, possible moderating effects of the following related risk factors on foster care were examined in subsequent MLR analyses: gang involvement, negative self-identity, substance use versatility, and parental maltreatment. A moderating variable is one that influences the nature or magnitude of the relationship between two variables (i.e. when or for what types of people a given effect exist or does not exist) and including interaction terms in multivariate analyses is a commonly employed strategy to examine the indirect effects of these variables (e.g. Hayes &



Rockwood, 2017). Thus, the last four models were explored to determine whether these variables are independent, or interdependent in their effects.

## Chapter 5.

### Results

#### 5.1. Bivariate Analyses

First, bivariate analyses were conducted between all predictor variables. Bivariate comparisons between non-foster care and foster care offenders (Table 5.1) will be separately examined below. As would be expected, gender was significantly correlated with nearly all criminogenic risk factors examined. Females (76.0%;  $n = 92$ ) were significantly more likely ( $p < 0.001$ ) than males (55.7%;  $n = 310$ ) to report a history of foster care placement. A greater proportion of males in the study reported being gang-involved (71.5%;  $n = 398$ ) than females (52.1%;  $n = 63$ ;  $p < 0.001$ ). It is of interest to note that on average female offenders in the sample had significantly higher scores of negative self-identity (52.63;  $SD = 10.21$ ) as compared to males (50.08;  $SD = 9.46$ ;  $p < 0.01$ ) and reported having used a greater number of substances (6.29;  $SD = 2.08$ ), as compared to males (5.07;  $SD = 1.97$ ;  $p < 0.001$ ). Lastly, female offenders in the sample reported a greater score on the measure of parental maltreatment (6.20;  $SD = 3.89$ ) than did males (5.17;  $SD = 3.63$ ;  $p < 01$ ), albeit only by one additional type of maltreatment. As with most studies in the field of criminology, due to the small number of female offenders in the current study, these results should be interpreted cautiously. Regardless, these findings are important to consider in terms of how it may affect the interpretation of the results of the subsequent analyses examining offending patterns, as (a) it is expected that youth with a greater accumulation of criminogenic risk factors are more frequent offenders, but (b) the frequency of offending for adjudicated females is typically lower compared to adjudicated males (e.g., McCuish et al., 2014).

Ethnicity was also significantly correlated to criminogenic risk factors. For negative self identity, substance use versatility, and parental maltreatment, White offenders reported higher scores and non-Indigenous minority offenders reported lower scores, and Indigenous offenders fell in the middle. Gang involvement was also associated with higher scores on negative self identity (51.17;  $SD = 9.29$  versus 49.18;  $SD = 10.24$ ;  $p < 05$ ), and on substance use versatility (5.52;  $SD = 1.96$  versus 4.81;  $SD = 2.15$ ;  $p < 0.001$ ). Lastly, youth who were gang-involved reported a significantly higher

number of types of maltreatment victimization (5.93; SD = 3.67) than did non-gang members (4.12; SD = 3.47).

As foster care placement was a primary variable of interest in the study, bivariate comparisons were examined separately in Table 5.1. As expected based on the literature, youth who reported a history of placement in foster care had significantly worse outcomes with regard to criminogenic risk factors and criminal career parameters<sup>4</sup>. Although in general there is an overrepresentation of Indigenous offenders in the Canadian criminal justice system (LaPrarie, 2002), this overrepresentation was particularly magnified among foster care youth in the current study. As previously mentioned, female offenders were disproportionately more likely to have histories of foster care. With the exception of gang involvement, foster care youth were significantly more likely to be characterized by all criminogenic risk factors under consideration (negative self-identity, substance use versatility, child maltreatment). Furthermore, Table 5.1 also provides a comparison of basic criminal career parameters. Compared to non-foster care youth, youth in care averaged a significantly earlier age of onset, spent a greater amount of time incarcerated, and offended more frequently between the ages of 12 to 23. Youth in care were also on average convicted of a greater number of violent offenses than their non-foster care counterparts, indicating that they were not only frequent offenders, but also more serious offenders. Such findings are particularly noteworthy, given that females were disproportionately more likely to have histories of foster care, yet compared to males, averaged significantly less time incarcerated between ages 12 to 23 (302 days versus 643 days [ $t(246.69) = - 8.54, p < .001$ ]) and also averaged significantly fewer convictions over this period (12.57 versus 17.13 [ $t(244.37) = - 5.64, p < .001$ ]).

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<sup>4</sup> As previously discussed, MICE was used to impute missing data for these criminal career parameters for illustrative purposes. The values did not substantially differ from an initial set of analyses conducted prior to imputing these values, however, the imputed values were kept in these bivariate analyses for the purpose of consistency of group sizes for comparison. See Appendix X.

**Table 5.1 Bivariate comparisons of non-foster care and foster care youth**

	NFC ( <i>n</i> = 276)	FC ( <i>n</i> = 402)	
	% ( <i>n</i> )/M(SD)		$\chi^2/t$ ; $\phi/d_{Cohen}$
<u>Demographic factors</u>			
Male	89.4% (247)	77.1% (310)	$\chi^2(1) = 17.10^{***}$ ; $\phi = -0.16$
Ethnicity			
White	55.8% (154)	50.7% (204)	$\chi^2(2) = 28.58^{***}$ ; $\phi_c = 0.21$
Indigenous	22.1% (61)	38.6% (155)	
Non-Indigenous minority	22.1% (61)	10.7% (43)	
<u>Criminogenic risk factors</u>			
Gang involvement	66.3% (183)	69.2% (278)	$\chi^2(1) = 0.61$ ; $\phi = 0.03$
Negative self-identity	49.08 (9.47)	51.52 (9.64)	$t(676) = -3.26^{***}$ ; $d = 0.26$
Substance use versatility	4.96 (2.06)	5.51 (2.01)	$t(676) = -3.47^{***}$ ; $d = 0.27$
Child maltreatment	4.78 (3.56)	5.74 (3.75)	$t(676) = -3.47^{***}$ ; $d = 0.26$
<u>Criminal career parameters</u>			
Age of onset	15.32 (1.41)	14.54 (1.46)	$t(676) = 6.91^{***}$ ; $d = 0.54$
Total convictions (12 – 23)	12.64 (9.27)	18.83 (10.27)	$t(676) = -8.01^{***}$ ; $d = 0.63$
Violent convictions (12 – 23) <sup>†</sup>	2.33 (1.76)	3.05 (2.35)	$t(671.04) = -4.59^{**}$ ; $d = 0.46$
Days incarcerated (12 – 23)	506.08 (498.98)	634.38 (531.58)	$t(676) = -3.17^{**}$ ; $d = 0.25$

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Note. <sup>†</sup> Levene's test of equal variances was violated for variables under consideration

## 5.2. Trajectory Analysis

A successive series of SPGM were performed in order to determine the number of trajectories that most appropriately fit the data. Based on the model fit statistics presented in Table 5.2, a four-group quadratic model emerged as the most suitable for the data. Following previous research (e.g., D'Unger, Land, & McCall, 2002) Bayesian Information Criteria (BIC) values were used to identify the number of offending trajectories that best represented the data. BIC values closer to zero indicate better model fit (Livingston, Stewart, Allard, & Ogilvie, 2008). According to Baskin-Sommers and Baskin (2016) three considerations should inform the selection of the best trajectory solution: lowest BIC value, parsimony, and no trajectories that contain less than 5% of the sample. The BIC value for the four-group model was -14433.24, a marked improvement from a three-group model (BIC = -14929.67), but not from a five-group model (BIC = -14127.91). However, a five-group model would have resulted in a trajectory group representing less than 10% of the total sample and that, upon a visual inspection of the trajectories, did not depart substantially from an adjacent trajectory. Therefore, in emphasizing a parsimonious solution, a four-group trajectory model was retained for subsequent analyses.

The names of the offending trajectories were determined based on a visual examination of the shape and peak of the offending trajectories as depicted in Figure 5.1. These four trajectories were labelled low rate offenders (45.6% of the sample) classic desisters (17.4% of the sample), moderate chronics (25.1% of the sample), and high rate chronics (11.9% of the sample). Table 5.2 also outlines the mean group probabilities, representing the accuracy of classification into the above identified groups. The mean group probabilities were good (see Nagin, 2005), ranging from 0.89 to 0.97. Additionally, odds of correct classification (OCC) were also used as an indication of classification accuracy, as they are generally a more conservative estimate of trajectory assignment (Nagin, 2005). For the current study, weighted posterior proportions were used for the calculation of OCC, rather than proportions based on the maximum posterior probability (Wheeler, 2016). The low rate offending trajectory had the lowest odds of correct classification (OCC) value of 11.35, which was expected, given that they represent a greater proportion of the sample (45.6%), and thus there is likely to be

greater within-group variability. Nonetheless, all groups met Nagin's (2005) suggested threshold of OCC greater than five as an indication of high classification accuracy.

**Table 5.2. Fit statistics for zero-inflated Poisson model with four groups ( $n = 678$ )**

	Offending trajectories			
	Low rate offenders	Classic desisters	Moderate chronics	High rate chronics
$n$ (%)	309 (45.6%)	118 (17.4%)	170 (25.1%)	81 (11.9%)
<u>Estimated model parameters</u>				
Intercept	-39.78	-35.86	-21.62	-16.46
Linear	4.67	4.87	2.44	2.44
Quadratic	-0.14	-0.16	-0.06	-0.06
<u>Model fit characteristics</u>				
Peak age	17	15	17	16
Median group probability	1.00	1.00	1.00	1.00
Range	0.42 – 1.00	0.53 – 1.00	0.47 – 1.00	0.57 – 1.00
Mean group probabilities M(SD)				
Low rate offenders	<b>0.89 (0.20)</b>	0.04 (0.09)	0.05 (0.10)	0.02 (0.04)
Classic desisters	0.02 (0.06)	<b>0.97 (0.08)</b>	0.01 (0.04)	0.00 (0.02)
Moderate chronics	0.03 (0.08)	0.01 (0.05)	<b>0.94 (0.12)</b>	0.02 (0.07)
High rate chronics	0.00 (0.00)	0.01 (0.05)	0.04 (0.09)	<b>0.96 (0.10)</b>
OCC	11.35	129.45	41.79	151.25

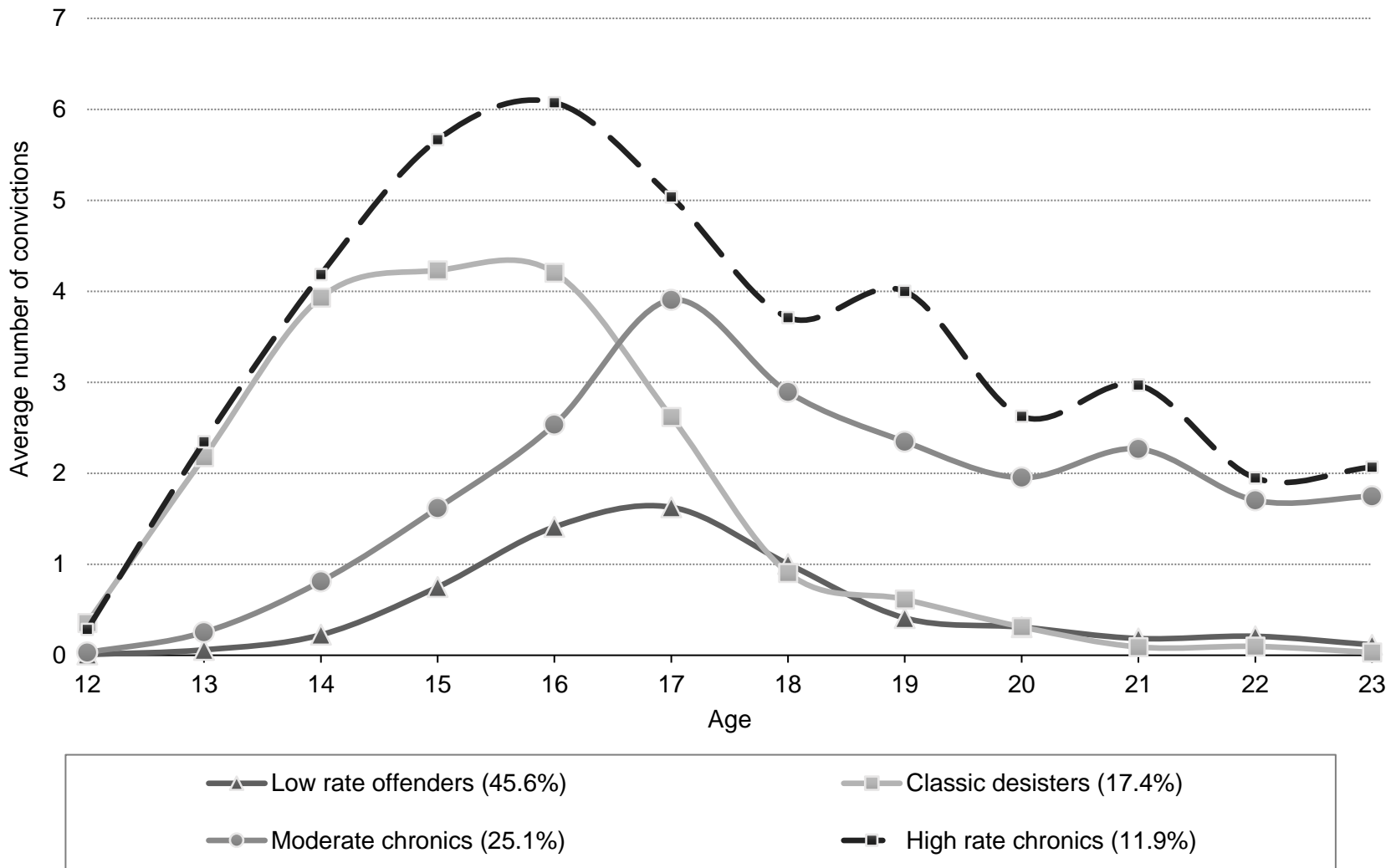


Figure 5.1: Offending trajectories (convictions over age) from age 12 to 23



Bivariate comparisons across trajectory groups are presented in Table 5.3. Low rate offenders represented the largest group of individuals, comprising nearly half of the sample (45.6%), with offending peaking at age 17. These offenders had incurred the fewest number of offenses at 6.09 (SD = 4.04) convictions between ages 12 to 23. The classic desisters represented 17.4% of the sample and were labelled as such as their bell-shaped pattern of offending closely resembled the age-crime curve of offending, with their frequency of convictions peaking at around age 15 to 16, and rapidly declining thereafter. Offenders in this groups averaged 19.58 (SD = 7.59) convictions, with most of these offenses occurring before the age of 18. The moderate chronic trajectory, making up 25.1% of the sample averaged 21.77 (SD = 7.16) convictions, peaking at age 17 and reaching a leveling off period in their early 20s. Finally, for the high rate chronic group (11.9%), offending peaked at age 16, levelling off to conviction rates similar to the moderate chronic group in their 20s. This trajectory averaged the greatest mean number of convictions (38.20, SD = 10.33) and had the highest proportion of males (95.1%) as compared to the other trajectory groups. As would be expected, compared to all other offending groups, the high rate chronic trajectory had incurred the greatest number of violent convictions (5.68 convictions; SD = 3.82). However, when considering this number as a proportion of the total number of convictions, the rate of violent convictions incurred was on par with the classic desisters and moderate chronics (representing around 15% of total convictions), and actually less than the proportion of violent offenses committed by low rate offenders (~24%). Thus, this may suggest that offenders in the high rate chronic group were not necessarily more violent offenders.

It is also interesting to note that each successively more serious trajectory had a greater average number of days spent in custody, with youth in the high rate chronic group spending an average of nearly five years (1676.80 days) spent in custody between the ages of 12 to 23, as compared to the low rate offending group, who spent approximately 6.5 months (195.60 days) in custody during the same time period. Even in comparison with the next most chronic group of offenders (i.e. moderate chronics) in the sample, individuals in the high rate chronic group spent twice as much time in custody than the moderate chronic group (818.62 days). Classic desisters and high rate chronics were also younger at their average age of onset as compared to the other two offending groups.

In examining the criminogenic risk factors across the offending groups (see Table 5.3), high rate chronic offenders had a significantly greater proportion of foster care youth within their group, as compared to the other trajectories. Despite accounting for 59.3% of the sample, foster care youth represented 81.5% of the high rate chronic group. Negative self identity scores although significantly differing across groups, did not range substantially between them. Substance use versatility and parental maltreatment rates were also similar across offending groups; however, it is interesting to note that the moderate chronic offending group had worse outcomes than did high rate chronic offenders.

**Table 5.3. Bivariate comparisons of trajectory groups**

	Low rate offenders ( <i>n</i> = 309; 45.6%)	Classic desisters ( <i>n</i> = 118; 17.4%)	Moderate chronics ( <i>n</i> = 170; 25.1%)	High rate chronics ( <i>n</i> = 81; 11.9%)	
	%( <i>n</i> )/ <i>M</i> ( <i>SD</i> )				<i>F</i> / <i>x</i> <sup>2</sup> ; <i>η</i> / <i>φ</i>
<u>Demographic factors</u>					
Male	78.6% (243)	74.6% (88)	87.6% (149)	95.1% (77)	<i>x</i> <sup>2</sup> (3) = 19.93***; <i>φ</i> = 0.17
<u>Ethnicity</u>					
White	52.1% (161)	55.1% (65)	55.9% (95)	45.7% (37)	<i>x</i> <sup>2</sup> (6) = 14.01*; <i>φ</i> = 0.10
Indigenous	27.8% (86)	33.1% (39)	33.5% (57)	42.0% (34)	
Non-Indigenous minority	20.1% (62)	11.9% (14)	10.6% (18)	12.3% (10)	
<u>Criminal career parameters</u>					
Age of onset <sup>†</sup>	15.53 (1.34) <sup>bcd</sup>	13.59 (0.97) <sup>ac</sup>	15.11 (1.28) <sup>abd</sup>	13.59 (1.06) <sup>ac</sup>	<i>F</i> (3) 101.44***; <i>η</i> = 0.56
Total convictions <sup>†</sup>	6.09 (4.04) <sup>bcd</sup>	19.58 (7.59) <sup>ad</sup>	21.77 (7.16) <sup>abd</sup>	38.20 (10.33) <sup>ad</sup>	<i>F</i> (3) = 354.56***; <i>η</i> = 0.85
Violent convictions <sup>†</sup>	1.52 (1.45) <sup>bcd</sup>	3.05 (2.61) <sup>ad</sup>	3.36 (2.28) <sup>ad</sup>	5.68 (3.82) <sup>abc</sup>	<i>F</i> (3) = 47.32***; <i>η</i> = 0.51
Days in custody <sup>†</sup>	195.60 (318.38) <sup>bcd</sup>	501.68 (480.91) <sup>acd</sup>	818.62 (510.74) <sup>abd</sup>	1676.80 (541.17) <sup>abc</sup>	<i>F</i> (3) = 155.89***; <i>η</i> = 0.73
<u>Criminogenic risk factors</u>					
Foster care placement	47.9% (148)	67.8% (80)	63.5% (108)	81.5% (66)	<i>x</i> <sup>2</sup> (3) = 37.95***; <i>φ</i> = 0.24
Gang involvement	65.0% (201)	62.7% (74)	74.1% (126)	74.1% (60)	<i>x</i> <sup>2</sup> (3) = 7.05; <i>φ</i> = 0.10
Negative self-identity	49.57 (9.62) <sup>b</sup>	52.62 (10.04) <sup>a</sup>	51.01 (9.40)	50.12 (9.27)	<i>F</i> (3) = 3.10*; <i>η</i> = 0.12
Substance use versatility	5.00 (2.10) <sup>c</sup>	5.23 (1.98)	5.78 (1.92) <sup>a</sup>	5.43 (2.00)	<i>F</i> (3) = 5.53***; <i>η</i> = 0.16
Parental maltreatment	5.43 (3.63) <sup>b</sup>	4.29 (3.49) <sup>ac</sup>	5.98 (3.78) <sup>b</sup>	5.26 (3.84)	<i>F</i> (3) = 5.05**; <i>η</i> = 0.02

\**p*<.05; \*\**p*<.01; \*\*\**p*<.001

Note. † Levene's test of equal variances was violated for variables under consideration, Dunnett T3 is reported. a= significantly different from 'low rate offenders'; b = significantly different from 'classic desisters'; c= significantly different from 'moderate chronics'; d= significantly different from 'high rate chronics'

### 5.3. Multinomial Logistic Regression

For the final analyses, multinomial logistic regression (MLR) was used to examine the multivariate relationships between trajectory groups and criminogenic risk factors while controlling for demographic characteristics. The results of the baseline model are presented in Table 5.4, in which odds ratios (ORs) and 95% confidence intervals (95% CI) are reported. The subsequent Table 5.5 presents three models examining three interaction effects separately and only ORs are presented (see Appendix D for 95% CIs). For all MLR models, the low rate offender trajectory was used as the reference category, as this group of offenders had incurred the fewest number of convictions, and also represented the greatest proportion of offenders in the sample. Thus, all interpretations of the models provided below will be in reference to the low rate offender group. The assumption of independence of irrelevant alternatives inherent in multinomial logit models was tested using the Hausman-McFadden test, wherein the model coefficients were considered after removing an alternative from the choice set, and comparing the new parameter estimates with the original estimates. Although the assumption did not hold<sup>5</sup>, the logit model was retained for the final analysis and is presented below. Variance inflation factors and tolerance values were considered to test for multicollinearity, and all variables had appropriate values<sup>6</sup>.

Overall, the MLR model presented in Table 5.4 was significant ( $p < 0.001$ ), with a pseudo- $R^2$  value of 0.18. Mirroring the bivariate relationships, even at the multivariate level, individuals in the high rate chronic trajectory were significantly more likely to be male (OR = 8.79; CI = 2.98 – 25.94;  $p < 0.001$ ). Controlling for theoretically relevant risk factors, youth who reported having been placed in foster care were more than five times as likely to belong to the high rate chronic offending trajectory as compared to the low rate offending trajectory (OR = 5.37; CI = 2.86 – 10.08). In examining the remaining criminogenic risk factors, gang involvement was not significantly predictive of trajectory group membership, however, negative self-identity, substance use versatility, and child maltreatment were significantly predictive of membership to some groups. A greater

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<sup>5</sup> A multinomial probit model was considered for analysis, but was unable to be performed due to the large sample size in the current study.

<sup>6</sup> VIF values were all under 1.50, tolerance levels were under 1, indicating that multicollinearity was not a concern.

score on negative self identity was only predictive of belonging to the classic desisters group as compared to the low rate offender group. Greater substance use versatility was also associated with membership to the moderate chronic and high rate chronic groups, with each additional substance used resulting in increased odds of belonging to the moderate chronic group by a factor of 1.22 (CI =1.09 – 1.36), and by a factor of 1.16 (CI = 1.01 – 1.34) for the high rate chronic group, as compared to low rate offenders. Surprisingly, a one-unit increase in an additional type of maltreatment decreased the odds of being classified in the classic desisters group compared to the low rate offender group by a factor of 0.88 (CI = 0.82 – 0.94).

All four models examining interaction terms between foster care and other theoretically-relevant covariates are presented in Table 5.5. For ease of interpretation, only OR values are presented, and their respective confidence intervals are presented in Appendix D. With regard to demographic characteristics, values for gender and ethnicity remained similar for the baseline model. Once accounting for the interaction between foster care and gang involvement, foster care placement remained a significant predictor of membership in the high rate chronic offending group. In Model 2, controlling for the interaction between foster care and negative self identity, foster care placement was not significant across all groups. Controlling for the foster care and substance use versatility interaction, foster care placement was only predictive of membership in the classic desister group as compared to the low rate offender group. Lastly, controlling for the interaction between foster care and child maltreatment in Model 4, the ORs of the significant associations were not markedly different from the baseline model for nearly all predictors. However, foster care placement was not significantly predictive of trajectory group membership. In sum, none of the interaction effects examined were statistically significant in their respective models, and the main effects of the hypothesized moderating variables were also non-significant. This suggests that each of the risk factors gang involvement, negative self-identity, substance use versatility, and parental maltreatment, did not moderate the relationship between foster care and offending trajectories. Instead, these findings lend support to the independent and unique effect of foster care on offending outcomes, and the possibility of alternative moderating or mediating variables that were not measured in the current study. The implications of these findings will be discussed in the following section.

**Table 5.4: Multinomial logistic regression baseline model with offending pattern as the outcome of interest**

	Classic desisters (n = 118; 17.4%)	Moderate chronics (n = 170; 25.1%) OR(95% CI)	High rate chronics (n = 81; 11.9%)
<u>Demographic factors</u>			
Male	0.97 (0.55 – 1.70)	<b>3.10 (1.73 – 5.55)***</b>	<b>8.79 (2.98 – 25.94)***</b>
Ethnicity <sup>a</sup>			
Indigenous	0.92 (0.56 – 1.52)	1.20 (0.77 – 1.88)	1.61 (0.91 – 2.84)
Non-Indigenous minority	0.60 (0.30 – 1.20)	0.67 (0.36 – 1.23)	0.89 (0.39 – 2.01)
<u>Criminogenic risk factors</u>			
Foster care placement	<b>2.27 (1.41 – 3.64)***</b>	<b>1.84 (1.22 – 2.78)**</b>	<b>5.37 (2.86 – 10.08)***</b>
Gang involvement	1.07 (0.66 – 1.73)	1.19 (0.76 – 1.87)	1.26 (0.69 – 2.31)
Negative self-identity	<b>1.03 (1.01 – 1.06)*</b>	1.01 (0.99 – 1.03)	1.00 (0.97 – 1.02)
Substance use versatility	1.04 (0.92 – 1.17)	<b>1.22 (1.09 – 1.36)***</b>	<b>1.16 (1.01 – 1.34)*</b>
Parental maltreatment	<b>0.88 (0.82 – 0.94)***</b>	1.00 (0.95 – 1.06)	0.95 (0.88 – 1.02)
Model fit	-2LL = 1580.18; $\chi^2 = 124.31$ ; $p < 0.001$ ; Nagelkerke pseudo R <sup>2</sup> = 0.18		

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Note. Low rate offenders used as reference category; <sup>a</sup> 'White' used as reference group

**Table 5.5: Multinomial logistic regression analysis examining interaction effects of foster care**

	Model 1			Model 2			Model 3			Model 4		
	CD	MC	HRC	CD	MC	HRC	CD	MC	HRC	CD	MC	HRC
	OR			OR			OR			OR		
<u>Demographic factors</u>												
Male	0.96	<b>3.08***</b>	<b>8.65***</b>	0.97	<b>3.10***</b>	<b>8.91***</b>	0.96	<b>3.21***</b>	<b>9.01***</b>	0.97	<b>3.10***</b>	<b>8.78***</b>
Ethnicity <sup>a</sup>												
Indigenous	0.92	1.20	1.59	0.93	1.21	1.58	0.92	1.19	1.59	0.91	1.19	1.59
Non-Indigenous minority	0.61	0.67	0.90	0.61	0.67	0.90	0.61	0.66	0.88	0.59	0.67	0.89
<u>Criminogenic risk factors</u>												
Foster care placement	1.94	1.46	<b>3.04*</b>	4.55	6.96	0.58	<b>3.54*</b>	0.99	3.51	1.41	1.40	4.10
Gang involvement	0.94	0.99	0.70	1.06	1.17	1.28	1.06	1.19	1.26	1.06	1.18	1.25
Negative self-identity	<b>1.03*</b>	1.01	1.00	1.04	1.02	0.96	<b>1.03**</b>	1.01	1.00	<b>1.03**</b>	1.01	1.00
Substance use versatility	1.04	<b>1.22***</b>	<b>1.16*</b>	1.04	<b>1.21***</b>	1.18*	1.11	1.14	1.10	1.04	<b>1.22***</b>	<b>1.16*</b>
Parental maltreatment	<b>0.87***</b>	1.00	0.95	<b>0.88***</b>	1.00	0.88	<b>0.88***</b>	1.00	0.95	<b>0.81**</b>	0.97	0.92
<u>Interaction effects</u>												
FC * gang	1.27	1.40	2.32	-	-	-	-	-	-	-	-	-
FC * self-identity	-	-	-	0.99	0.97	0.98	-	-	-	-	-	-
FC * substance use	-	-	-	-	-	-	0.92	1.12	1.09	-	-	-
FC * maltreatment	-	-	-	-	-	-	-	-	-	1.12	1.05	1.06
Model fit	-2LL = 1578.33; x <sup>2</sup> = 126.16; p < 0.001; Nagelkerke pseudo R <sup>2</sup> = 0.19			-2LL = 1575.57; x <sup>2</sup> = 128.92; p < 0.001; Nagelkerke pseudo R <sup>2</sup> = 0.19			-2LL = 1577.55; x <sup>2</sup> = 126.94; p < 0.001; Nagelkerke pseudo R <sup>2</sup> = 0.19			-2LL = 1577.61; x <sup>2</sup> = 126.88; p < 0.001; Nagelkerke pseudo R <sup>2</sup> = 0.19		

\*p<.05; \*\*p<.01; \*\*\*p<.001

Note. Low rate offenders used as reference category; <sup>a</sup> 'White' used as reference group. All significant OR do not contain '1' based on 95% confidence intervals. Bold-faced type indicates a significant odds ratio. CD = classic desisters; MC = moderate chronics; HRC = high rate chronics; FC = Foster care.

## **Chapter 6.**

### **Discussion**

Prior research has identified the relationship between early adverse experiences and offending outcomes, and studies have also recognized an array of negative psychosocial outcomes associated with foster care placement. However, for the most part, these areas of research have occupied separate domains. Studies have only recently started examining the criminal trajectories of vulnerable youth (e.g. Ryan et al., 2015; Widom, Fisher, Nagin, & Piquero, 2018) and very few have investigated foster care specifically. Given the existence of a foster care-offending relationship, the purpose of the current study was to begin to unravel how foster care placement comes to influence offending. In order to elucidate this association, the criminal trajectories of adjudicated youth followed up to a period of early adulthood were examined, and the indirect effects of several possible moderating variables were also examined in relation to these trajectories. Although not directly testing any theories, three prominent theoretical frameworks within the broader DLC paradigm were used in this thesis to provide a framework for examining and interpreting the relationship between foster care and offending. To reiterate, propensity perspectives would suggest a direct and independent effect of foster care on patterns of offending, developmental perspectives suggest that the relationship between foster care and offending is moderated by other relevant risk factors, and life course perspectives suggest that foster care on its own does not influence offending in adulthood. Based on the results, the propensity explanation prevailed; foster care placement influences offending in isolation of other risk factors examined.

Consistent with previous literature on serious and violent young offenders, (e.g. Corrado et al., 2002), multiple criminogenic risk factors were highly prevalent among youth in the sample. There was a high prevalence of gang involvement among both foster care and non-foster care youth, and both groups reported negative self identities, and high frequencies of substance use and child maltreatment. In bivariate comparisons, several risk factors were more prevalent among foster care youth, including negative self-identity, substance use versatility, and child maltreatment. Furthermore, youth with a history of foster care were more likely to begin offending at an earlier age, commit offenses at a frequency of 1.5 times greater than non-foster care offenders, be convicted



of a greater number of violent offenses, and spend a greater length of time incarcerated. These findings were unsurprising, as it would be expected that a greater number of risk factors would be associated with more concerning criminal career parameters. Alternatively, another potential explanation for these discrepancies may be that foster care youth are not only committing more offenses, but are also more likely to be convicted of these offenses. In support of this, Ryan, Herz, Hernandez, and Marshall (2007) found that foster care youth in their study were less likely to receive probation compared to non-foster care youth, and instead experience more punitive responses such as placement in correctional settings, or into group homes or juvenile justice camps, which have been found to be less effective in reducing the likelihood of continued offending. Furthermore, earlier age of onset and a time spent incarcerated in adolescence may interrupt developmental processes, and delay entry into adult roles, subsequently increasing the risk of continued involvement in offending behaviour in emerging adulthood (DeLisi & Piquero, 2011; Piquero, Diamond, Jennings, & Reingle, 2013; Salvatore, 2013). Indeed, consistent with this prior research, foster care youth in the current sample were significantly more likely to exhibit a more chronic patterns of offending extending into adulthood.

Despite that the sample as a whole represent a group of serious and violent young offenders, their patterns of offending were heterogenous. Using SPGM, four offending trajectories were identified: low rate offenders, classic desisters, moderate chronics, and high rate chronics. As expected, the high rate chronic offending trajectory was associated with the most concerning criminal career parameters – that is, earlier age of onset, greater number of convictions, and the greatest number of days in custody as compared to the low rate offending trajectory. It was also unsurprising then, that the high rate chronic group also had the highest proportion of foster care youth. Results of the baseline MLR model reaffirmed what has previously been established (e.g. Yang et al., 2016), that foster care placement is associated with a more chronic pattern of offending. At the multivariate level, foster care placement remained predictive of the high rate chronic offending trajectory. Subsequent MLR models explored whether there were any moderating variables in this relationship.

## 6.1. Viewing Foster Care in Moderation

Addressing the call for more studies examining moderation and mediation analyses (Malvaso et al., 2018), the current study examined the potential moderating effects of gang involvement, negative self identity, substance use versatility, and parental maltreatment. The inclusion of these interaction terms also allowed for a developmental consideration of the foster care-offending relationship – that is, as hypothesized by Moffit (1993), whether it was the conjunction of the abovementioned risk factors that precipitated a persistent pattern of offending. However, none of these interaction terms reached statistical significance in their respective MLR models, suggesting that foster care placement is independent in its effect on patterns of offending. Herein lies support for the propensity perspective; from this standpoint, foster care placement can be seen to predict both negative outcomes of the youth examined, as well as persistent patterns of offending. Indeed, in bivariate analyses, foster care youth were significantly more likely to report greater scores of negative self-identity, greater substance use versatility, and a greater amount of versatility in parental maltreatment. The latter point is particularly important, given that the foster care youth in the current sample were more likely to have spent time away from the biological family home, and thus had less exposure to opportunities of experiencing maltreatment from their biological parents. Furthermore, as the CTS items only captured maltreatment perpetrated by biological parents, actual levels of victimization by parental figures more broadly is likely underestimated for foster care youth. Theoretically, these findings could be purported to support the population heterogeneity explanation of crime, wherein foster care youth represent a different type of offenders that are characterized by greater levels of involvement in crime.

Traditional propensity perspectives have described latent traits such as antisocial potential, or low self-control in order to explain long-term offending outcomes. Although foster care itself is not necessarily a latent trait, it is a social factor that can be used as a proxy to capture a latent criminal propensity. In other words, foster care placement can be seen as a proximal indicator of an underlying propensity to offend. This may be further supported by the higher prevalence of disruptive behaviour among foster care youth as can be inferred by higher rates of fetal alcohol spectrum disorder (FASD) and attention deficit hyperactivity disorder (ADHD) among foster care populations (Corrado

et al., 2011; Ouyang, Fang, Mercy, Perou, & Grosse, 2008). Both of these have been linked with more stable characteristics such as low self-control and deficits in executive functioning and thus could underlie the effects of foster care placement on offending.

Although the points made above could be considered to refute the life-course argument (as indeed, the early experience of foster care was predictive of offending in adulthood), it could also be argued that, in line with a life-course view, foster care itself did not have a direct effect on offending. Re-examining the results presented in Table 5.5 from this position, the main effects of foster care placement were no longer significant in predicting trajectory group membership when accounting for the interactions between foster care and negative self-identity, as well as foster care and child maltreatment. For the interaction with gang involvement and the interaction with substance use versatility, foster care was only predictive of one group for each of these models (high rate chronic offending and a pattern classic desistance, respectively). Thus, a life course theorist may then find that these results are indicative of noise in the relationship, rather than evidence for the direct effect of foster care placement. This is further supported by the finding that despite the lack of significant relationship between foster care placement and gang involvement at the bivariate level, accounting for the interaction between the two nonetheless affected the main effect of foster care placement in Model 1 of Table 5.5. Based on whether a propensity or life-course perspective is used to contextualize the findings of the current study, the explanations for these results appear to be diametrically opposed.

## **6.2. The Chimera Effect: A Case for Developmental Criminology**

Another alternative explanation for the current findings is that measures included simply do not capture the types of interaction effects that are relevant to explaining the link between foster care and crime. For example, the data used for the study did not allow for a measurement of neuropsychological deficits (e.g., conduct disorder, psychopathy) as identified by Moffitt (1993) to play a key role in explaining LCP offenders. Furthermore, when considering Patterson's (1993) developmental concept of the antisocial trait as a chimera, there are complex processes at play that have not been captured in the current study. The concept of antisociality as a chimera invokes the idea that antisociality remains stable in an individual, but the way it manifests changes over

time (Patterson, 1993). In contrast with the propensity perspective (i.e. monocausality), developmental theorists have argued that any single indicator measure of this antisocial trait would be “systematically biased” (Patterson, 1993, p.912). From this point of view, each negative outcome that a foster care youth experiences represents an additional graft on the original trait. Thus, in this sense, as within the propensity argument, foster care placement can be seen as a proxy measure for some latent propensity for antisocial behaviour. Then, each additional negative outcome experienced may change the form and/or intensity of antisocial behaviour, but not necessarily the original essence of antisociality. However, the variables examined within the current thesis simply were not the primary factors at play.

Adversities specific to a youth’s experience within the foster care system are worthy scholarly avenues to explore. For example, some relevant factors to consider are the length of time a child spends in foster care and the number of foster care placements. Children and youth who spend a long duration of time within the child welfare system (i.e. two or more years) are significantly more likely to offend in adulthood, as compared to those who experienced short-term placements (Bullock & Gaehl, 2012). A UK study followed youth in care over a 25-30 period and compared long term placement (2 or more years) and short-term placement (less than 35 days) in care (Bullock & Gaehl, 2012). In this study, 35% of long-term foster care youth offended in adulthood compared to 18% of short-term placement youth. Furthermore, youth in long-term care had higher rates of premature mortality rates, particularly due to unnatural causes (i.e., suicide), and these mortality rates were even higher for those identified as persistent offenders (defined as having six or more convictions). Although the current study did not measure length of time spent in foster care, prior studies suggest that a relationship between a lengthier placement in care, and emotional and behavioural difficulties in adulthood may also affect criminality in adulthood (Dregan & Gulliford, 2012).

The number of different placements in foster homes has also been found to increase the risk of involvement with the juvenile justice system, particularly for younger children (Cutuli et al., 2016; Newton, Litrownik, & Landsverk, 2000). This is presumably due to the risks associated with placement disruptions and frequent residential moves which may make it difficult for youth to build lasting friendships, settle in schools, and develop meaningful relationships with their caregivers. Furthermore, residential mobility

related to multiple out-of-home placements may cause disruptions in education (Blome, 1997), and the greater average amount of time that youth in care spend incarcerated as compared to their non-foster care peers, is also concerning, as it also creates barriers to completing high school and post-secondary education. Although these parameters were not examined in the current study, they may be relevant in interpreting the findings – namely, the robust relationship between foster care placement and a pattern of high rate chronic offending. In the Midwest Evaluation of the Adult Functioning of Former Foster Youth, Courtney, Lee, Raap, and Dworsky (2010) found that by age 23, only a quarter of former foster care youth had high school diplomas or Graduate Equivalency Degrees (GEDs). More specific to the Canadian context, in 2009, a higher proportion of foster care youth in British Columbia were likely to become involved with the criminal justice system than graduate from high school (35.5%, 24.5% respectively; British Columbia, 2009). This is particularly important given that educational attainment is directly related to improved job prospects and financial stability in adulthood, and thus social capital (Huebner, 2005). Thus, these general findings regarding the educational outcomes of foster care youth suggest that youth in the current sample may have experienced similar deficits in educational attainment – and thus, the attainment of human capital – influencing their continued offending at a high rate in early adulthood.

Furthermore, youth with greater emotional and behavioural needs are more likely to experience multiple placements in care (Oosterman, Schuengel, Slot, Bullens, & Doreleijers, 2007), which has the potential to not only exacerbate existing mental health needs and behavioural problems, but also increase the likelihood of placement into group homes, which are associated with worse outcomes for youth (Cutuli et al., 2016). Placement in group homes is considered to be a last resort for children and youth in need of child welfare intervention, stemming from the concern that group care may facilitate negative peer associations that could undermine therapeutic processes and increase criminal outcomes (Chamberlain & Reid, 1994; Leve & Chamberlain, 2005). This notion is empirically supported, as individuals placed in group homes have been associated with poorer social and psychological outcomes (Farris-Manning & Zandstra, 2003), have a higher number of behavioural problems (Ryan et al., 2008), and have been found to be twice as likely to engage in antisocial behaviour than family-based foster homes (Baskin & Sommers, 2011; Ryan et al., 2007). These negative outcomes may be the consequence of a lack of a family structure in the home, or it may be the

case that group home placement is reserved for children with behavioural problems or needs that are less manageable in other settings resulting in a higher base rate of behavioural problems. The current study showed that for kids placed in foster care, foster care was not so much a last resort that helped address underlying issues; instead, foster care placement signaled that much more intensive support was needed. Very importantly, this was in the context of examining serious and violent youth, and is not generalizable to all foster care situations, but rather to a small subgroup of youth in care. That said, considering that approximately 10% of youth in care end up in the criminal justice system, understanding this subgroup and their disproportionate involvement is particularly valuable in the study of serious offenders. Although the impact of these foster care-specific factors was not examined in the current thesis, the literature presented above suggests that they may contribute to the chimera effect, influencing the way in which criminality is manifested (i.e. the pattern of offending over time). In other words, elucidating the nature of the foster care experience might help reveal why foster care youth are disproportionately associated with a wide range of negative outcomes that include, but is not limited to, chronic offending.

When examined in tandem with the developmental concept of cumulative continuity of risk (Moffitt, 1993), these additive adversities experienced within foster care have important implications in the transition into adulthood. Despite the recent changes in the way that the period of emerging adulthood is experienced (Arnett, 2000; Smith, 2011), programming and policies governing youth in care have yet to catch up to reflect the developmental implications of these changes. Once adolescents reach the age of majority, they are granted autonomy to make potentially life-changing decisions, yet economic realities require ongoing dependence on parental support – whether that be financial or emotional. Therefore, during this time, those who are already disadvantaged in terms of social capital due to early adversities, poor educational attainment, and criminal histories may not necessarily be able to benefit from the same opportunities available to the general population. Therefore, for youth in care, this transitional period may be especially difficult, and play an instrumental role in their persistence or desistance from crime.

Representing the cumulative continuation of disadvantage, emerging adults with a history of foster care are overrepresented as recipients of government income assistance (Courtney et al., 2011; Rutman, Hubberstey, & Feduniw, 2007), and remain

overrepresented in low-wage jobs in the service sector (Goodkind, Schelbe, & Shook, 2011). Furthermore, incarceration has consequences for employment prospects in adulthood (van der Geest et al., 2016). In accordance with a developmental perspective, the accumulation of risk throughout the life course can affect both the availability of opportunities to desist in emerging adulthood, as well as the extent to which the pursuit of these opportunities can benefit the offender. In sum, although not directly supported in the findings of the current study, developmental explanations of the foster care-offending relationship may still be at play. Taken together, this precludes a life-course explanation – particularly the view that all offenders would eventually desist from crime either through agentic change (e.g. individuals actively choosing to desist or persist in crime; Laub, 2006) or due to the structural nature of social institutions (e.g. employment, marriage; Laub & Sampson, 2003). Such a position trivializes the disadvantages that youth experience as a result of their involvement with the foster care system. Specifically, in the transition to adulthood, where rather than an age of opportunity and identity exploration (e.g. Arnett, 2000), youth in care are facing the abrupt loss of social and financial supports as they transition out of foster care. Thus, to take on a life-course perspective would be to discount the impact of the many disadvantages that foster care youth accrue across various stages of development, and the ramifications of this gap in social capital upon reaching adulthood. For a more precise test of the life course perspective, a longer follow-up period is needed to evaluate whether the foster care effect continues through middle adulthood.

As discussed, the chimera effect of foster care provides a potential explanation of why foster care placement is associated with chronic patterns of offending, and the concept of cumulative continuity may explain why foster care youth accrue a greater number of negative outcomes, presenting a multi-risk profile of serious violent offenders. Although the current study was not able to directly test for these developmental constructs, it allowed for an exploration of different DLC perspectives. In addressing new directions for research, some limitations of should first be acknowledged.

### **6.3. Limitations and Future Directions**

Youth in the current study were only included in the sample if they had been incarcerated during a period of adolescence. Thus, the study was unable to capture late-bloomer offenders whose onset of offending occurred in adulthood (Krohn, Gibson, &

Thornberry, 2013). Furthermore, as the study examined solely youth who had been incarcerated at least once in adolescence, the sample is not representative of all youth in care, but nevertheless showed that at least among adjudicated youth, youth in care were at an increased risk of exhibiting a chronic trajectory of offending. Furthermore, the current thesis was focused on the periods of adolescence and emerging adulthood, thus only followed the sample to the age of 23. A longer-term design would have provided a more complete picture of the offending trajectories.

Furthermore, the available data did not allow for empirical consideration of time youth may have spent away from their family home (e.g. time spent living at a friend's home, time spent in a foster home). Despite this, youth who reported placement in foster care were still significantly more likely to report greater levels of parental maltreatment. Child maltreatment was represented by an aggregate scale of the different items on the Conflict Tactics Scale. However, as this was an additive scale, less and more serious forms of victimization were treated equally, making it difficult to untangle the salience of different experiences in terms of their direct and indirect relationship with criminal behaviour. Furthermore, focusing only on the presence or absence of an event ignores other important contextual factors that may have implications for whether this adversity influences criminal behaviour – such as frequency or chronicity of such events.

As with most studies using high risk offending samples, the current study only had a small proportion of female offenders. There is a wealth of literature on the gender-specific pathways of victimization and offending, and future studies should take these into account given the general differences in risk factor profiles of males and females (Loeber, Capaldi, & Costello, 2015; Odgers & Moretti, 2002), as well as more specifically, gendered nature of experiences of victimization (DeHart & Moran, 2015).

Although the current study did not find any significant interaction terms in predicting offending trajectories for the variables of interest, future studies should continue to explore different variables that may be at play. For example, measures of neuropsychological deficits – whether they be indirect through the measurement of developmental and psychological disorders – may provide insight into the relationships between childhood risk factors and adult offending. Future studies should explore whether mediating relationships play a role in the relationship between foster care and



offending outcomes. Path analysis and structural equation modeling would appear to provide useful insight in this area of research (Malvaso et al., 2018).

## **6.4. Conclusion**

Current tools for identifying chronic, serious, and violent offenders are largely reactive in nature, wherein these individuals are identified after they have committed the offences that qualify them for this label (Fox et al., 2015). Resource allocation for youth prevention programs is substantially small when compared to punitive responses (Greenwood & Zimring, 2007). Interventions specifically targeting the needs of youth in care in the transition to adulthood may be warranted, given their likelihood of continued involvement in chronic offending. This is especially important given the financial and societal costs associated with this pattern of offending. Using a combination of a group-based trajectory method and an economic evaluation of the costs related to crime, Cohen et al. (2010) identified that the mean cost generated by offenders in a high-rate chronic group of offending were significantly ( $p < 0.05$ ) greater than the costs of a low-rate chronic offending group or an adolescent-limited offending group, accounting for nearly half of the total costs of offending. From these findings, Cohen et al. (2010) estimated that over 200 million dollars could be saved by preventing these individuals from becoming high-chronic offenders. It is economically inefficient to continue funding programs that create a level of dependence that becomes detrimental once an individual is cut off from these resources.

The finding of the foster care and chronic offending overlap in the current study reaffirms what previous studies have suggested: that there needs to be greater coordination between child welfare and youth justice systems. Youth in care are already a vulnerable population, but it appears that in the transitional period of emerging adulthood – where they are dually experiencing the transition into adulthood and the transition out of the child welfare system, their pre-existing disadvantages may become amplified. Thus, for youth already at the deep end of the justice system, the period of emerging adulthood is crucial in terms of interventions, as this would theoretically be the most opportune stage to provide prosocial supports. Specifically, implementing early interventions for foster care youth that are aimed at areas such as educational support and vocational services could make a critical difference in their transitions to adulthood and prevent further negative outcomes. A number of studies have examined the benefits

of extending care and supports for youth in care up to ages 21 to 23 (e.g. Courtney et al., 2009; Delgado, Fellmeth, Packard, Prosek, & Weichel, 2007; Washington State Institute for Public Policy, 2010), and have found improvements in educational and employment outcomes, and an overall greater level of self-sufficiency in adulthood. These findings suggest that investing in extended supports for youth aging out of care could help narrow the gap in social capital between foster care and non-foster care youth, and offset the costs of later adverse outcomes, including those related to chronic, serious, and violent offending.

The theoretical concept of cumulative risk, or alternatively, the view of foster care as a chimera, suggests that foster care youth who are involved in serious and violent offending in adolescence have a high probability of continued involvement in serious and violent offending in adulthood. Findings in the current study provide further support for this. However, this is not to say that such an outcome is inevitable. Rather, these findings should be utilized to spur further research on the various facets of the interrelated adversities common among this population. As suggested above, mediation analyses and measurement of factors such as neuropsychological deficits may provide avenues for further explication of this relationship.

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## Appendix A.

### When Protection is Needed

From Child, Family and Community Service Act, R.S.B.C. 1996, c.46.

**13** (1) A child needs protection in the following circumstances:

- (a) if the child has been, or is likely to be, physically harmed by the child's parent;
- (b) if the child has been, or is likely to be, sexually abused or exploited by the child's parent;
- (c) if the child has been, or is likely to be, physically harmed, sexually abused or sexually exploited by another person and if the child's parent is unwilling or unable to protect the child;
- (d) if the child has been, or is likely to be, physically harmed because of neglect by the child's parent;
- (e) if the child is emotionally harmed by the parent's conduct;
- (f) if the child is deprived of necessary health care;
- (g) if the child's development is likely to be seriously impaired by a treatable condition and the child's parent refuses to provide or consent to treatment;
- (h) if the child's parent is unable or unwilling to care for the child and has not made adequate provision for the child's care;
- (i) if the child is or has been absent from home in circumstances that endanger the child's safety or well-being;
- (j) if the child's parent is dead and adequate provision has not been made for the child's care;
- (k) if the child has been abandoned and adequate provision has not been made for the child's care;
- (l) if the child is in the care of a director or another person by agreement and the child's parent is unwilling or unable to resume care when the agreement is no longer in force.

## Appendix B.

### Committal to Custody

From *Youth Criminal Justice Act*, S.C. 2002, c.1

**39.** (1) A youth justice court shall not commit a young person to custody under section 42 (youth sentences) unless

- (a) the young person has committed a violent offence;
- (b) the young person has failed to comply with non-custodial sentences;
- (c) the young person has committed an indictable offence for which an adult would be liable to imprisonment for a term of more than two years and has a history that indicates a pattern of either extrajudicial sanctions or of findings of guilt or of both under this Act or the Young Offenders Act, chapter Y-1 of the Revised Statutes of Canada, 1985; or
- (d) in exceptional cases where the young person has committed an indictable offence, the aggravating circumstances of the offence are such that the imposition of a non-custodial sentence would be inconsistent with the purpose and principles set out in section 38.

## Appendix C.

### Conflict Tactics Scale

The following items on the conflict tactics scale were aggregated:

- Have they cursed or sworn at you?
- Have they ordered you around?
- Have they insulted or shamed you in front of others?
- Have they pushed, grabbed, or shoved you?
- Have they slapped you?
- Have they shaken you?
- Have they thrown an object at you that could hurt you?
- Have you been injured because of a conflict with them?
- Have they kicked, bitten, or hit you?
- Have they hit or tried to hit you with something?
- Have they physically twisted your arm?
- Have they thrown or tried to throw you?
- Have they beaten you up?
- Have they choked or strangled you?
- Have they threatened you with a knife or gun?
- Have they used a knife or gun on you?

## Appendix D.

### Confidence Intervals for Interaction Effects

**Table 6.1: Appendix FC\*gang**

	Classic desisters ( <i>n</i> = 118; 17.4%)	Moderate chronics ( <i>n</i> = 170; 25.1%)	High rate chronics ( <i>n</i> = 81; 11.9%)
	OR(95% CI)		
<u>Demographic factors</u>			
Male	0.96 (0.55 – 1.68)	3.10 (1.72 – 5.51)***	8.65 (2.93 – 25.48)***
Ethnicity <sup>a</sup>			
Indigenous	0.92 (0.56 – 1.52)	1.19 (0.77 – 1.87)	1.59 (0.90 – 2.81)
Non-Indigenous minority	0.61 (0.31 – 1.21)	0.67 (0.36 – 1.24)	0.90 (0.40 – 2.04)
<u>Criminogenic risk factors</u>			
Foster care placement	1.94 (0.90 – 4.18)	1.40 (0.70 – 3.05)	3.04 (1.07– 8.69)*
Gang involvement	0.94 (0.44 – 2.02)	1.18 (0.51 – 1.93)	0.70 (0.23 – 2.12)
Negative self-identity	1.03 (1.01 – 1.06)*	1.01 (0.99 – 1.03)	1.00 (0.97 – 1.03)
Substance use versatility	1.04 (0.92 – 1.17)	1.22 (1.10 – 1.36)***	1.16 (1.01 – 1.34)*
Parental maltreatment	<b>0.87</b> (0.82 – 0.94)***	0.97 (0.95 – 1.06)	0.95 (0.88 – 1.02)
<u>Interaction effects</u>			
Foster care * gang	1.27 (0.49 – 3.29)	1.05 (0.59 – 3.35)	2.32 (0.63 – 8.47)
Model fit	-2LL = 1578.33; $\chi^2 = 126.16$ ; $p < 0.001$ ; Nagelkerke pseudo $R^2 = 0.19$		

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Note. Low rate offenders used as reference category; <sup>a</sup> 'White' used as reference group

**Table 6.2: Appendix FC\*ID**

	Classic desisters ( <i>n</i> = 118; 17.4%)	Moderate chronics ( <i>n</i> = 170; 25.1%)	High rate chronics ( <i>n</i> = 81; 11.9%)
	OR(95% CI)		
<u>Demographic factors</u>			
Male	0.97 (0.56 – 1.70)	3.10(1.73 – 5.55)***	8.91 (3.01 – 26.37)***
Ethnicity <sup>a</sup>			
Indigenous	0.93 (0.56 – 1.53)	1.21 (0.77 – 1.89)	1.58 (0.90 – 2.80)
Non-Indigenous minority	0.61 (0.31 – 1.20)	0.67 (0.36 – 1.24)	0.90 (0.40 – 2.04)
<u>Criminogenic risk factors</u>			
Foster care placement	4.55 (0.34 – 60.09)	6.96 (0.70 – 63.48)	0.58 (0.03 – 12.74)
Gang involvement	1.06 (0.65 – 1.72)	1.17 (0.75 – 1.85)	1.28 (0.70 – 2.35)
Negative self-identity	1.04 (1.00 – 1.08)	1.02 (0.99 – 1.06)	0.96 (0.90 – 1.01)
Substance use versatility	1.04 (0.92 – 1.17)	1.21 (1.09 – 1.35)***	1.18 (1.02 – 1.36)*
Parental maltreatment	0.88 (0.82 – 0.94)***	1.00 (0.95 – 1.06)	0.88 (0.88 – 1.02)
<u>Interaction effects</u>			
Foster care * neg ID	0.99 (0.94 – 1.04)	0.97 (0.93 – 1.02)	0.98 (0.98 – 1.12)
Model fit	-2LL = 1575.57; $\chi^2$ = 128.92; $p < 0.001$ ; Nagelkerke pseudo $R^2$ = 0.19		

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ Note. Low rate offenders used as reference category; <sup>a</sup> 'White' used as reference group

**Table 6.3: Appendix FC\*Substance**

	Classic desisters ( <i>n</i> = 118; 17.4%)	Moderate chronics ( <i>n</i> = 170; 25.1%)	High rate chronics ( <i>n</i> = 81; 11.9%)
	OR(95% CI)		
<u>Demographic factors</u>			
Male	0.96 (0.55 – 1.69)	3.21 (1.77 – 5.80)***	9.01 (3.04 – 26.69)***
Ethnicity <sup>a</sup>			
Indigenous	0.92 (0.56 – 1.52)	1.21 (0.76 – 1.85)	1.59 (0.90 – 2.80)
Non-Indigenous minority	0.61 (0.31 – 1.22)	0.67 (0.35 – 1.22)	0.88 (0.39 – 2.00)
<u>Criminogenic risk factors</u>			
Foster care placement	3.54 (1.01 – 12.34)*	0.99 (0.31 – 3.16)	3.51 (0.65 – 18.87)
Gang involvement	1.06 (0.65 – 1.73)	1.17 (0.76 – 1.88)	1.26 (0.69 – 2.31)
Negative self-identity	1.03 (1.01 – 1.06)**	1.02 (0.99 – 1.03)	1.00 (0.97 – 1.03)
Substance use versatility	1.11 (0.92 – 1.33)	1.21 (0.98 – 1.34)	1.10 (0.83 – 1.44)
Parental maltreatment	0.88 (0.82 – 0.94)***	1.00 (0.95 – 1.06)	0.95 (0.88 – 1.02)
<u>Interaction effects</u>			
Foster care * substance	0.92 (0.73 – 1.15)	1.12 (0.92 – 1.37)	1.09 (0.80 – 1.49)
Model fit	-2LL = 1577.61; $\chi^2$ = 126.88; $p < 0.001$ ; Nagelkerke pseudo $R^2$ = 0.19		

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Note. Low rate offenders used as reference category; <sup>a</sup> 'White' used as reference group



**Table 6.4: Appendix FC\*Maltreatment**

	Classic desisters ( <i>n</i> = 118; 17.4%)	Moderate chronics ( <i>n</i> = 170; 25.1%)	High rate chronics ( <i>n</i> = 81; 11.9%)
	OR(95% CI)		
<u>Demographic factors</u>			
Male	0.97 (0.55 – 1.69)	3.10(1.73 – 5.56)***	8.78 (2.98 – 25.92)***
Ethnicity <sup>a</sup>			
Indigenous	0.91 (0.55 – 1.50)	1.19(0.77 – 1.86)	1.59 (0.90 – 2.81)
Non-Indigenous minority	0.59 (0.30 – 1.17)	0.67 (0.36 – 1.23)	0.89 (0.39 – 2.01)
<u>Criminogenic risk factors</u>			
Foster care placement	1.41 (0.66 – 3.05)	1.40(0.68 – 2.88)	4.10 (1.45 – 11.64)
Gang involvement	1.06 (0.65 – 1.71)	1.18(0.75 – 1.86)	1.25 (0.68 – 2.30)
Negative self-identity	1.03 (1.01 – 1.06)**	1.01 (0.99 – 1.03)	1.00 (0.97 – 1.02)
Substance use versatility	1.04 (0.92 – 1.17)	1.22(1.01 – 1.36)***	1.16 (1.01 – 1.34)*
Parental maltreatment	0.81 (0.71 – 0.93)**	0.97 (0.89 – 1.07)	0.92 (0.78 – 1.09)
<u>Interaction effects</u>			
Foster care * maltreatment	1.12 (0.96 – 1.30)	1.05 (0.94 – 1.17)	1.06 (0.88 – 1.27)
Model fit	-2LL = 1577.55; $\chi^2$ = 126.94; $p < 0.001$ ; Nagelkerke pseudo $R^2$ = 0.19		

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Note. Low rate offenders used as reference category; <sup>a</sup> 'White' used as reference group