Child Maltreatment across the Life-course: Links to Youth Offending

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Abstract

The links between child maltreatment and youth offending are widely accepted, but little understood (Stewart, Livingston, & Dennison, 2008). Maltreated children are at increased risk of offending, yet, the majority of maltreated children do not offend (Stewart et al., 2008). Research efforts directed at examining and explaining the links between maltreatment and offending have typically been hampered by overly simplistic operationalisations of child maltreatment. Specifically, researchers have often failed to account for the heterogeneous nature of maltreatment experiences across the life-course, and the impact of maltreatment dimensions such as type, chronicity, timing, frequency and multi-type maltreatment (Herrenkohl & Herrenkohl, 2009; Maas, Herrenkohl, & Sousa, 2008). The primary aim of this thesis was to examine the links between child maltreatment and youth offending with consideration of the heterogeneous and complex nature of child maltreatment across childhood and adolescence, within the broader developmental system and historical context.

This thesis was informed by developmental systems theory and developmental and life-course criminology. There were three propositions central to this thesis. First, in order to progress maltreatment and offending research, researchers must consider child maltreatment temporally, across all of childhood and adolescence, with simultaneous consideration of maltreatment dimensions, such as the timing, type, frequency and chronicity of the maltreatment, as well as the experience of multi-type maltreatment. Second, consideration must be provided to the potential impact of jurisdiction and historical context on observed maltreatment and offending links. Third, in Australian research, consideration must be provided to the potentially differential maltreatment experiences and offending outcomes of Indigenous Australian children and young people compared to non-Indigenous Australian children and young people.

There were two primary research questions addressed by this thesis: Research Question 1: Which maltreatment dimensions are related to youth offending? and Research Question 2: Do the links between maltreatment dimensions and youth offending change across cohorts? These two research questions were addressed via three separate, yet interrelated studies using linked, longitudinal administrative datasets.
from Queensland, Australia. The data reflected formal contacts with the child protection system from birth to the end of adolescence, and contacts with the youth justice system. The primary cohort dataset, the QLD90 dataset (N=4511), represented young people born 1990. Across the studies, the results of analyses using the QLD90 cohort dataset were compared to previously published equivalent analyses using the pre-existing QLD83 cohort dataset (children born 1983) (Stewart, Dennison, & Waterson, 2002) and the QLD83/84 cohort dataset (children born 1983 and 1984) (Stewart, Dennison, & Hurren, 2005; Stewart et al., 2008). Using three analytic methods on a single dataset allowed a comprehensive response to the research questions.

In Study 1, using the methodology of Stewart et al. (2002) and Stewart et al. (2005), the QLD90 administrative dataset was analysed using binary logistic regression, to determine whether offending outcomes could be predicted from maltreatment experiences. The model included 10 predictor variables, sex (female/male), Indigenous status (not Indigenous/Indigenous), age at first substantiation, age at final substantiation, emotional abuse (no/yes), neglect (no/yes), physical abuse (no/yes), sexual abuse (no/yes), number of notifications, and number of substantiations. The outcome variable was dichotomous (no conviction/conviction). The full model including 10 predictor variables was statistically significant, χ² (10, N = 4478) = 646.20, p < .001. The results indicated a higher risk of offending associated with neglect, increasing age at final substantiation, increasing number of notifications, and for males and Indigenous youth. There was a lower risk of offending following sexual abuse. An additional model replacing ‘age at first substantiation’ and ‘age at final substantiation’ with alternative developmental variables of maltreatment timing, namely early childhood (yes/no), middle childhood (yes/no), and adolescence (yes/no), indicated that adolescent maltreatment was a significant predictor of youth offending, while early childhood and middle childhood maltreatment were not (χ² (11, N= 4478) = 660.99, p<.001).

The results of the QLD90 analyses in Study 1 were largely consistent with previously published results from the QLD83 dataset (Stewart et al., 2002) and the QLD83/84 dataset (Stewart et al., 2005), with the most important variation noted for physical abuse. For the QLD83 and QLD83/84 cohorts, physical abuse was a significant predictor of youth offending, but for the QLD90 cohort it was not. Possible explanations for this difference were discussed, with particular consideration of the changing
historical context surrounding the Queensland child protection system and impacts on administrative data.

In Study 2, using the methodology of Stewart et al. (2008), the QLD90 dataset was subjected to the semi-parametric group-based method of trajectory analysis (Nagin, 2005), to identify distinct maltreatment trajectories distinguishable by maltreatment timing and frequency over the life-course. Six distinct maltreatment trajectories were identified, with each one resulting in different rates of offending. The results highlighted a link between maltreatment trajectories with a maltreatment peak at transition points, or coinciding with adolescence, and offending. Importantly though, these high offending trajectories were also characterised by high maltreatment frequency, chronicity, the experience of multi-type maltreatment, and an overrepresentation of Indigenous youths. Previously published equivalent analyses of the QLD83/84 dataset (Stewart et al., 2008) also noted six maltreatment trajectories. Across the QLD90 trajectories and the QLD83/84 trajectories there were a number of similar features and some points of variation. Importantly, the results of Stewart et al. (2008) indicated different degrees of overlap between maltreatment dimensions in high offending trajectories and offending outcomes.

In Study 3 the QLD90 dataset was subjected to conjunctive analysis of case configurations (Miethe, Hart, & Regoeczi, 2008) to assist in exploring overlap across maltreatment dimensions (chronicity, timing, frequency, and type), and their shared and unique impact on youth offending. The results were complex, and indicated overlap between maltreatment frequency, chronicity, and multi-type maltreatment. The results also indicated that different maltreatment types may have a different impact on offending, depending on the developmental period in which they are experienced. Perhaps most importantly, the results indicated alternative links between maltreatment dimensions and offending for males compared to females and Indigenous youths compared to non-Indigenous youths, highlighting potential value in developing four subgroups, Indigenous females, non-Indigenous females, Indigenous males and non-Indigenous males, for future analyses.

In the final chapter of this thesis, the results of the three studies are discussed with reference to the primary research questions and existing literature. Additional discussion is provided with reference to the strengths and limitations of the
methodology and analytic strategy of this thesis. Taken together, the results of the three studies of this thesis have important implications for policy and practice, theory, and future research. In particular, the results of this thesis highlight the need for additional research on the links between maltreatment and offending, with particular consideration of the potential for complex interactions between maltreatment dimensions and offending, which may vary as a function of gender and race.
Statement of Originality

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Emily J. Hurren Paterson

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Chapter One: Introduction

As argued by Herrenkohl and Herrenkohl (2009) the broadening of our collective understanding of child victimisation has “...often occurred without refining existing methods and integrating available evidence” (p. 485). While the links between child maltreatment and youth offending are widely accepted, research efforts directed at understanding these links have been hampered by inadequate and overly simplistic conceptualisations of child maltreatment (Herrenkohl & Herrenkohl, 2009; Maas et al., 2008). There is ample research evidence demonstrating the complex and heterogeneous nature of child maltreatment over the life-course. Yet, research examining the links between maltreatment and offending has typically rested upon examinations of single maltreatment types or other maltreatment dimensions and their effects in isolation (Herrenkohl & Herrenkohl, 2009; Maas et al., 2008). The primary aim in this thesis is to examine the links between child maltreatment and youth offending with consideration of the heterogeneous and complex nature of child maltreatment across childhood and adolescence, within the broader developmental system and historical context.

The empirical research article which is widely considered the first to directly acknowledge and label childhood maltreatment was published 1962 by Kempe, Silverman, Steele, Droegmueller and Silver (1962, reprinted in Donnelly & Oates, 2000). Arguably, Kempe et al. (1962, reprinted in Donnelly & Oates, 2000) should be credited with providing the earliest empirical insight into the complex and heterogeneous nature of childhood maltreatment through consideration of maltreatment dimensions such as frequency, timing, and multi-type maltreatment. In their article, Kempe et al. (1962, reprinted in Donnelly & Oates, 2000) coined the term “the battered-child syndrome”, and specified:

The battered-child syndrome may occur at any age, but, in general, the affected children are younger than 3 years. In some instances, the clinical manifestations are limited to those resulting from a single episode of trauma, but more often the child’s general health is below par, and he shows evidence of neglect including poor skin hygiene, multiple soft tissue injuries, and malnutrition [emphasis added]. (p. 13)
Clearly, Kempe and colleagues (reprinted in Donnelly & Oates, 2000) indicated in 1962 that maltreatment could include a single event or multiple events, a single type (physical abuse) or multiple types (physical abuse and neglect; sexual abuse and emotional abuse were not yet recognised) and could occur at any age. Furthermore, in recognising “A marked discrepancy between clinical findings and historical data, as supplied by the parents...”, in the same article, Kempe et al. (1962, reprinted in Donnelly & Oates, 2000, p. 13) may also have provided the earliest comments on the limitations of self-report data in child maltreatment research.

Despite these early indications from Kempe et al. (1962, reprinted in Donnelly & Oates, 2000) regarding the heterogeneous nature of child maltreatment, research consideration of heterogeneous maltreatment experiences has been limited. Following Kempe et al.’s (1962, reprinted in Donnelly & Oates, 2000) article, researchers often relied on dichotomous groupings of maltreated children versus non-maltreated children (Herrenkohl & Herrenkohl, 1979, cited in Herrenkohl, 2005), with limited consideration of the impact of particular maltreatment types or dimensions. In later periods, researchers often examined single maltreatment types, and their effects, in isolation, with physical abuse receiving growing attention in the 1960s, followed by sexual abuse in the 1980s, and neglect then emotional abuse (including exposure to family violence) in the 1990s (Child Family Community Australia, 2015). It is important to acknowledge that a significant proportion of maltreated children experience multiple maltreatment experiences, of varying types and severity across the life-course. As described by Finkelhor, Ormrod, and Turner (2007a, p. 9) “for some victimized children, victimization is more of a “condition” than an “event”…”.

Treating maltreatment as a unidimensional variable prevents researchers from determining which dimensions of maltreatment, in isolation or combination, share the strongest link with offending (English, Upadhyaya, et al., 2005; Herrenkohl & Herrenkohl, 2009). This in turn restricts intervention and prevention efforts. In order to develop a better understanding of the links between child maltreatment and youth offending, it is important to consider all types of maltreatment experienced across the life-course of individuals, as well as the severity, chronicity, frequency and timing of these experiences (English, Upadhyaya, et al., 2005; Herrenkohl & Herrenkohl, 2009; Maas et al., 2008).
Some researchers continue to argue the merits of examining distinct maltreatment types in isolation. Widom (2013), for example, has argued the value of focusing on individual maltreatment subtypes (particularly neglect) in research instead of grouping all subtypes together under the broader category of child maltreatment, due to the risk that researchers may “...miss differences in causes or consequences or even success in treatments or interventions” (pp. 5-6). Importantly, this argument appears to be based on the assumption that researchers cannot account for multiple maltreatment subtypes or dimensions, while simultaneously accounting for the unique contribution of each, to any outcome. This thesis is based on an alternative assumption, that the use of modern analytic methods allows simultaneous consideration of multiple maltreatment dimensions alongside examination of their unique effects.

The primary theoretical influences in this thesis are developmental systems theory (DST) and developmental and life-course criminology (DLC). Each of these influences considers development across the life-course with particular acknowledgment of the complex nature of the many potential influences on individual development over time (Farrington & Loeber, 2013; Lerner, 2002). Both DST and DLC acknowledge complex interactions between various factors within individual, relational and social levels, such as family groups, peer groups, educational institutions, neighbourhoods, communities and political and historical context (Farrington & Loeber, 2013; Lerner, 2002). These theoretical influences highlight the likelihood of complex links between maltreatment and offending, and the range of factors that may influence observed maltreatment and offending links. Both perspectives indicate that the links between developmental experiences and outcomes are best understood through temporal, longitudinal data (Farrington & Loeber, 2013; Lerner, 2002).

Importantly, both DST and DLC perspectives assume limited generalisability of results from single sources of data, due to variability across individuals, societies, racial/ethnic groups, and historical contexts (Farrington & Loeber, 2013; Lerner, 2002). To date, much of the available research regarding childhood maltreatment and offending has been drawn from various jurisdictions across the USA and UK. The generalisability of these international results to the Australian context of maltreatment and youth offending is unclear. Additionally, extending beyond general jurisdictional differences, a challenge specific to Australian jurisdictions is the chronic overrepresentation of Indigenous Australian children and young people in the child protection and youth
justice systems. There is a need for a larger body of Australian research on maltreatment and offending links, particularly in order to provide a point of comparison with international results as well as insight into the experiences and needs of maltreated Indigenous Australian children compared to maltreated non-Indigenous Australian children.

Finally, as noted above, DST and DLC acknowledge that developmental systems are embedded in a particular historical context (Farrington & Loeber, 2013; Lerner, 2002). The potential impact of historical context is important to consider in research on maltreatment and offending links. As described, above, from the 1960s to the 1990s maltreatment research moved from a predominant focus on physical abuse to a focus on sexual abuse, followed by neglect and emotional abuse (Child Family Community Australia, 2015). Likewise, child protection systems, interventions, community awareness and maltreatment reporting changed and developed considerably over time. It is important to consider whether research findings pertaining to older cohorts of maltreated children remain generalisable to newer cohorts of maltreated children. The potential impact of historical context on observed maltreatment and offending links is an important point of focus in this thesis.

There are three propositions that are central to this thesis. First, in order to progress maltreatment and offending research, researchers must consider child maltreatment temporally, across all of childhood and adolescence, with simultaneous consideration of maltreatment dimensions, such as the timing, type, frequency and chronicity of the maltreatment, as well as the experience of multi-type maltreatment. Second, consideration must be provided to the potential impact of jurisdiction and historical context on observed maltreatment and offending links. Third, in Australian research, consideration must be provided to the potentially differential maltreatment experiences and offending outcomes of Indigenous Australian children and young people compared to non-Indigenous Australian children and young people.

Based on the information presented in this chapter, there are two primary research questions addressed by this thesis: Research Question 1: Which maltreatment dimensions are related to youth offending? and Research Question 2: Do the links between maltreatment dimensions and youth offending change across cohorts? These two research questions are addressed in this thesis via three separate, yet interrelated
studies. The primary longitudinal, linked dataset used across the three studies of this thesis represents individuals born 1990 who had any recorded contact with the Queensland child protection system between birth and 18 years of age, and/or any contact with the Queensland youth courts for a criminal matter between the ages of 10 years (minimum age of criminal responsibility in Queensland) and 17 years (the final year before entering Queensland’s adult criminal justice system). All recorded formal contacts with either of these systems across the specified timeframe, for each individual, are included in the dataset. This dataset is referred to throughout this thesis as the QLD90 cohort dataset. The QLD90 dataset allows temporal examination of the effects of several maltreatment dimensions on observed maltreatment and offending links.

Across the three studies in this thesis, the QLD90 dataset is subjected to three different analytic methods. Based on the method of Stewart, Dennison and Waterson (2002) and Stewart, Dennison and Hurren (2005), in Study 1, the dataset is subjected to binary logistic regression to determine whether offending outcomes can be predicted by maltreatment experiences, gender and Indigenous status. Based on the method of Stewart, Livingston and Dennison (2008), in Study 2 the dataset is subjected to the semi-parametric group-based method of trajectory analysis to identify distinct maltreatment trajectory groups distinguishable by maltreatment timing and frequency. These trajectory groups are examined to identify links to offending, and distribution of maltreatment dimensions. Influenced by the research of Miethe, Hart, and Regoeczi (2008), in Study 3, the dataset is subjected to an exploratory application of Conjunctive Analysis of Case Configurations (Miethe et al., 2008). The aim of Study 3 is to delineate the unique and shared impact of each maltreatment dimension, gender and Indigenous status on youth offending outcomes of Indigenous Australian and non-Indigenous Australian youths.

The use of three modern analytic methods on a single dataset allows extensive and comprehensive examination of a variety of maltreatment dimensions, and their links to youth offending. Each analytic method is expected to make a unique contribution to understanding the links between maltreatment and offending, and identification of the maltreatment dimensions which are related to youth offending. Together these three studies provide a comprehensive response to Research Question 1: Which maltreatment dimensions are related to youth offending?
The use of Australian data in this thesis provides a point of comparison with existing international research on maltreatment and offending links, which enables examination of the generalisability of existing international literature to the Australian context, alongside consideration of the experiences of Indigenous Australian youths compared to non-Indigenous Australian youths. Though no research questions are proposed here regarding Indigenous status, an important aim of this thesis is to examine the impact of this key variable on observed maltreatment and offending links in Australian data.

In Study 1 and Study 2, the results obtained from analysis of the QLD90 cohort dataset are compared to previously published results of Stewart et al. (2002), Stewart et al. (2005) and Stewart et al. (2008) who performed equivalent analyses on older cohort datasets pertaining to individuals born 1983 and 1984, referred to in this thesis as the QLD83 and QLD83/84 combined cohort datasets. The comparison of results obtained using the QLD90 cohort with results obtained using the QLD83 and QLD83/84 cohort datasets allows examination of the effects of historical context on observed maltreatment and offending links, thereby providing a response to Research Question 2: Do the links between maltreatment dimensions and youth offending change across cohorts?

In sum, through the completion of the three studies described above, this thesis contributes to current knowledge by examination of data directly relevant to Australia, allowing a point of comparison with international results. This thesis also extends current knowledge regarding the impact of maltreatment timing, frequency and type, as well as the impact of Indigenous status, which is of particular importance within Australian jurisdictions. Finally, this thesis provides insight into the effects of historical context on observed maltreatment and offending links, by comparing results for the three birth cohorts, thereby highlighting the challenges associated with generalising from existing literature in this area.

There are seven remaining chapters in this thesis. A brief overview of the theoretical framework for this thesis is provided in Chapter Two. The focus remains on developmental systems theory and developmental and life-course criminology. A critical review of existing empirical literature regarding the links between child maltreatment and youth offending is presented in Chapter Three. Particular focus is
provided to challenges to empirical research on this topic. An overview of the overarching methodology and analytic strategy of this thesis is provided in Chapter Four. The overview includes a description of the datasets in use in this thesis, basic descriptive data for each, and a discussion of the historical context surrounding the datasets. Studies 1, 2 and 3 of this thesis are presented in Chapters Five, Six and Seven, respectively. Chapter Eight, the final chapter of this thesis, includes a general discussion of the results of each of the three studies of this thesis, followed by arguments regarding the implications of these results for theory, policy and practice, and recommendations for future research.
Chapter Two: Theoretical Framework

2.1 Chapter Overview

This chapter includes an introduction and overview of the primary theoretical influences in this thesis, namely, developmental systems theory and developmental and life-course criminology. The aim of this chapter is to discuss and define the key elements of these theoretical influences, and identify their relevance to research regarding the links between child maltreatment and youth offending. Developmental systems theory is summarised first, followed by developmental and life-course criminology. This chapter is concluded with a brief summary of the joint contribution of these theoretical influences to this thesis.

2.2 Developmental Systems Theory

Numerous models, theories, or “instances” fit within the “...broader set of dynamic, person-context relational models termed developmental systems theory” (Lerner, 2002, p. xvii). These models seek to identify the many complex and varied factors which, together, impact on individual development. Developmental systems theory (DST) perspectives share four key components, which Lerner (2002) terms (1) relationism and the integration of levels of organisation, (2) change and relative plasticity, (3) historical embeddedness and temporality, and (4) the limits of generalisability, diversity, and individual differences. These four components are discussed next.

2.2.1 Relationism and the integration of levels of organisation.

At the core of DST is the assumption that individuals simultaneously exist within numerous levels of organisation. As specified by Lerner (2002), an individual’s “...development is embedded within an integrated matrix of variables derived from multiple levels of organization...” (p. 186). Lerner (2002) describes these levels as the individual level, which includes biological and psychological factors, the proximal social-relational level, which includes relationships with family, friends and peers, the
**social-cultural** level, which includes institutions such as education, government, policy, and economic systems, and lastly the **natural and designed physical ecology** (Lerner, 2002, p. 187). It is assumed that each of these levels contributes to an individual’s development.

Developmental systems perspectives argue that the functioning of any variable from any level of organisation should be understood with regard to its relation with variables from other levels of organisation (Lerner, 2002). For example, individual differences may have direct influence on developmental outcomes, but may also impact development via effects on family interactions. In particular, development is seen to derive from dynamic relationships among the variables within and between each level of organisation (Lerner, 2002). Consequently, a young person’s development is affected by their individual differences on a biological and psychological level, as well as their interactions with family, friends, school, work, neighbourhood, community, government, and historical context, which embodies social and political change (Lerner, 2002).

### 2.2.2 Change and relative plasticity.

In developmental systems perspectives *change* is considered possible at all points across the life-course and in each level of organisation. Importantly, individuals and their various levels of organisation are believed to share bidirectional relationships, which means each level of organisation can affect and be affected by the others. Change can occur within and across levels. Though change can occur to different degrees at different times, relative plasticity, or the ability to change, is assumed to always exist (Lerner, 2002). As identified by Dennison (2011), this is not only relevant for methodology, but policy and prevention planning also. Likewise, Lerner (2002) argued that this acknowledgment of change and relative plasticity should encourage researchers to consider the entire life-course, and search for elements of individuals and their contexts that can be effectively incorporated into, or considered in the design of, positive development policies and programs.
2.2.3 Historical embeddedness and temporality.

Developmental systems perspectives view history as the broadest level of the developmental system (Lerner, 2002). All other levels of organisation are integrated with, or occur within the context of historical change, meaning that change is necessary and inevitable, and that the structure and function of variables change over time (Lerner, 2002). Due to this historically embedded change, consideration of human development must occur in temporal order.

A temporal examination of development provides a greater opportunity to understand how development occurs. There is potential variation in the impact of particular factors over the life-course of individuals, as well as variation to the impact of factors on individuals within different historical periods. Importantly, examination of development and change requires a variety of data sources and samples, quantitative and qualitative methodologies, and a variety of analytical techniques, described by Lerner (2002, p. 189) as “...multiple occasions, methods, levels, variables, and cohorts”.

2.2.4 The limits of generalisability, diversity, and individual differences.

The final component of developmental perspectives is the assumption of limited generalisability due to diversity and individual differences. As succinctly stated by Lerner (2002, p. 191) “What is seen in one data set may be only an instance of what does or what could exist. Accordingly, contemporary systems theories focus on diversity – of people, relations, settings, and times of measurement”. Variations can exist across all levels of organisation, including historical periods (Lerner, 2002). Hence, there is a need to consider diversity across time and place, as well as racial/ethnic and cultural diversity (Lerner, 2002). The application of DST to the examination of maltreatment and offending links is discussed in greater detail in Section 2.4 of this chapter.

2.3 Developmental and Life-course Criminology

Developmental and life-course criminology (DLC) complements DST as a theoretical influence in this thesis. As summarised by Farrington and Loeber (2013, p. 227) “...(DLC) is concerned mainly with three topics: (1) the development of offending
and antisocial behaviour from the womb to the tomb; (2) the influence of risk and protective factors at different ages; and (3) the effects of life events on the course of development”.

DLC uses concepts which complement DST, in order to describe and explain criminal offending across the life-course. Importantly, DLC seeks to explain criminal offending at the individual level, rather than the group level (Farrington, 2003). An ultimate goal of DLC is the development of effective crime prevention and intervention methods (Tanner-Smith, Wilson, & Lipsy, 2013). There are numerous theories that fit within the broader category of DLC (Farrington, 2005), and many of these theories seek to explain youth offending from a developmental systems approach (Dennison, 2011). For the purposes of this thesis, however, only the broader and more common components of DLC are discussed here, as these broader components represent the principal influence of DLC in this thesis.

2.3.1 Risk and protective factors.

As listed above, DLC perspectives seek to describe and explain offending over the life-course, including its onset, prevalence and desistance. In doing so, DLC also seeks to identify the factors which are associated with an increased risk of offending (risk factors), as well as those which are associated with a decreased risk of offending (protective factors), over the life-course. As with DST, DLC perspectives tend to highlight the interaction between the individual, and the various levels of the developmental network. As listed by Tanner-Smith et al. (2013), risk factors for criminal offending can be allocated amongst five different domains, including individual factors, family factors, peer factors, school factors and community factors, which are assumed to vary in their influence across the life-course. There are clear similarities between these five domains identified within DLC and the individual, proximal social-relational, and social-cultural levels identified in DST.

DLC perspectives tend to assume that risk and protective factors may have differential impacts at different developmental points along the life-course, and in different domains (Tanner-Smith et al., 2013). For example, factors in the family domain are assumed to have greater impact during childhood and adolescence (Tanner-Smith et al., 2013). Factors associated with child maltreatment are widely
acknowledged within DLC perspectives as risk factors for offending, particularly offending which occurs prior to adulthood. As specified by Farrington and Loeber (2013, p. 230), family factors, such as “...poor parental supervision, harsh discipline and child physical abuse, inconsistent discipline, a cold parental attitude and child neglect, low involvement of parents with children, parental conflict, broken families, criminal parents, delinquent siblings...” are well known risk factors for offending prior to 20 years of age (Farrington & Loeber, 2013).

Importantly, it is not only the presence or absence of a risk or protective factor throughout the life-course that matters, but the timing at which these are present or absent. DLC perspectives also acknowledge the possibility that risk factors have a cumulative effect, meaning that the greater the number of risk factors present, the greater the risk (Tanner-Smith et al., 2013). Hence, consistent with DST, DLC highlights the importance of longitudinal and temporal research (Le Blanc & Loeber, 1998). This is particularly due to DLC’s dual focus on both describing within-individual changes in offending across the life-course, and identifying the different causal factors associated with offending in different periods (Le Blanc & Loeber, 1998).

Lastly, in addition to the five risk domains identified above, life-course criminologists have identified the potential impact of “macro-level events” on individual development (Sampson & Laub, 1995, p. 9). There is marked similarity between the concept of macro-level events in DLC and the concept of historical embeddedness in DST. As explained by Sampson and Laub (1995, p. 9), in research driven by DLC, “...individual lives are studied though time, with particular attention devoted to aging, cohort effects, historical context, and the social influence of age-graded transitions”. Clearly, it is important to consider changes within and across cohorts, and factors within the historical context which may assist in explaining these variations.

### 2.3.2 Trajectories, transitions and turning points.

Related to the above observations regarding the timing of risk and protective factors, DLC perspectives make continued reference to trajectories, transitions, and turning points throughout the life-course. As described by Sampson and Laub (1995), trajectories are typically long-term behavioural patterns or developmental pathways
which occur over the life-span. For example, researchers may refer to offending trajectories, which represent the pattern of offending over the individual’s life-course, including observations of its onset, prevalence and desistance. Transitions are short term, and relate to life events that take place at any point along the trajectory (Sampson & Laub, 1995). An example may be an individual starting primary school or secondary school, or entering the work force. Turning points tend to represent interactions between trajectories and transition points, and refer to an event or series of events which result in significant change in the life-course or a significant altering of the trajectory (Sampson & Laub, 1995). An example of a turning point may include marriage, entering parenthood, or the experience of child maltreatment.

An important component relating to examinations of transitions and turning points is the assumption that the developmental period in which these occur, will affect their influence on the life-course. In the words of Elder (1998, p. 3) “...the developmental impact of a succession of life transitions or events is contingent on when they occur in a person’s life”. This observation relates to “…the social meanings of age throughout the life course…” (Sampson & Laub, 1995, p. 9). For example, becoming a parent in early adolescence is likely to have a different impact from becoming a parent in adulthood.

Similar to DST perspectives, Elder (1998) highlighted the potential effects of social structure and culture on factors such as family interactions, which can in turn influence individual behaviour. Elder (1998), for example, specifically identified the likely differences between individuals who grew up during the Great Depression and those in contemporary America, and highlighted the need to examine “...human life and development in different time and places....” (p. 2). Likewise, Laub and Sampson (1993, p. 319) highlighted the need to consider “…the interaction of turning points with the varying structural locations and historical contexts within which individuals make the transition to youth adulthood”. In addressing these key components of DLC, researchers have recommended the use of explicit cohort comparisons (Laub & Sampson, 1993), as well as comparisons of males and females, and different racial and ethnic groups in different countries (Farrington & Loeber, 2013, p. 244).
2.4 DST and DLC Perspectives Applied to Child Maltreatment and Youth Offending in this Thesis

As highlighted above, child maltreatment is a widely accepted risk factor for youth offending. However, as illustrated by both DST and DLC, the links between child maltreatment and youth offending are likely to be complex. At the broadest level, DST and DLC perspectives are applied in this thesis to illustrate the likelihood that complex processes underlie, surround and influence observed links between child maltreatment and youth offending. In this thesis DST and DLC are used to guide understanding of the potential processes influencing the links between maltreatment and offending, which informs selection of research variables and analytical techniques.

As described by Petersen, Joseph, and Feit (2014)

...factors relating to the individual child and to the familial and social contexts in which the child lives, as well as the severity, chronicity, and timing of abuse and neglect experiences, all conspire to impact, to varying degrees, the neural, biological, and behavioural sequelae of abuse and neglect (p. 111).

Research informed by DST and DLC must consider interactions between many factors within and across different levels of organisation, as well as across time and place. As this thesis relies upon administrative data from child protection and youth justice systems to explore maltreatment and offending links, consideration of many levels of organisation is prevented. Nonetheless, several key components from DST and DLC are incorporated in this work.

Both DLC and DST acknowledge the potential for variations in research results across jurisdictions. As discussed in the introduction of this thesis, much research regarding maltreatment and offending links has emerged from the USA and the UK. By focusing on Australian data and comparing the results to previously published international studies, this thesis allows examination of the generalisability of international results to the Australian context, and vice versa.

Extending beyond general jurisdictional variations, a particularly important feature of this thesis is examination of maltreatment and youth offending links among Indigenous Australian youths compared to non-Indigenous youths. Both DLC and DST encourage consideration of racial/ethnic diversity. This is especially relevant to the
Australian context due to the significant overrepresentation of Indigenous Australian young people within the child protection and youth justice systems, and the markedly different risk factors confronting Indigenous Australians compared to non-Indigenous Australians (Australian Institute of Health and Welfare, 2015b) (discussed further in Chapter Three, Section 3.3.2).

As observed in DST and DLC perspectives, it is expected that variation will exist from one data source to another. In particular, there is potential for the effects of risk and protective factors to change over time and across cohorts, particularly due to the broader level of social change and historical context. Based on observations of the changing nature of child protection systems and child protection research over time, this thesis prioritises examination of historical context and its effects on observed maltreatment and offending links. The impact of historical context is examined in this thesis via comparison of observed maltreatment and offending links across the QLD83, QLD83/84, and QLD90 datasets, which represent separate birth cohorts from Queensland, specifically, young people born 1983, 1984 and 1990. An illustration of the historical context surrounding the child protection system of these cohorts is provided in Chapter Four (section 4.4).

Consistent with DST and DLC recommendations, in this thesis longitudinal data are used to temporally consider all recorded maltreatment experiences from birth to the end of adolescence. The potential for cumulative risk resulting from the experience of multi-type maltreatment types and/or multiple maltreatment events over the life-course is also considered in this thesis, alongside examination of the impact of maltreatment timing, frequency, severity and chronicity on observed maltreatment and offending links. Based on observations of DST and DLC regarding the need to consider gender differences, potential differences in experiences and outcomes of maltreated males compared to maltreated females are also considered in this thesis. Both DST and DLC acknowledge the value of using multiple methods to explore developmental processes and outcomes. The use of three distinct analytic methods across the three studies of this thesis allows extensive and comprehensive examination of maltreatment and offending links, which assists in identifying the maltreatment dimensions which share the strongest links with youth offending.
As noted above, an underlying assumption throughout this thesis is that the links between child maltreatment and offending are likely to be extremely complex. It is accepted that child maltreatment, while significant, is not the only risk factor for youth offending. The links between maltreatment and offending are likely to be far more complex in the wider developmental system when factors such as school achievement, homelessness, resilience, and mental illness are taken into consideration as potential confounding, mediating, or moderating variables. As the impact of variables from the broader developmental system cannot be examined in this thesis due to the nature of the administrative data, all results presented throughout this thesis are interpreted with acknowledgement of the limits of generalisability.

Lastly, based on the acknowledgement of plasticity and change, a motivating factor in this research is the expectation that well timed, targeted interventions may assist in breaking the links between maltreatment and offending. It is hoped that identification of the maltreatment experiences or dimensions which share the strongest links with offending, will assist development of effective intervention efforts.

2.5 Link to Chapter Three

The next chapter provides a review of empirical research concerning child maltreatment and its links to youth offending. Particular attention is provided to the challenges associated with empirical research on this topic. There are important overlaps between the available empirical literature concerning the links between child maltreatment and youth offending, and the theoretical influences presented thus far in this thesis. These overlaps, which influenced the selection of research questions and methodologies within this thesis, are highlighted and discussed throughout Chapter Three.
Chapter Three: The Complex Nature of Child Maltreatment: Empirical Research and Methods

3.1 Chapter Overview

The links between child maltreatment and youth offending are widely accepted, but little understood. As identified in the preceding chapters, child maltreatment is not a unidimensional phenomenon, and yet, much of the research examining the links between maltreatment and offending has focussed on single maltreatment types or dimensions, and their effects, in isolation. In order to develop a deeper understanding of the links between maltreatment and offending, it is necessary to consider the heterogeneous and complex nature of maltreatment temporally across childhood and adolescence. In particular, it is necessary to consider maltreatment dimensions, as well as the potential impact of the broader developmental context surrounding maltreatment experiences, including jurisdiction and historical context.

The purpose of this chapter is to review empirical literature demonstrating the heterogeneous nature of child maltreatment across childhood and adolescence. First, challenges associated with adequate conceptualisations of child maltreatment are discussed via examination of maltreatment dimensions and the experience of multi-type maltreatment as well as poly-victimisation. Second, contextual factors surrounding maltreatment research, are discussed. Here the focus remains on historical context and jurisdictional variation, with particular consideration of the overrepresentation of Indigenous Australian youths in Australian child protection systems. Third, challenges associated with conducting child maltreatment research are discussed with particular focus on the strengths and limitations of the many data sources and research methodologies available to researchers. This discussion assists in providing a rationale for the selected methodology and analytic strategy of this thesis. Fourth and finally, a critical review of existing research regarding maltreatment and offending links is presented, followed by separate consideration of existing research from Queensland, Australia which guided the methodology of this thesis. This chapter is concluded with a revision of the research questions and links to the methodology and analytic strategy employed across the three studies of this thesis.
3.2 The Heterogeneous Nature of Child Maltreatment

As asserted throughout this thesis, child maltreatment across childhood and adolescence is heterogeneous and complex (English, Upadhyaya, et al., 2005; Herrenkohl & Herrenkohl, 2009). In this section, challenges associated with defining and conceptualising child maltreatment and its dimensions are discussed, thereby providing an illustration of this complexity and heterogeneity.

3.2.1 Definitions of child maltreatment.

Over three decades ago Besharov (1981) commented that definitions of abuse and neglect in child maltreatment research were insufficient and lacked “(1) comparability, (2) reliability, and (3) taxonomic delineation” (p. 384). Researchers continue to express concerns about inadequate and inconsistent definitions in current child maltreatment research (Cicchetti & Manly, 2001; Gough, 1996; Petersen et al., 2014; Portwood, 1999; Runyan et al., 2005). This is a very important issue because maltreatment definitions have a far-reaching impact on many aspects of research, including “the reliability and validity of maltreatment statistics, research findings and conclusions, reporting, intervention strategies, and key policy decisions” (Portwood, 1999, p. 56). In other words, maltreatment definitions influence our knowledge of the prevalence of maltreatment, its causes and consequences, and methods of prevention and intervention.

The difficulty in determining consistent or universal definitions of child maltreatment and its subtypes can be attributed to a number of different factors. Embodied in the concept of child maltreatment are the concepts of parental rights and responsibilities, family autonomy, the role of the State, the rights of the child, and the best interests of the child compared to minimum standards of care (Aries, 1962; Goldstein, Freud & Solnit, 1973; Nelson, 1984; all cited in Barnett, Manly, & Cicchetti, 1993). Philosophies regarding the rights and responsibilities of the State to intervene in the family unit can impact on definitions of maltreatment. In discussing this situation in the USA for example, Cicchetti and Toth (1995) commented that liberal philosophies, which view the State as primarily responsible for protecting the rights of the child, may result in broad definitions of child maltreatment. Alternatively, conservative
philosophies, which emphasise the family’s right to privacy, may result in more restricted definitions of maltreatment (Goldstein et al., 1973; cited in Cicchetti & Toth, 1995). Furthermore, cross-cultural differences can have a large impact on assessments of standards of care for children (Korbin, 1991), as can socioeconomic status (Shor, 2000). Barnett et al. (1993) describe these impacts as a “transaction among cultural attitudes, political trends, economic forces, family well-being, and definitions of child maltreatment” (p. 10).

Gough (1996), provided an alternative point of focus, and argued that much of the variation in definitions of child maltreatment and its subtypes can be attributed to inconsistent interpretations of harm and responsibility. Interpretations of maltreatment could be based on the act itself and behaviours of the parent, or alternatively, on the outcome of the act for the child (Gough, 1996). Certain behaviours may be labelled maltreatment based on the severity of the harm suffered by the child regardless of the severity of the act itself (Gough, 1996). Further, maltreatment could be assessed based on the intention of the actor, the capacity of the actor, the responsibility of the actor for their actions, or the identity of the actor (Gough, 1996). Consistent with many of the arguments of Gough (1996), in the USA, the National Research Council (NRC) (1993, cited in Portwood, 1999, p. 65) identified seven factors which may potentially influence maltreatment definitions, namely “consequences of the act (endangerment vs. demonstrable harm), severity of the act(s); frequency of acts; culpability of the perpetrator; intent to harm; developmental level of the child; and cultural factors”. Clearly there are many factors restricting the development of reliable, valid, and generalisable maltreatment definitions.

3.2.2 Definitions of child maltreatment subtypes.

Despite extensive variation in operational definitions of child maltreatment, there are four subtypes of child maltreatment which are typically recognised within the literature, namely, neglect, physical abuse, sexual abuse (or sexual exploitation), and emotional abuse (or psychological abuse). As with broader definitions of maltreatment, there is large variability in how maltreatment subtypes can be interpreted, defined, explained and recognised. For example, as many as 19 different subtypes or subcategories of child neglect have been identified previously in the literature.
(Harrington, Zuravin, DePanfilis, Ting, & Dubowitz, 2002). Straus and Kantor (2005) highlighted numerous approaches to the definition and measurement of neglect. They noted opportunities to consider parental behaviour including causes and effects versus harm to the child, different subscales of neglect, children’s appraisals of the behaviour, the severity and chronicity of the neglect, the development of the child and timing of the neglect, community standards, and the use of multiple data types and sources. Clearly, the factors which influence definitions of the broader concepts of child maltreatment have equal impact on definitions of the narrower subtypes of maltreatment.

Within Australia there are eight States and Territories, and each one has separate legislation designed to provide for the protection of children residing in that State or Territory (Australian Institute of Health and Welfare, 2008; Bromfield & Higgins, 2004). These legislative Acts vary with regards to definitions of maltreatment, specified mandated reporters of maltreatment, and particular processes for responding to that maltreatment (AIHW, 2008; Bromfield & Higgins, 2004). These variations result in inconsistencies across Australian jurisdictions in reported maltreatment prevalence rates (AIHW, 2008; Bromfield & Higgins, 2004).

As this thesis relies on administrative data from Queensland, Australia, it is useful to provide an indication of definitions provided by the Queensland child protection system. Table 3.1 presents basic definitions provided by the Queensland child protection department for each maltreatment subtype, alongside comparative definitions for these same maltreatment subtypes which are provided by the Australian Institute of Health and Welfare (AIHW). The AIHW is a government agency tasked with providing up-to-date statistics and information on the health and welfare of Australians (Australian Institute of Health and Welfare, 2015a). These definitions are provided here to provide a general understanding of each maltreatment subtype considered in this thesis, as well as the minor variations evident across available operational definitions. Importantly, the government department responsible for child protection in Queensland has clarified that child maltreatment “...can be a single incident, or can be a number of different incidents that take place over time.” (Queensland Government, 2015b).
### Definitions of maltreatment subtypes as provided by the Department of Communities Queensland and the Australian Institute of Health and Welfare (AIHW)

<table>
<thead>
<tr>
<th>Subtype</th>
<th>AIHW*</th>
<th>Department of Communities, Queensland#</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neglect</strong></td>
<td>“Any serious acts or omissions by a person having the care of a child that, within the bounds of cultural tradition, constitute a failure to provide conditions that are essential for the healthy physical and emotional development of a child” (p. 129).</td>
<td>“Neglect occurs when a child's basic necessities of life are not met, and their health and development are affected.”</td>
</tr>
<tr>
<td><strong>Emotional abuse</strong></td>
<td>“Any act by a person having the care of a child that results in the child suffering any kind of significant emotional deprivation or trauma. Children affected by exposure to family violence would also be included in this category” (p. 127).</td>
<td>“Emotional abuse occurs when a child's social, emotional, cognitive or intellectual development is impaired or threatened. It can include emotional deprivation....”</td>
</tr>
<tr>
<td><strong>Physical abuse</strong></td>
<td>“Any non-accidental physical act inflicted upon a child by a person having the care of a child” (p. 131)</td>
<td>“Physical abuse occurs when a child has suffered, or is at risk of suffering, non-accidental physical trauma or injury... Physical abuse does not always leave visible marks or injuries. It is not how bad the mark or injury is, but rather the act itself that causes injury or trauma to the child....”</td>
</tr>
<tr>
<td><strong>Sexual abuse</strong></td>
<td>“Any act by a person, having the care of a child, that exposes the child to, or involves the child in, sexual processes beyond his or her understanding or contrary to accepted community standards” (p. 132).</td>
<td>“Sexual abuse occurs when an adult, stronger child or adolescent uses their power or authority to involve a child in sexual activity... Sexual abuse can be physical, verbal or emotional....”</td>
</tr>
</tbody>
</table>

Sources: * (Australian Institute of Health and Welfare, 2014); # (Queensland Government, 2015b)

### 3.2.3 Dimensions of child maltreatment.

In addition to recognition of distinct maltreatment subtypes, there is a need to consider other dimensions of maltreatment which affect research definitions, responses and outcomes of maltreatment. The Maltreatment Classification System (MCS) (Barnett...
et al., 1993) provided an early identification of a range of potentially important maltreatment dimensions. In part, the MCS was developed to address the need for greater clarity and specificity in maltreatment definitions, alongside an additional goal of identifying the aspects of children’s experiences that were most likely to affect their development (Manly, 2005).

Within the original MCS, Barnett et al. (1993) identified six broad maltreatment dimensions, namely, subtype (physical abuse, sexual abuse, physical neglect, emotional maltreatment, and moral/legal/educational maltreatment), severity (1=low to 5=high, meaning how serious the maltreatment was, ranging from less serious to life threatening), frequency/chronicity (number of reports to child protection/number of months of active involvement from child protection), the developmental period of the child (accounting for the chronological age of the child and their mastery of developmental issues), separations and placements of the child (meaning of the history of the separations the child has had from their parents or guardians), and the perpetrator of the maltreatment (meaning the identity of the individual who committed the maltreatment). Though the MCS has been used widely in child maltreatment research (Manly, 2005), maltreatment dimensions are often operationalised differently across studies, and considered in isolation, rather than simultaneously (Litrownik et al., 2005). For example, a modified version of the MCS (MMCS) was developed for use in The Longitudinal Studies of Child Abuse and Neglect (LONGSCAN) study, and differed with regards to coding of developmental periods, and operationalisation of chronicity (English, Bangdiwala, & Runyan, 2005).

Éthier, Lemelin, and Lacharité (2004), defined chronic maltreatment as cases when the maltreatment continued over an extended period of time. This was contrasted with transitory maltreatment, which referred to cases where, following intervention, the maltreatment decreased or ceased over time (Éthier et al., 2004). Comparatively, English, Graham, Litrownik, Everson and Bangdiwala (2005) explored three different characterisations of ‘chronicity’ in their research, which aimed to predict emotional and behavioural functioning in a sample of maltreated children at eight years of age. The first characterisation or definition of chronicity, simply considered the frequency of maltreatment, or in other words, used a simple count of the number of maltreatment incidents reported and age at first report (English, Graham, et al., 2005). The second characterisation of chronicity, referred to as ‘developmental’, considered the occurrence
of maltreatment in relation to the developmental stages of infancy, toddlerhood, preschool, and early school age (English, Graham, et al., 2005). The third definition of chronicity, referred to as ‘calendar’, considered the occurrence of maltreatment in relation to calendar years (English, Graham, et al., 2005). The latter two characterisations of chronicity had five levels: situational (maltreatment occurring in only one time period, meaning only one developmental stage or one calendar year), limited episodic (maltreatment occurring in two time periods, with intervening periods of no maltreatment), limited continuous (maltreatment occurring in two consecutive time periods), extended episodic (maltreatment occurring in three or more time periods, with intervening periods of no maltreatment) and extended continuous (maltreatment occurring in three or more consecutive time periods) (English, Graham, et al., 2005). The authors determined that the different characterisations of chronicity, had varying levels of sensitivity for determining impact on three outcome domains, namely behaviour, adaptation and trauma symptoms (English, Graham, et al., 2005).

Relatedly, the impact of maltreatment timing has been explored in different ways across studies. Thornberry, Ireland and Smith (2001) examined the impact of maltreatment timing on multiple problem outcomes and considered three developmental periods, namely early childhood (birth to five years of age), late childhood (ages six to 11 years) and adolescence (ages 12 to 17 years). Comparatively, Thornberry, Henry, Ireland and Smith (2010) considered two developmental periods, namely childhood (birth to 11 years of age) and adolescence (ages 12 to 17 years).

Litrownik et al. (2005), considered four alternative ways of operationalising maltreatment severity, and then determined the predictive validity of these four severity variables with regards to a range of outcome dimensions. Their four approaches to operationalising severity included ‘maximum severity by type’ where researchers recorded the highest severity rating for each maltreatment type present in a case, ‘overall maximum severity’ where researchers utilised only the highest severity rating recorded in each case (regardless of the maltreatment type it applied to), ‘total severity’ where researchers summed the maximum severity ratings for all maltreatment types present in a case, and ‘mean severity’ where researchers calculated the mean severity rating, calculated from each of the highest severity ratings (if over 1) of each type of maltreatment (Litrownik et al., 2005). For each operationalisation of severity, the researchers utilised the (1=low to 5=high) rating of severity outlined by Barnett et al.
(1993). Litrownik et al. (2005) identified that the four operationalisations of severity had varied predictive utility regarding a variety of outcome domains (Litrownik et al., 2005). Taken together, the above information demonstrates the importance of clarity in operationalisation of maltreatment dimensions, and the potential impact of varied operationalisation of maltreatment dimensions on research results.

In a study designed to measure the impact of maltreatment dimensions (type, severity, chronicity, and age at first report) on outcomes for maltreated children, English, Upadhyaya, et al. (2005) concluded that maltreatment dimensions are interrelated, and interact to affect the outcomes of maltreated children. They also concluded that the effects of these dimensions on children’s outcomes are heterogeneous (English, Upadhyaya, et al., 2005). In another study, Manly, Kim, Rogosch, and Cicchetti (2001), examined the impact of developmental timing, subtype, and severity of maltreatment on child adaptation. They determined varying impacts of severity and chronicity depending upon the developmental period in which the maltreatment occurred (Manly et al., 2001). Importantly, Manly et al. (2001) noted interplay among developmental timing, maltreatment severity and maltreatment subtypes. They highlighted the need to examine the interplay between maltreatment dimensions to better understand variations in outcomes of maltreated children (Manly et al., 2001). Likewise, Litrownik et al. (2005, p. 554) highlighted the “...importance of studying the heterogeneity of maltreatment along [maltreatment] dimensions”. Clearly, researchers need to ensure that their methodology allows consideration of as many maltreatment dimensions as possible, as well as complex interactions between these dimensions and maltreatment outcomes. As argued by Manly (2005, p. 438), “With such improvements in methodology, researchers will be better able to understand the dynamic nature and heterogeneity of children’s experiences and to elucidate the processes of adaptation in the face of adversity”.

3.2.4 Multi-type maltreatment.

Until relatively recently many researchers treated maltreatment subtypes, and associated samples of affected children as distinct. While some researchers highlight the need to separately consider each distinct maltreatment subtype, and account for the unique impacts of each, other researchers highlight the reality of extensive overlap
between maltreatment subtypes and the experience of these over the life-time. The experience of multiple maltreatment types has been interchangeably referred to as multi-type maltreatment, co-occurrence, and co-morbidity in the literature (Herrenkohl & Herrenkohl, 2009). In their review of the literature, Herrenkohl and Herrenkohl (2009) determined that the experience of multi-type maltreatment is common among maltreated children. Likewise, Lau et al. (2005) compared three studies which estimated the prevalence of multi-type maltreatment experiences in official data and identified a prevalence range between 46% and 90%.

Despite its widespread experience, multi-type maltreatment is rarely considered in empirical research (Herrenkohl & Herrenkohl, 2009). Importantly, this may result in an inaccurate understanding of children’s maltreatment experiences, as well as a limited understanding of the real consequences of maltreatment and its subtypes, as well as intervention and prevention (Herrenkohl & Herrenkohl, 2009). As identified in the review by, Manly (2005, p. 430), “...before concluding that any particular subtype carries unique detrimental effects, the interplay among multiple subtypes and multiple maltreatment dimensions must be considered”. Herrenkohl and Herrenkohl (2009), and Lau et al. (2005) have posed similar arguments.

It cannot be denied that maltreatment experiences over the life-course are heterogeneous and complex, and many children experience multiple maltreatment types over the life-course. As argued by Berzenski and Yates (2011, p. 250), participants in research which pertains to the experience and outcomes of a single maltreatment type “...may not be representative of the typical maltreated child”. Berzenski and Yates (2011) acknowledged that research on specific maltreatment types can improve understanding of developmental pathways, but argued that research which examines multi-type maltreatment would be more clinically and empirically valid. Importantly, Buckley, Tonmyr, Lewig and Jack (2014), have argued that the uptake of research evidence by child welfare practitioners is affected by the degree to which the research is “...practical and capable of application...” (p. 12). Research which simultaneously accounts for multiple maltreatment dimensions, may lead to research conclusions and recommendations with greater policy relevance, and direct applicability for child protection practitioners.
Similar to the general challenges associated with establishing a definition of maltreatment, the identification of the experience of multiple maltreatment types is restricted due to the variety of sample sources, data sources and variables considered by researchers (Herrenkohl & Herrenkohl, 2009). To explore the possibility of multiple distinct maltreatment classes, for example, Armour, Elklit, and Christoffersen (2014), used latent class analysis on interview data for a sample of Danish citizens born 1984. They identified four maltreatment classes. Class one was primarily characterised by psychological maltreatment, class two was primarily characterised by sexual abuse and contained an overrepresentation of females, class three was primarily characterised by high probabilities of multiple maltreatment types including physical abuse, psychological maltreatment, neglect and sexual abuse, and finally, class four was primarily characterised by the absence of maltreatment.

Alternatively, Berzenski and Yates (2011) used Latent Class Analysis to examine the impact of different patterns of maltreatment on self-reported psychopathology and conduct problems among college students, but relied upon retrospective self-reports, excluded consideration of neglect, and clustered individuals into groups based on similar patterns of maltreatment experiences. These authors did not account for the timing, frequency of severity of maltreatment. Berzenski and Yates (2011) compared four multiple-maltreatment classes, including a “violent home” class primarily characterised by the experience of domestic violence alongside physical abuse, a “hostile home” class, primarily characterised by the experience of emotional abuse and domestic violence exposure, a “harsh parenting” class primarily characterised by emotional abuse and physical abuse, and finally, a “sexual abuse” class which was characterised by the experience of sexual abuse, and almost chance experience of domestic violence exposure, physical abuse and emotional abuse. Variations across operationalisations of multi-type maltreatment may affect research results regarding this important variable.

Berzenski and Yates (2011) conceptualised existing multiple-maltreatment literature according to two distinct approaches, namely, cumulative risk models and interactive models. According to these authors cumulative risk models assume that risk increases alongside the number of maltreatment types experienced, regardless of type. Alternatively, interactive models assume that different combinations of maltreatment types produce different outcomes, regardless of number (Berzenski & Yates, 2011, p.
Overall, Berzenski and Yates (2011) identified worse psychopathology outcomes for individuals who experienced emotional abuse alone, or in combination with another maltreatment type, compared to any other isolated maltreatment type or multiple-maltreatment class. There were no similar consistent patterns for conduct outcomes, though the worst conduct outcomes were evident for the “harsh parenting” class.

Importantly, Berzenski and Yates (2011) also identified gender effects, whereby emotional abuse was particularly salient for females, yet cumulative risk was more evident amongst males, regardless of maltreatment type, though physical abuse was also salient for males’ conduct problems. The authors hypothesised that emotional abuse may exert a greater negative impact on females due to its impact on sense of self-worth. Berzenski and Yates (2011) concluded that:

...it may be empirically and clinically profitable to embrace and understand these unique and qualitatively distinct patterns, rather than to simply acknowledge the experience of multiple types of adversity, or to assign participants to groups based on potentially arbitrary hierarchical valuations of experiences (p. 258).

LeRoy, Mahoney, Boxer, Gullan, and Fang (2014) examined the joint and separate impact of verbal aggression and physical aggression on adolescents, and described the available literature regarding the combined experience of these two maltreatment subtypes as “... surprisingly scarce...scant and inconsistent...” (p.894). Importantly, these authors concluded that co-occurring verbal and severe physical aggression, perpetrated by the mother, produced more behaviour problems amongst adolescents than when either of these abuse types was experienced alone, yet these interaction effects were absent when the perpetrator was the father (LeRoy et al., 2014). Rather, verbal aggression from the father produced more behaviour problems than severe physical aggression by the father (LeRoy et al., 2014). Hence, the results of LeRoy et al. (2014) indicate the importance of considering the experience of multiple maltreatment types, as well as the identity of the perpetrator.

In an important Australian study, (Higgins, 2004b) performed secondary data analysis of Australian retrospective adult and parent self-report data from three prior studies (Higgins & McCabe, 1998, 2000b, 2003, cited in Higgins, 2004b). Via cluster analysis, Higgins (2004b) demonstrated the limited value of classifying individuals according to distinct maltreatment types due to the prevalence of multi-type
maltreatment. Specifically, Higgins (2004b) highlighted the greater value of classifications based on maltreatment frequency and/or severity, namely high, moderate and low levels of maltreatment. Importantly, via planned comparisons Higgins (2004b) identified lower levels of psychological adjustment among moderate and high maltreatment groups compared to low maltreatment groups.

According to the Child Protection Australia 2013-14 report (Australian Institute of Health and Welfare, 2015b), among children and young people who had contact with Australian child protection systems in the 2013-14 financial year for substantiated maltreatment, there was considerable co-occurrence between maltreatment types. In this government report, co-occurrence referred to cases in which, at the time of notification, an additional maltreatment type was recorded alongside the primary maltreatment type, and does not represent cases in which a different primary maltreatment type was recorded from one notification to the next. Australia wide, the most commonly reported primary maltreatment type was emotional abuse, followed by neglect, then physical abuse and sexual abuse. Interestingly, in cases of co-occurrence, co-occurrence between physical abuse and emotional abuse was common (46.9%), as was co-occurrence between emotional abuse and neglect (30.4%).

The information presented in this section lends support to researchers who have argued the need to determine whether the outcomes for children who experience multi-type maltreatment are different from children who experience no maltreatment, only one maltreatment type, or varying combinations of maltreatment types. Additionally, the information presented throughout this section highlights the need to account for interplay between maltreatment dimensions. As identified by Herrenkohl and Herrenkohl (2009, p.494), it is important to consider the severity of each experience of each maltreatment type, as well as the timing, chronicity, and co-occurrence versus singular occurrence of each type.

3.2.5 Poly-victimisation.

According to Finkelhor et al. (2007a), a particular weakness of much research regarding the negative effects of child victimisation, is the isolated focus that is placed on single types of victimisation. Isolated focus on single types of victimisation results in a failure to take account of the combined impact of all forms of victimisation that the
research subjects have experienced (Finkelhor et al., 2007). In other words, researchers have “failed to obtain complete victimization profiles” (Finkelhor et al., 2007, p. 8).

The Juvenile Victimization Questionnaire (JVQ) is a measure designed to account for poly-victimisation in young people, and enables researchers to account for 34 forms of offences, which can be divided into five categories of victimisation, namely, “Conventional Crime, Child Maltreatment, Peer and Sibling Victimization, Sexual Victimization, and Witnessing and Indirect Victimization” (Finkelhor, Ormrod, Turner, & Hamby, 2005, p. 1300). Additionally, the JVQ incorporates data regarding perpetrator(s), injury, trauma symptoms, and co-occurrence of victimisations (Finkelhor et al., 2005), which is complementary to the broader concepts of maltreatment dimensions.

Using the JVQ, Finkelhor et al. (2005) found that 71% of young people had experienced at least one victimisation type, and 69% of these had experienced at least one other. When poly-victimisation was classified as the experience of four or more different victimisation types in a year, 22% of children could be classified as poly-victims (Finkelhor et al., 2005). Of these poly-victims, 7% were high poly-victims who had experienced 7 or more victimisation events, and 15% were low poly-victims who experienced between 4 and 6 victimisations (Finkelhor et al., 2005). Interestingly, “high poly-victims were more likely to come from lower socio-economic status homes, reside in one-parent households, be older, and have higher rates of other adverse life-events. Their victimizations were also more likely to include an injury, a weapon, a caregiver perpetrator, and a sex offence than those of low poly-victims” (Finkelhor et al., 2005, p.1302).

Perhaps most importantly, Finkelhor et al. (2005) found that poly-victimisation had greater predictive power than any single victimisation type, with regards to trauma symptoms, and in particular, “…it is primarily poly-victims, not all the victims in any individual category of victimization, who are manifesting symptomatology” (p.1309). Further, using a national sample of 1467 children in the United States of America, Finkelhor, Ormrod and Turner (2007c), found that children who had been victimised in one year, were significantly more likely to be re-victimised in the following year, either via the same type of victimisation or a different type of victimisation. Poly-victims, namely those children who had experienced four or more types of victimisation in one
year, were at particularly high risk of poly-victimisation persisting into the next year (Finkelhor et al., 2007c).

Generally, research accounting for poly-victimisation has typically demonstrated that for some children, victimisation is ongoing and takes many forms across the life-course. In the words of Finkelhor et al. (2007a, p. 9), “for some victimized children, victimization is more of a “condition” than an “event”…”. The work of Finkelhor and colleagues provides strong empirical illustration of several of the theoretical concepts presented in Chapter Two regarding the relevance of the broader developmental system to child maltreatment and offending links. Importantly, poly-victimization has a differential impact on developmental outcomes compared to single types of victimisation (Finkelhor, Ormrod, & Turner, 2007b). There is evidence to suggest that poly-victimisation leads to greater impairment or more negative outcomes for affected children than single types of maltreatment (Finkelhor et al., 2007b).

Finkelhor, Ormrod, Turner, and Holt (2009, p. 316) identified four distinct pathways to becoming a poly-victim, namely, “(a) residing in a dangerous community, (b) living in a dangerous family, (c) having a chaotic, multiproblem family environment, or (d) having emotional problems that increase risk behaviour, engender antagonism, and compromise the capacity to protect oneself”. Dangerous families were characterised by family violence, child maltreatment, and frequent arguments between parents and caregivers or parents and children (Finkelhor et al., 2009). Family problems related to homelessness, parental job loss, change or unemployment, varied financial stressors, imprisonment of a parent, parental drug and alcohol problems, parental separation or divorce, and trouble with police, among others (Finkelhor et al., 2009). Finkelhor et al. (2009) determined that (d) was particularly relevant to poly-victimisation onset in younger children, while (a), (b), and (c) were relevant to onset of poly-victimisation in older children. They also determined that poly-victimisation onset often peaked at two key transition points, the onset of elementary school, and the onset of high school. These results have important implications for researchers interested in the impact of maltreatment timing.

In a highly relevant Australian study Price-Robertson, Higgins and Vasallo (2013) performed an empirical comparison of the utility of the multi-type maltreatment and polyvictimisation frameworks with regards to explaining outcomes in early
adulthood. These authors used data from the Australian Temperament Project, a longitudinal community study on the development of a large group of Australians from infancy to adulthood representing numerous waves of self-report survey data. Using these data the authors created measures and subsequent groups to test the impact of multi-type maltreatment (including a no maltreatment group, a single maltreatment group, and a multi-type maltreatment group), polyvictimisation (including a no victimisation group, a single victimisation group, a low polyvictimisation group, and a high polyvictimisation group), and victimisation type (including a no maltreatment or bullying group, a bullying only group, a maltreatment only group, and a maltreatment and bullying group) (Price-Robertson et al., 2013). The early adulthood outcomes of interest included depression, anxiety, illicit substance use, antisocial behaviour and long term health problems (Price-Robertson et al., 2013).

Results regarding the multi-type maltreatment groupings indicated that the risk of anxiety and depression was lowest for the no maltreatment group and highest for the multi-type maltreatment group. Interestingly, there were no significant differences noted across these groups with regards to illicit substance use, antisocial behaviour or long-term health problems. Similarly, the authors noted greater risk for the high polyvictimisation group compared to the other polyvictimisation groups for all outcomes except illicit substance use. Finally, comparisons across the bullying only, maltreatment only, and bullying and maltreatment groups indicated greater risk for individual who experienced both bullying and maltreatment, with increased risk evident across all outcome measures except illicit substance use. Interesting, compared to the no maltreatment or bullying group, the bullying only group were at greater risk of long-term health problems, while the maltreatment only group were at increased risk of illicit substance use. Overall, the work of Price-Robertson et al. (2013) highlights the potential value of both the multi-type maltreatment framework and the poly-victimisation framework for research on the links between maltreatment and youth criminal offending (see also Child Family Community Australia, 2013).

The work of Finkelhor and colleagues highlights important challenges for child maltreatment research, and shares important overlaps with the theoretical framework of this thesis. Specifically, it should be assumed that many maltreated children are poly-victims. It should also be assumed that negative outcomes experienced by some maltreated children may be more accurately attributed to their poly-victimisation, as
opposed to the isolated maltreatment experience under examination. Furthermore, the
timing of maltreatment, and broader victimisation experiences, may affect outcomes of
affected children. Clearly, child maltreatment researchers must use caution when
interpreting results which account only for the experience of child maltreatment across
the life-course and subsequent links to youth offending, in the absence of examination
of poly-victimisation experiences. Reliance on administrative data in this thesis
precludes consideration of the impact of poly-victimisation, and the broader
developmental system, on offending outcomes among maltreated children. Nonetheless,
the importance and potential impact of these variables are acknowledged in
interpretation of the results of the three studies of this thesis.

3.2.6 Summary and Research Question One.

Taken together, the information presented in Section 3.2 has provided indication
of the challenges associated with defining and measuring maltreatment and its
dimensions. Additionally, the information presented here has assisted in conceptualising
the complex and heterogeneous nature of maltreatment, and the potential impact of the
broader developmental system on maltreatment and offending links.

The first key point of focus in this thesis is the need to prospectively consider
maltreatment across the entire life course, with consideration of its complex and
heterogeneous nature, particularly through consideration of numerous maltreatment
dimensions, particularly maltreatment type, timing, frequency, chronicity and the
experience of multi-type maltreatment. Building upon these observations, the first
research question under examination in this thesis is: Research Question 1: Which
maltreatment dimensions are related to youth offending?

The information presented in this thesis with regards to poly-victimisation has
assisted in highlighting the impact of broader victimisation experiences on maltreatment
and offending links. Though poly-victimisation cannot be examined in this thesis due to
reliance on administrative data, the focus of the next section (Section 3.3) is broader
contextual factors relevant to child maltreatment research, namely, jurisdiction and
historical context, which are examined in this thesis.
3.3 Contextual Factors Relevant to Child Maltreatment Research

As described in Chapter Two, the theoretical frameworks of interest in this thesis, DST and DLC, clearly highlight the importance of an individual’s broader developmental system to their individual development. These theories highlight the importance of place and time, or in other words, jurisdiction and historical context. Likewise, Whitaker (2015) expressed an overall aim for child maltreatment researchers to contextualise their results with regards to descriptions of the systems to which data pertain, and the broader context of the maltreatment under examination including the potential impact of ethnicity, and cultural and demographic settings. Whitaker (2015) linked these arguments to the broader issue of balancing the need for internal validity and external validity in child maltreatment research, and the overall need for research which has clear policy and practice implications. In this section, the importance of jurisdiction and historical context to child maltreatment research is discussed.

3.3.1. Historical context.

It is crucial to acknowledge that current day definitions of child maltreatment and its subtypes have evolved over time (Herrenkohl, 2005). As described by Fallon et al. (2010, p. 77) “One of the challenges in measuring the extent of child abuse and neglect is that the constructs underpinning child maltreatment are constantly evolving”. These authors particularly noted changes to the identification and detection of maltreatment, as well responses to maltreatment (Fallon et al., 2010). Cicchetti and Toth (2005) similarly noted that perspectives of acceptable versus maltreating parenting had changed across history and cultures.

In the decades following the publication of Kempe et al.’s (1962, reprinted in Donnelly & Oates, 2000) article, modern child protection systems were established, and maltreatment subtypes gained increased recognition in empirical research. Within Australia, physical abuse received growing attention in the 1960s, followed by sexual abuse in the 1980s, and then neglect followed by emotional abuse (including exposure to family violence) in the 1990s (Child Family Community Australia, 2015). Clearly, from the publication of Kempe et al.’s (1962, reprinted in Donnelly & Oates, 2000) article to the current day, maltreatment research and modern child protection systems have undergone enormous development and change.
Feiring and Zielinski (2011) examined trends in empirical studies published in the journal *Child Maltreatment* from 1996 through 2010. They separated this overall time period into three time brackets, where the first time bracket represented 1996-2000, the second time bracket represented 2001-2005 and the third time bracket represented 2006-2010. Over these three time brackets, Feiring and Zielinski (2011) noted an overall decrease in the number of articles examining sexual abuse, an increase in the number of articles examining physical abuse neglect, and, in the last time bracket, an increase in research on emotional abuse. Overall, sexual abuse received the most research attention, followed by physical abuse, neglect and emotional abuse, respectively. Relatedly, in their review of research from 2000 to 2010, Trickett, Negriff, Ji, and Peckins (2011) highlighted improvement in quantity and quality of recent research compared to earlier research, with regards to a larger number of prospective, longitudinal studies, which examine a range of adolescent outcomes, using better definitions and operationalisation of key variables, and a more complex understanding of maltreatment experiences and their outcomes.

Due to considerable change in maltreatment definitions, recognition, research and modern child protection systems over the last several decades, it is necessary to determine whether historical context has affected observed maltreatment and offending links. In particular, it is necessary to determine whether conclusions drawn from research produced several decades ago, have continued relevance today. The historical context surrounding the three administrative datasets used in this thesis is described in detail in Chapter Four of this thesis.

### 3.3.2 Jurisdiction and overrepresentation of Indigenous Australian young people.

Since much of the current child maltreatment and youth offending literature stems from jurisdictions across the USA and UK, there is a distinct need to consider whether identified trends in the literature adequately reflect the experiences and outcomes of young people in Australia, and particularly Indigenous Australian young people versus non-Indigenous Australian young people.

When describing child protection challenges in New Zealand, Kelly (2011, p. 18) reported “...a complex dynamic of issues arising from colonization, the coexistence
of multiple cultural heritages and the economic challenges of creating and distributing wealth in a small and isolated nation” (Kelly, 2011, p.18). Arguably, the context surrounding child protection in Australia is similar. According to the 2006 Census 44% of Australians were either born overseas, or had at least one parent who was born overseas (Australian Bureau of Statistics, 2009).

The Indigenous population of Australia consists of Aboriginal and Torres Strait Islander peoples, who are collectively referred to as Indigenous Australians. Indigenous Australians represent approximately 3% of the overall Australian population, but represent a slightly higher percentage of the Australian population under the age of 18 years owing to a younger age structure compared to the non-Indigenous population and population growth among other factors (Australian Bureau of Statistics, 2014). For example, in 2006 Indigenous Australians represented 2.5% of the total Australian population, and 4.2% of the total population of Australian children and young people. Of crucial relevance to child protection efforts in Australia, is the significant overrepresentation of Indigenous Australian young people compared to non-Indigenous Australian young people in Australian child protection systems. According to the Child Protection Australia 2013-14 report (Australian Institute of Health and Welfare, 2015b), compared to non-Indigenous Australian children, Indigenous Australian children were, on average, seven times more likely to receive child protection services. This degree of overrepresentation varied across the States and Territories.

In Queensland, during the 2013-14 financial year Indigenous Australian children represented approximately 32.9% of young people receiving a substantiated notification of child maltreatment (Australian Institute of Health and Welfare, 2015b), making them approximately six times more likely than non-Indigenous children to have a substantiated maltreatment event in that financial year. Further, due to the Indigenous status of some children being unknown, child protective services may inadvertently classify an Indigenous Australian child as non-Indigenous, meaning the true percentage of Indigenous Australian children having contact with child protective services in Australia may be higher than the reported percentage (Australian Institute of Health and Welfare, 2008).

Over a decade ago, the Crime and Misconduct Commission of Queensland (2004) released a report which addressed a concern that Indigenous Australian children
received differential treatment from child protection services when compared with non-
Indigenous children. In this report the overrepresentation of Indigenous Australian
children in the child protection system was tentatively attributed to a number of
different factors. These included cultural differences in parenting styles, poverty and
lower socioeconomic status, and the potential impact of the “stolen generations”
whereby crucial parenting techniques and coping mechanisms were not able to be
passed on from parents to children in those affected generations (AIHW, 2000 cited in

Another concern addressed the Crime and Misconduct Commission report
(2004) related to significant underreporting of child maltreatment within Indigenous
communities. The underreporting of maltreatment has been attributed to general
mistrust of the system (particularly due to historical actions of the government with
regards to Indigenous Australian children), fear of retribution, shame, fear of losing a
child from the community, and negative expectations of notification outcomes such as
the expected failure of the system to respond appropriately, or to respond at all (Crime
and Misconduct Commission, 2004).

Finkelhor and Jones (2006) examined changing rates of child maltreatment and
victimisation from 1993 to 2004 in the USA. These authors reported a seemingly
reliable decline in rates of sexual abuse and physical abuse, and a possible, yet less
conclusive, decline in child neglect over this period. Importantly, Finkelhor and Jones
(2006) comprehensively contextualised their observed trends through consideration of
the broader social setting in the USA at the time, with reference to “…demography,
fertility and abortion legalization, economic prosperity, increased incarceration of
offenders, increased agents of social intervention, changing social norms and practices,
the dissipation of the social changes of the 1960s, and psychiatric pharmacology”
(p.685). These observations highlight the need to consider variations over time and
jurisdictions. There is a clear possibility that variations existed between Australia and
the USA with regards to these broader factors during this period of time. Changes to
rates of substantiated maltreatment types over time in Queensland are explored in
Chapter Four of this thesis.

Taking an alternative approach, Breyer and MacPhee (2015) attempted to
determine the impact of community level characteristics, such as social disorganisation,
demographic variables, population density, and conservative religious and political ideology on rates of child maltreatment. In particular, they sought to determine whether counties characterised by religious fundamentalism and political conservatism would produce higher rates of child maltreatment (Breyer & MacPhee, 2015). Contrary to their expectations, Breyer and MacPhee (2015) concluded that population density was the largest predictor of child maltreatment, and hypothesised that this may be due to higher rates of social disorganisation in densely populated areas.

It is important to consider whether jurisdictional variability in child maltreatment research is due to legislative or definitional inconsistencies, or cultural differences, or any number of other variables. As argued by Manly (2005, p. 426), “The range of maltreatment incidents that children experience is wide and varies along multiple dimensions that are interrelated...and set in a context of multiple familial and community risk factors associated with poverty, violence, mental health, and other factors”.

In their review, Maas, Herrenkohl, and Sousa (2008, p. 65) determined that “Few, if any, of the studies reviewed directly examined ethnic differences, although several controlled for ethnic differences in analyses reported”. While it is difficult to produce research which clearly delineates the effects of the many variables associated with jurisdiction and culture, at a minimum this thesis seeks to produce research which is directly relevant to Australian youths and child protection systems. In particular, this thesis considers potential differences between the life-course maltreatment experiences of Indigenous Australian young people and non-Indigenous Australian young people, with particular consideration of the impact of these experiences on youth offending rates by each of these groups.

3.3.3 Summary and Research Question Two.

The information presented in Section 3.3 illustrates the need to consider the potential impact of historical context on observed maltreatment and offending links. Likewise, discussion of challenges unique to the Australian child protection and youth justice systems, particularly regarding the overrepresentation of Indigenous youths, highlights the need for a larger body of research using data reflecting the experiences of Australian children and adolescents.
Hence, the second research question is *Research Question 2: Do the links between maltreatment dimensions and youth offending change across cohorts?* The three studies of this thesis are performed using data pertaining to Australian children and young people, thereby allowing research conclusions and recommendations which are directly relevant to Australian youths and child protection systems. Though not presented here as an additional research question, an important aim of this thesis is to consider the potentially differential maltreatment experiences and youth offending outcomes of Indigenous Australian young people compared to non-Indigenous Australian young people.

### 3.4 Challenges Associated with Maltreatment and Offending Research

The two research questions of this thesis are addressed via three interrelated studies using three separate analytic methods. Each of these studies utilises prospective, longitudinal administrative data from the Queensland child protection and youth justice systems (discussed in detail in Chapter Four). To assist in providing a rationale for this methodology and analytic strategy, the purpose of this section is to discuss the strengths and limitations of the range of data types and research methodologies available to child maltreatment researchers. In this section, discussion relates to official data versus self-report data, retrospective versus prospective studies, and cross-sectional versus longitudinal studies.

#### 3.4.1 Official data versus self-report data.

Childhood maltreatment research is typically performed using either self-report data obtained from affected parents or children, or official data which represents administrative records of individuals’ contact with any child protection system or government department. The selection of either one of these data types affects both the definition and operationalisation of childhood maltreatment, and by extension, conclusions regarding the prevalence and outcomes of maltreatment.

Official data enable calculation of the prevalence of maltreatment in States and Territories by considering all cases which receive child protection intervention. These data allow some examination of the longitudinal trends, or patterns of maltreatment.
subtypes that come to the attention of relevant departments. These data can be compared with broader population data, or census data, to allow conclusions to be drawn about the population as a whole (Stewart et al., 2015). Official data can also be used to compare cohorts and examine historical trends. Lastly, official data allow examination of large amounts of data without the economic and time costs associated with independently collected prospective data (Stewart et al., 2015).

The primary criticism of official data is that they are widely considered to provide an underestimation of maltreatment rates, due to significant underreporting of maltreatment (for example, Gracia, 1995; Kalichman & Craig, 1991), and due to inadequate and widely varying legislative definitions. As argued by Bromfield and Higgins (2004), in some cases official data may also represent an overestimation of maltreatment rates due to the broadening scope of legislation in some jurisdictions. Official data from child protective services may not reflect all actual cases of maltreatment, and therefore, may not reflect actual maltreatment trends and prevalence. Further, official data do not allow researchers to investigate the context of the maltreatment (Stewart et al., 2008). This is because official data do not typically contain information about various aspects of the child’s daily living environment and precursors to any maltreatment.

As stated by Proctor (2012), there is a “...gap between research advances and real-world care” (p. 107). Similarly, Behl, Conyngham, and May (2003, p. 226) highlighted the importance of research populations reflecting populations of maltreated children, to enhance generalisability of results to these maltreated children, and to “...better inform clinicians, researchers, and policy makers.” Importantly, one often ignored benefit of official data is that it represents children whose maltreatment experiences have been recognised, and who are immediately accessible for treatment and intervention efforts. Children who are not yet known to the child protection system cannot easily receive targeted interventions. While it is certainly necessary to continue research efforts aimed at improving recognition and reporting of child maltreatment, in the meantime, interventions could realistically be directed towards children currently in contact with the child protection system.

The typical alternative to official data, is self-report data. Self-report data enables qualitative understanding of the context of maltreatment, and “lived”
experiences of maltreated children. Self-report data can also identify cases of maltreatment which never came to the attention of child protection services and are therefore not included in official statistics. However, the use of self-report data also has numerous associated problems. For example, self-report data from parents may be affected by honesty, accuracy of recall, motivation, and comprehension (for example, Knight et al., 2000; Manly, 2005). Self-report data from affected children can be affected by these same factors, and the use of this data also introduces a myriad of ethical concerns. These ethical concerns include determining whether the child is old enough to be providing self-reports, whether children can understand the conditions of informed consent, and the need for researchers to report cases of suspected maltreatment arising during research to child protective services, among others (Knight et al., 2000). Retrospective self-report data from adults regarding whether they experienced maltreatment in their childhood, can require participants to recall experiences from several decades prior, and thus can be affected by distorted or inaccurate memories and recall, and therefore can be erroneous (G. W. Brown, Craig, Harris, Handley, & Harvey, 2007).

In addition to the above, due to time and financial burdens associated with the collection of self-report data, studies of this kind often pertain to limited sample sizes or unrepresentative groups (Brooker, Cawson, Graham, & Wattam, 2001), and cross-sectional data, thereby reducing external reliability. Additionally, researchers utilising this form of data may not have adequate definitions of maltreatment, and may fail to adequately define these for research participants (Brooker et al., 2001) resulting in inconsistent or inaccurate reports. On the balance of these strengths and weaknesses, preference is often given to official data in child maltreatment research. However, researchers who make use of these data must acknowledge associated limitations in their research.

Brownell and Jutte (2013) have argued the merits of a contemporary research methodology which seeks to address the limitations associated with purely quantitative and purely qualitative research design. Specifically, these authors argue the value of linked population-wide databases pertaining to unique individuals “...across services and over time...” (Brownell & Jutte, 2013, p. 120). These authors highlight the potential of this approach to contribute positively to maltreatment research methodologies. They believe the strengths of this approach, namely “...large and unbiased samples, objective
measures, comprehensive long-term follow-up, continuous data collection, and relatively low expense” (Brownell & Jutte, 2013, p. 120), outweigh potential limitations, namely missing data from non-reported maltreatment, limited choice regarding available research variables, and typically limited data associated with precursors to maltreatment and socioeconomic status (Brownell & Jutte, 2013).

Overall there are benefits and limitations associated with all sources of data in maltreatment and offending research. This thesis uses linked administrative data as it enables a prospective, population-based life-course examination of maltreatment and its links to youth offending, as well as examination of the potential impact of historical context. The associated limitations relate especially to likely differences between administrative records and lived-experiences of maltreatment due to problems associated with recognition and reporting of maltreatment and Departmental policies and procedures. The limitations of the data used in this thesis and their impact on interpretation of the results of the three Studies are discussed in more detail in Section 4.5 of the methodology chapter of this thesis and throughout the final discussion chapter (Chapter 8).

3.4.2 Prospective versus retrospective data.

Similar to choice points regarding self-report and official data, researchers can choose between retrospective and self-report data. Retrospective research has some associated strengths. First, by using retrospective data, researchers are not typically required to follow-up with their samples over long periods of time, and in “real time” (Cohen, Deblinger, Mannarino, & de Arellano, 2001), which can save time, money and other resources. Second, the use of retrospective data can enable researchers to avoid ethical issues, such as the need to report child maltreatment that is found to be occurring at the time that the research is taking place (Cohen et al., 2001), which can inhibit accurate reports from participants. Despite these strengths of retrospective methodologies, researchers continue to call for prospective childhood maltreatment research (Cohen et al., 2001; Smith, Ireland, & Thornberry, 2005; Stewart et al., 2005; Zingraff, Leiter, Johnsen, & Myers, 1994).

Researchers have identified a number of benefits of prospective research. First, retrospective data can exaggerate the links between childhood maltreatment and certain
developmental outcomes (Stewart et al., 2005; Zingraff et al., 1994). For example, when research samples of criminal offenders are used, large percentages of participants retrospectively report a history of childhood maltreatment (Stewart et al., 2005; Zingraff et al., 1994). These results can appear to demonstrate a very strong link between childhood maltreatment and criminal offending. Yet, when research samples of maltreated children are used prospectively, the results tend to show that while maltreatment does share a significant relationship with criminal offending, often the majority of maltreated children do not go on to experience psychopathology or engage in criminal offending (Stewart et al., 2005; Zingraff et al., 1994). Thus, prospective data allows for a more accurate examination of the complex links between maltreatment and subsequent developmental outcomes.

Second, retrospective research often relies upon participants’ self-reports to determine a childhood maltreatment history (Widom, 1989; cited in Stewart et al., 2005). As discussed above, self-report data, particularly retrospective self-report data, can be inaccurate and unreliable due to impaired memory or participant biases. Prospective research can counteract this problem. Third, prospective methodologies better equip researchers to consider additional risk and protective factors associated with maltreatment, and its links to negative developmental outcomes (Stewart et al., 2005).

3.4.3 Longitudinal versus cross-sectional data.

In line with the call for more prospective research in the child maltreatment field, researchers have noted the need for longitudinal research to replace cross-sectional research (Higgins & McCabe, 2001; Kaufman & Widom, 1999; Runyan et al., 1998; Widom & Ames, 1994, cited in Stewart et al., 2005). There are a number of reasons for this. First, as demonstrated in the preceding literature reviews, maltreatment experiences and the effects of these on child outcomes are heterogeneous and complex (English, Upadhyaya, et al., 2005). More recent research has also begun to highlight the importance of timing of maltreatment on developmental outcomes (for example, Stewart et al., 2008). Based on this understanding, researchers have often argued that maltreatment needs to be understood across the entire life-course (English, Upadhyaya,
et al., 2005), which can be better achieved via longitudinal research as opposed to cross-sectional research.

In addition to the above, longitudinal data also allow for an increased understanding of maltreatment dimensions such as onset, intensity, frequency, duration, timing, and chronicity of maltreatment (English, Bangdiwala, et al., 2005). Longitudinal data also allow for an examination of factors preceding, and following maltreatment, thereby reducing temporal ambiguity which could be problematic in cross-sectional data (Widom & Ames, 1994; cited in Stewart et al., 2005). Lastly, longitudinal data allow researchers to test and establish causal relationships (Kaufman & Widom, 1999). In comparison, cross-sectional research tends to be correlational in nature, resulting in limitations of specific causal inferences that can be made (Higgins & McCabe, 2001).

### 3.4.4 Summary.

The arguments provided above share considerable overlap with the theoretically informed observations provided in Chapter Two of this thesis, regarding the need for multiple sources and multiple measures. As succinctly argued by Runyan et al. (2005, p. 474), “Any single data source is limited in its ability to fully capture children’s maltreatment experiences”. Nonetheless, it can be also be argued that there are numerous benefits of using linked longitudinal, prospective, official data from multiple sources of official data. The nature of the datasets used in this thesis across Studies 1, 2 and 3, are discussed in detail in Chapter Four of this thesis.

The remainder of this chapter presents a critical review of existing literature on the links between child maltreatment and youth offending.

### 3.5 Existing Research on Child Maltreatment and Youth Offending Links

The purpose of this section is to build upon the information presented thus far in this chapter regarding the nature of child maltreatment and associated research challenges, by drawing together currently available empirical literature on the links between child maltreatment and youth offending. This critical review of available literature is used to guide the conduct of the three studies of this thesis, and aid
interpretation of the results of these studies. Though this literature review is not exhaustive, it does present an adequate range of available research.

It is important to note here that there are many challenges associated with defining and operationalising youth offending. Many of the challenges discussed above regarding definitional challenges associated with child maltreatment also apply to youth offending. Like child maltreatment, youth offending is a complex and heterogeneous phenomenon. In their review of literature regarding the links between maltreatment and youth violence perpetration, for example, Maas et al. (2008) found measures of youth violence ranged from self-report to official records of violence, could include less serious forms or more serious forms of violence, and often accounted for different age ranges. Likewise, these authors found that measures of child maltreatment ranged between official records and self-reports, and retrospective and prospective measures, and often accounted for segments of childhood, rather than the entire childhood (Maas et al., 2008). Overall, Maas et al. (2008) noted variability across the reviewed studies in relation to data sources, definitions and operationalisation of variables, and selected methods of data analysis.

Of particular interest in this thesis is youth offending which results in a conviction prior to the age of 18 years. Clearly, this definition is bound by legislative definitions and jurisdictionally dependent youth justice policies and procedures. Nonetheless, in order to provide a worthwhile review of available literature, in this section research utilising a range of operationalisations of youth offending is reviewed. As a result, generalisability and comparability across these studies, and to the results of this thesis, must be acknowledged.

As described throughout this chapter, maltreatment dimensions are rarely considered together in empirical research. In this section, therefore, literature regarding the impact of separate maltreatment dimensions on youth offending is reviewed under a series of subheadings. In subsection 3.5.1, empirical research regarding the links between maltreatment type and offending is reviewed. Subsection 3.5.2 includes a review of research regarding the links between maltreatment timing and offending. Subsection 3.5.3 includes a review of research regarding the links between maltreatment frequency, severity and chronicity. Subsection 3.5.4 reviews research regarding the impact of gender and ethnicity on maltreatment and offending links, while subsection
3.5.5 includes a review of research regarding the potential impact of non-maltreatment variables on maltreatment and offending links. This literature review is concluded in subsection 3.5.6, which includes a summary of the key conclusions from the preceding subsections.

3.5.1 The impact of maltreatment type on maltreatment and offending links.

In this section, seven studies on the impact of maltreatment type on maltreatment and offending links are reviewed. Attention is provided to the operationalisation of key variables in each study and observed maltreatment and offending links. This section is concluded with a summary of consistencies and inconsistencies across the results of these seven studies, and the implication of these for this thesis.

Mersky and Reynolds (2007) examined the links between child maltreatment and violent delinquency, using data from the Chicago Longitudinal Study (CLS). The data included substantiated child maltreatment and juvenile court records for 1,404 disadvantaged African American, Latino and other minority children born 1979 and 1980. The authors considered the impact of neglect and physical abuse experienced prior to age 12 years. Offending outcomes were classified in five different ways, including a dichotomous measure of any violent petition as a youth, a dichotomous measure of violent petitions comparing individuals with a single petition with individuals of two or more petitions, a continuous measure of total number of violent petitions, a dichotomous measure of any offending as a youth or adult, and a dichotomous measure of exclusive non-violent offending.

A particular aim of Mersky and Reynolds (2007) was to consider maltreatment and offending links through examination of main effects and subgroup effects. Main effects for maltreatment on offending were noted. Maltreated children were more likely than non-maltreated children to have a youth record for violent offending, but not non-violent offending. This increased risk of a violent offending record continued into adulthood. Experiencing any neglect appeared to increase risk for all outcome variables, while experiencing any physical abuse increased risk of all outcome variables except the total number of petitions. Individuals who experienced only neglect were at increased
risk for violent outcomes including having any violent petition as a youth, a higher number of violent petitions when measured continuously, and any violent petition or adult conviction. They were not more likely to have two or more violent petitions when measured dichotomously, or exclusive non-violent petitions. The small number of individuals with substantiated physical abuse (n=34) restricted examination of its unique effects.

In addition to the above main effects, the authors noted a series of subgroup effects. Maltreated males were at higher risk of all violent outcomes, while maltreated females were only at higher risk of a violent petition or adult conviction. However, sex-by-maltreatment interactions were not significant in analyses using the full sample. Similarly, background risk factors appeared to affect offending outcomes. The risk covariates considered by Mersky and Reynolds (2007) included having a guardian who did not complete high school, an unemployed guardian, a mother who was a teenage parent, low socioeconomic status, receipt of public assistance, four or more children in the family, residing in a single parent family, and residing in a neighbourhood with a high rate of poverty.

Among individuals with four or more background risks, maltreatment increased risk of violent offending, but among individuals with fewer than four background risks, maltreatment did not increase risk of violent offending (Mersky & Reynolds, 2007). Again though, maltreatment-by-risk interactions were not significant in analyses of the full sample. Finally, persistent receipt of public assistance (at both eight years of age and 12 years of age), which was interpreted as persistent economic disadvantage, did affect offending outcomes. Maltreated individuals whose family had persistently received public assistance were at greater risk of offending than maltreated individuals with less economic disadvantage.

The results of Mersky and Reynolds (2007) indicate a direct effect of maltreatment on offending, particularly when neglected and physically abused individuals were grouped together in analyses. Importantly, the results of Mersky and Reynolds (2007) highlight the potential for different observations of maltreatment and offending links depending on the outcome variable under examination, for example comparing violent offending outcomes with non-violent offending outcomes. Additionally, their results indicate the need to consider other variables such as gender,
background risk and socioeconomic status which may affect maltreatment and offending links. With regards to the impact of gender on maltreatment and offending links, the results of these authors may indicate the potential for a stronger link between maltreatment and adult offending, than maltreatment and youth offending, among females. Of course, it is important to note that these authors only accounted for neglect and physical abuse occurring prior to the age of 12 years, and did not assess the impact of emotional abuse or sexual abuse.

Yun, Ball, and Lim (2011) examined the links between maltreatment and violent delinquency using data from the National Longitudinal Study on Adolescent Health in the USA. The data were retrospectively collected during young adulthood. Violent delinquency was measured through self-reports of violent acts. The three outcome variables of interest accounted for violence participation, violence frequency and exclusive violence participation (compared to dual offending of violent and property offences). Maltreatment history was established through retrospective self-reports of maltreatment occurring before entering the sixth grade of schooling. Subsamples of physically abused (three or more instances of physical abuse), neglected (10 or more instances of neglect) and sexually abused (any instance of sexual abuse) individuals were formed. Some analyses also grouped all maltreated children together (any substantiated maltreatment) and compared them with non-maltreated individuals (no substantiated maltreatment).

Yun et al. (2011) found maltreated children were more likely than non-maltreated children to commit violent offences, and had higher rates of participation and frequency. Maltreatment in general, and maltreatment subtypes, did not share a significant relationship with exclusive violent offending, indicating that the effects of maltreatment on offending were most likely due to an increased risk of property offences. While controlling for demographic and religiosity covariates, physical abuse had no impact on delinquency, yet sexual abuse and neglect each increased violence participation and frequency. Removal from the home due to maltreatment also increased risk of violence participation and frequency. Other variables showed main effects. In particular, being female, and having a higher household income and private religiosity, reduced risk of violence participation and frequency. Being female and having a higher household income also significantly reduced risk of exclusively violent offending. Public religiosity had no significant impact on violence participation, frequency or
exclusivity. There were no identified interaction effects, indicating that demographic and religiosity variables did not affect maltreatment to offending main effects.

Consistent with Mersky and Reynolds (2007), the results of Yun et al. (2011) highlighted an increased risk of offending amongst maltreated individuals, with both studies accounted only for maltreatment occurring before adolescence. Contrary to Mersky and Reynolds (2007) who found stronger links between maltreatment and violent offending than non-violent offending, Yun et al. (2011) noted stronger links between maltreatment and property (non-violent) offending than violent offending. One possible reason for this variation is that Mersky and Reynolds (2007) used official records of offending, while Yun et al. (2011) used self-reports. Both sets of authors noted direct effects of neglect, and less clear effects of physical abuse on offending. While Mersky and Reynolds (2007) did not examine the impact of sexual abuse, Yun et al. (2011) noted particularly strong links between sexual abuse and offending. Both studies highlighted greater offending risk among maltreated males than females, and both studies indicated increased risk of offending among economically disadvantaged maltreated individuals. Likewise, both studies highlighted the potential impact of non-maltreatment variables on observed maltreatment and offending links.

Swanston et al. (2003) examined the impact of sexual abuse on subsequent juvenile offending, aggression and delinquency. Using a longitudinal design, these authors identified 38 participants aged between four and 15 years who had presented at a hospital in Sydney, Australia, for sexual abuse. The participants were followed-up nine years after initial contact. A control group of 66 non-sexually abused children, who were recruited from various schools local to the area, was utilised in this study. These authors operationalised self-reported delinquency with the Youth Self Report (YSR: Achenbach, 1991; cited in Swanston et al., 2003). Juvenile offending was measured using official data of recorded juvenile criminal convictions. In their analyses, the authors adjusted for age, sex, socioeconomic status, and whether the participant child was residing with their biological parents at intake.

After adjusting for the above control variables, Swanston et al.’s (2003) results showed that sexual abuse was a significant predictor of self-reported juvenile criminal activity, where sexually abused young people reported more juvenile criminal activity than controls. Sexual abuse also affected parents’ ratings of the young person’s levels of
aggression, where sexually abused young people were rated by their parents as more aggressive than the control group. Importantly, sexual abuse did not predict official records of convictions, self-reports of delinquency by young people, parents’ reports of delinquency by the young person, or self-reports of aggressiveness by young people. Consistent with Yun et al. (2011), the results of Swanston et al. (2003) indicate a link between sexual abuse and offending, but the results of Swanston et al. (2003) in particular indicate the need to consider whether official youth offending records provide an adequate representation of actual rates of offending and delinquency by maltreated children compared to self-reported offending.

Other variables were deemed significant by Swanston et al. (2003). Specifically, higher numbers of negative life events in the past year were associated with higher parents’ and young people’s ratings of delinquency, and higher self-report ratings of aggressiveness by young people. Parents’ ratings of family functioning were also associated with delinquency, where lower family functioning related to greater delinquency. Lastly, young people’s ratings of family functioning related to parents’ assessments of the young person’s aggressiveness, where lower family functioning related to higher parental ratings of the young person’s aggressiveness. The results of Swanston et al. (2003) complement the results of Mersky and Reynolds (2007) and Yun et al. (2011) in highlighting the potential impact of non-maltreatment variables on offending by maltreated and non-maltreated individuals.

Siegel and Williams (2003) similarly examined the relationship between sexual abuse and delinquency and crime among 411 females, using a prospective methodology. These authors included 206 females with a recorded history of sexual abuse and a matched sample of 205 females without a recorded history of sexual abuse. The sexual abuse sample had reported to a municipal hospital in the USA between 1973 and 1975 for treatment and collection of evidence following the sexual abuse. The control group had presented to the same hospital for issues unrelated to sexual abuse. Family members were the perpetrators in only one third of the sexual abuse cases.

Official arrest records were obtained for all participants in the year 1995, and included delinquency records from the family court. The outcome measures accounted for both juvenile offences and adult offences. For juvenile offences the outcome variables were dichotomous, and reflected whether the individual had ever been arrested
for any juvenile offence, whether the individual had ever been arrested for a violent or property offence, and lastly, whether the individual had ever been arrested for running away. Siegel and Williams (2003) also considered the impact of being a subject of a dependency hearing on offending. A dependency hearing was treated as a measure of family dysfunction or violence.

Siegel and Williams (2003) concluded that a greater proportion of sexually abused females than non-sexually abused females were arrested for any juvenile offence, arrested for a violent property offence, and arrested for running away. Within group comparisons revealed that sexually abused females were more likely to be arrested for violent offences than property offences. Contrarily, non-sexually abused females were arrested in equal proportions for property and violent offences. Interestingly, running away was more likely when sexual abuse had been perpetrated by an extra-familial offender compared to a familial offender.

After controlling for dependency and race, tests of significance indicated that sexual abuse significantly increased the risk of juvenile violent offending, but did not significantly increase the risk of juvenile general offending. Being the subject of a dependency hearing, and being African American (compared to White) also increased risk of arrest as a juvenile. The effect of sexual abuse continued into adulthood, where women with a history of sexual abuse were at greater risk of arrest for any offending, as were women who had been subject to a dependency hearing. The results indicate that sexual abuse may make a unique contribution to offending, with a particular effect noted for violent offending. The significance of dependency status may indicate the unique contribution of other maltreatment types, though specific maltreatment experiences associated with dependency are unclear in this study.

Zingraff et al. (1994) conducted cross-sectional research in North Carolina, designed to determine how child abuse and neglect affected juvenile delinquency. Zingraff et al. (1994), operationalised “delinquency” as any complaint of delinquency as noted in the first stage of a court process. A random sample of officially reported, maltreated children and a random control group of school children were utilised in this study. Official records of maltreatment were used to establish four groups, physically abused, sexually abused, neglected, and non-maltreated. Multiple-maltreatment was not directly examined in this study, rather, children experiencing more than one type of
maltreatment were divided amongst the above groups depending on the most serious type of maltreatment experienced, using a hierarchy of “physical abuse before neglect before sexual abuse” (Zingraff et al., 1994, p. 74).

The initial results of Zingraff et al. (1994), were as follows: (1) Maltreated children were at significantly higher risk of delinquency than the general population of school children, even after controlling for race, age, gender, and family structure; (2) Amongst the maltreated children, neglected children, followed by physically abused children (especially physically abused boys), were most at risk of delinquency; (3) Sexually abused children were at no greater risk of delinquency than the general population of school children, though Zingraff et al. (1994) noted that this could have been due to the smaller number of cases.

Importantly, Zingraff et al. (1994) specifically sought to determine the mediating effect of good school performance on the abuse, neglect and delinquency relationship. School achievement and performance was measured according to teacher-assigned school grades, scores on the California Achievement Test (CAT), school attendance, and behaviour problems in school. Demographic control variables included race, gender, age and family structure. The extended results of these authors indicated that, regarding independent effects, older children, children living with a parent and step-parent, males, and children living without parents, were at greater risk of delinquency. Additionally, when school outcome variables were included together in analyses, physically abused children were no longer at increased risk of delinquency, suggesting the mediating effect of school achievement. While the magnitude of neglect was reduced with the introduction of school outcome variables, again suggesting the impact of school achievement, neglected children were still significantly more likely to engage in delinquency than the general population of school children. The inclusion of school outcome variables also diminished the impact of age on risk of delinquency. Lastly, children with behaviour problems at school, lower grades, and greater absenteeism were at greater risk of delinquency. Zingraff et al. (1994) concluded that better school performance could reduce the risk of delinquency amongst physically abused and neglected children, though neglected children would still remain at greater risk of delinquency than other maltreated and non-maltreated children.
The results of Zingraff et al. (1994) regarding the greater impact of neglect on offending than other maltreatment subtypes are consistent with the results of Mersky and Reynolds (2007) and Yun et al. (2011). The results of Zingraff et al. (1994), regarding the lack of impact of sexual abuse on official records of offending, are also consistent with the results of Swanston et al. (2003). A comparison of results of Zingraff et al. (1994), Swanston et al. (2003) and Siegel and Williams (2003) indicates that sexual abuse may increase offending behaviour, but this offending may only be observed in self-reports and may not be reflected in official records. It is possible that the difference between self-reports and official records may be attributable to the type or severity of the offending behaviour. Unfortunately, these possibilities cannot be confirmed here using the available research. Comparison of the results of Zingraff et al. (1994), Mersky and Reynolds (2007) and Yun et al. (2011) highlight the need for further examination of the potential links between physical abuse and offending, and the potential impact of operationalisation of key variables on these observed links.

Currie and Tekin (2012) extended examinations of maltreatment and offending links by considering neglect, physical abuse and sexual abuse and their unique relationships with multiple offending outcomes. Data was drawn from the National Longitudinal Study of Adolescent Health, and reflected retrospective self-reported maltreatment consistent with neglect, physical abuse and sexual abuse occurring before entering the sixth grade of schooling, and retrospective self-reports of offending reflecting property crimes, assault, armed robbery, burglary, theft, and hard drug use in the 12 months prior to reporting. Individuals were classified as maltreated if they had experienced 10 or more incidences of neglect or physical abuse and any incident of sexual abuse. The authors attempted to account for numerous confounding variables including behavioural problems in childhood, child and family characteristics, and variables associated with schooling.

Overall, the results of Currie and Tekin (2012) indicate that even when accounting for confounding variables, experiencing any maltreatment increased the risk of offending for both males and females, though the effects were larger for males than females. Though many of the confounding variables made unique contributions to offending, including ADHD, race and age, none removed the unique contribution of maltreatment to offending outcomes. Specific maltreatment types appeared to have different impacts on offending. The largest negative impact was evident for sexually
abused individuals, who were at increased risk of all self-reported criminal outcomes except hard drug use and official criminal convictions. Comparatively, parental failure to meet basic needs was associated with an increased risk of assault and property damage, and physically abused individuals were at increased risk of non-drug offences, and damaging property. Comparisons of individuals who experienced two or more maltreatment types, to individuals with one maltreatment type or no maltreatment experiences, revealed that the risk of criminal behaviour increased when multiple maltreatment types were experienced.

The results of Currie and Tekin (2012) are consistent with the observed trends in the above reviewed studies, regarding the impact of sexual abuse on self-reported offending. Additionally, Currie and Tekin’s (2012) results indicate an impact of neglect on offending, which is consistent with the preceding studies. Lastly, Currie and Tekin’s (2012) results highlight a particular need to consider the impact of experiencing multiple maltreatment types compared to single maltreatment types.

Elklit, Karstoft, Armour, Feddern, and Christoffersen (2013) attempted to predict criminality based on typologies of child maltreatment alongside post-traumatic stress symptoms. Using self-report data obtained from structured interviews with a random probability sample of 2,980 Danish individuals born 1984, who were aged 24 years at the time of the interview. Individuals were considered to have experienced child maltreatment if they received intervention from Danish child protection authorities. Typologies of child maltreatment were based on responses to self-report items regarding the experience of physical abuse, emotional abuse, neglect and sexual abuse. The four final maltreatment typologies were classified as a non-maltreated group, a predominantly psychologically maltreated group, a predominately sexually abused group, and an overall abuse group accounting for combined physical abuse, neglect and emotional abuse. Criminal offending was reflected in dichotomous yes/no responses to seven self-report items regarding engaging in shoplifting, theft of a bicycle, theft of a car, burglary, vandalism, violence, and receipt of a conviction. A yes response to three or more of these seven items was classified as criminal behaviour. A screening tool was used to assess the presence of PTSD.

The results of Elklit et al. (2013) indicated that all abuse typologies were significantly associated with criminal behaviour, though odds ratios were smallest for
sexual abuse and largest for overall abuse. These results of Elklit et al. (2013) provide
the first indication in this thesis of the potential impact of emotional abuse on offending.
PTSD also uniquely contributed to an increase in criminal behaviour. Lastly, females
were less likely to engage in crime than males. Elklit et al. (2013) interpreted the results
to mean that cumulative harm, from experiencing multiple types of maltreatment, may
have resulted in the stronger link between overall maltreatment (combined physical
abuse, neglect and emotional abuse) and criminal behaviour. Similarly, the unique
contribution of PTSD to criminal behaviour provided further indication of the impact of
cumulative harm not limited to child maltreatment, on criminal behaviour.

Taken together, the results of the seven studies reviewed in this subsection
highlight an overall link between maltreatment and offending, particularly when all
maltreated children are grouped together regardless of maltreatment type. It is
particularly important though to consider whether grouping all maltreated children
together in analyses has exaggerated the apparent link between maltreatment and
offending, and prevented consideration of whether some maltreatment types share a link
with offending while others do not. It is also necessary to consider whether grouping all
maltreated children together resulted in the inclusion of children with multiple
maltreatment types with children with single maltreatment types, again resulting in an
exaggeration of maltreatment and offending links. For example, the results of Elklit et
al. (2013) and Currie and Tekin (2012) indicate that the experience of multiple
maltreatment types increased risk of offending more than the experience of some
maltreatment types in isolation. The impact of experiencing multiple maltreatment
types, compared to single maltreatment types, on youth offending is a particular concern
in Study 2 and Study 3 of this thesis.

Importantly, comparisons of the articles presented in this section indicate that
observed links between maltreatment types and offending may vary according to the
outcome measure of interest, such as self-reported offending versus official records.
Overall though, the results of the studies reviewed in this section indicate a relatively
consistent link between neglect and offending, and less consistently observed links
between physical abuse, sexual abuse and emotional abuse and offending. Clearly, more
research is required which examines the isolated impact of each maltreatment type on
various offending outcomes. The impact of each distinct maltreatment subtype on youth
offending is a particular point of focus in this thesis, in each of the three studies.
Integration of the results of the seven studies reviewed in this section also highlights the potential for non-maltreatment variables to impact on observed maltreatment and offending links. These results lend support to developmental systems theories (DST) and developmental and life-course criminology (DLC) in highlighting the need to consider the broader developmental system. Due to reliance on administrative data in the three studies of this thesis, the impact of the broader developmental system on offending outcomes cannot be directly examined. Nonetheless, the potential impact of the broader developmental system, and the limitations of drawing conclusions from administrative data are consistently acknowledged in interpretation of the results of the three studies of this thesis.

Lastly, as noted throughout this section, many of the reviewed studies accounted for childhood maltreatment only, and did not account for maltreatment occurring in adolescence, or maltreatment across all of childhood and adolescence. As indicated by both DST and DLC, in order to better understand the links between maltreatment and offending, it is important to consider the entire life-course temporally. Specifically, it is important to consider childhood maltreatment as well as adolescent maltreatment. In this thesis, the use of administrative data enables consideration of maltreatment across the life-course from birth to the age of 18 years. This also allows consideration of the impact of maltreatment timing on observed maltreatment and offending links. The impact of maltreatment timing is considered across each of the three studies of this thesis. The following section (section 3.5.2) reviews available research accounting for the impact of maltreatment timing on observed maltreatment and offending links.

3.5.2 The impact of maltreatment timing on maltreatment and offending links.

In this section, four studies examining the impact of maltreatment timing on maltreatment and offending links are reviewed. Again, consideration is provided to the operationalisation of key variables and the primary results of each study. This section is concluded with a discussion of consistencies and inconsistencies across the results of these studies, and the implication of these for this thesis.

Using a developmental psychopathology framework, Ireland, Smith, and Thornberry (2002) attempted to determine the impact that maltreatment timing had on
subsequent adolescent delinquency and drug use. Self-report data from the Rochester Youth Development Study (RYDS) in the USA was utilised in conjunction with official data from child protection services and the police. The sample included 1000 school children (starting from when they were aged approximately 14 years) and their caretakers. Delinquency was operationalised using official data (arrest or ‘official contact with police’ data) and self-reports pertaining to when these youths were aged approximately between 14 and 18 years old. From the age of approximately 14 to 15.9 years old, participants were classified as early adolescents. From the age of approximately 16 to 17.9 years old, participants were classified as late adolescents.

Ireland et al. (2002) operationalised maltreatment as any substantiated incident of maltreatment which was reported to child protective services. The researchers recorded whether any substantiated incidents of maltreatment occurred in the participants’ lives, and if so, at what developmental stage this occurred. Four categories of maltreatment were determined as follows: (1) Childhood-only maltreatment referred to cases in which at least one substantiated incident of maltreatment occurred in childhood (birth to age 11), but no further incidents occurred at any later developmental stage (10.7% of the total sample); (2) Adolescence-only maltreatment referred to cases in which at least one substantiated incident of maltreatment occurred in adolescence (age 12 to 17), but no other incidents of maltreatment occurred before this developmental stage (7.8% of the total sample); (3) Persistent maltreatment referred to cases in which at least one substantiated incident of maltreatment occurred in childhood, and another substantiated incident occurred in adolescence (2.8% of the total sample); and lastly (4) No substantiated maltreatment referred to cases in which no substantiated cases of maltreated were recorded at any time in childhood or adolescence (78.6% of the total sample).

Only behaviours that would equate to illegal offences were recorded as delinquency in this study (Ireland et al., 2002). There were four categories of delinquency: general delinquency, drug use, violence, and serious street crime. Early and late adolescent drug use was determined via self-reports. Chronic offending in any of these four categories, referred to individuals who offended at a high frequency. These researchers also controlled for socio-demographic status or economic disadvantage, race or ethnicity, parent education, community poverty, gender, and the presence of both biological parents in the home (Ireland et al., 2002).
The results of Ireland et al. (2002) were as follows: (1) When all maltreated children were considered together, the maltreated group were more likely to engage in all categories of delinquency than the non-maltreated group. Specifically, maltreated children had higher rates of chronic delinquency and occasional offending (non-chronic) in all categories of delinquency than non-maltreated children; (2) Childhood-only maltreatment did not share any significant relationship with officially recorded arrests in early or late adolescence; (3) Persistent maltreatment and adolescent-only maltreatment each shared a significant relationship with officially recorded arrests in early and late adolescence; (4) Childhood-only maltreatment did not share a significant relationship with any form of self-reported delinquency in early or late adolescence, excluding violent crime in early adolescence; (5) Adolescence-only maltreatment shared a significant relationship with all forms of delinquency in early adolescence, and self-reported street crime and general delinquency in late adolescence; (6) Persistent maltreatment shared a significant relationship with arrest and all forms of self-reported delinquency in late adolescence, and arrest, drug use and street crime in early adolescence, and lastly; (7) Persistent maltreatment was more likely to result in late adolescent drug use than adolescent maltreatment. This was the only significant difference between the adolescent maltreatment and persistent maltreatment groups in relation to developmental outcomes.

Ireland et al. (2002) argued that adolescent maltreatment and persistent maltreatment were more similar than different with regards to their effect on delinquency and drug use. Ireland et al. (2002) concluded that maltreatment that occurs during adolescence (including adolescent-only and persistent maltreatment), produced the greatest risk of delinquency and drug use in early and late adolescence when compared to childhood maltreatment. These authors did not, however, consider the impact of maltreatment type.

Thornberry et al. (2010) examined the impact of maltreatment timing, by comparing early adult outcomes of individuals who experienced childhood limited maltreatment (limited to the period between birth and age 11 years) with those who experienced adolescent maltreatment (maltreatment between age 12 and 17 years, combined with maltreatment continuing from childhood into adolescence). The authors used propensity score matching on data from the Rochester Youth Development Study pertaining to complete maltreatment histories from child protection records of 907
individuals. Data collection began 1988 when the participants were in seventh or eighth grade. The sample largely consisted of males (73%), who were African American (68%), and residing in areas with high arrest rates.

Thornberry et al. (2010) identified different early adult outcomes for childhood limited maltreatment than for adolescent maltreatment. Importantly, adolescent maltreatment appeared to increase risk of youth offending, while childhood limited maltreatment did not. The results indicated 11 significant relationships. Childhood limited maltreatment increased risk of drug use, problem drug use, suicidal thoughts, and depressive symptoms. Adolescent maltreatment increased risk of general offending (self-reported), violent crime (self-reported), official arrest or incarceration (official records), alcohol use, problem alcohol use, drug use, problem drug use, risky sex, STD diagnosis, suicidal thoughts and depressive symptoms.

A particularly interesting result of Thornberry et al. (2010) was that when a global measure of maltreatment was used (not considering maltreatment timing), only three of the 11 relationships remained significant. The results of Thornberry et al. (2010) indicate that maltreatment timing has an important impact on general maltreatment and offending links, however it is possible that due to their operationalisation of adolescent maltreatment as including maltreatment which extended across childhood as well as adolescence, some of the results pertaining to adolescent maltreatment may be partly attributable to maltreatment chronicity or duration, as opposed to maltreatment timing in isolation. Again, maltreatment type was not considered.

Mersky, Topitzes, and Reynolds (2012) examined the impact of childhood maltreatment and adolescent maltreatment on delinquency and crime, with a particular focus on the impact of maltreatment timing on maltreatment and offending links. These authors utilised data from the Chicago Longitudinal Study pertaining to prospective official maltreatment and offending records for 1,539 low-income individuals of minority groups. Subgroups of maltreated young people were established to represent childhood maltreatment (maltreatment occurring prior to age 12 years), adolescent maltreatment (maltreatment between ages 12 and 17 years), and persistent maltreatment (at least one incident of maltreatment in both childhood and adolescence).
After controlling for sex, race/ethnicity, low birth weight status, preschool and school attendance, high school completion by the mother, maternal marital status at child’s birth, mother’s age at first birth, number of children in the household, residing in a high-poverty neighbourhood and receipt of public assistance, Mersky et al. (2012) determined that any maltreatment prior to age 18 years increased risk on all measures of youth offending, as measured by self-reports and official records, accounting for violent offending, drug offending, and property offending. Specifically, both childhood maltreatment and adolescent maltreatment were associated with the majority of youth offending outcomes, though adolescent maltreatment did show larger standardised effects. Interestingly, when offending outcomes were extended to consider adult offending, the links between childhood maltreatment and adult offending were more robust than the links between adolescent maltreatment and offending.

Smith et al. (2005) further examined the impact of adolescent maltreatment on young adult antisocial behaviour, with additional consideration of maltreatment type. These authors utilised data from the Rochester Youth Development Study, including interview data from parents and participants (aged between approximately 13.5 years and 22 years of age), arrest data from police records, and maltreatment data from child protection services. Maltreatment was coded according to the age of the child when the maltreatment was reported (maltreatment occurring after 12 years of age was considered adolescent maltreatment), as well as by type, including physical abuse, sexual abuse, and emotional maltreatment/neglect. As the majority of participants experienced multiple types of maltreatment, they were categorised according to the following guidelines: If any sexual abuse was experienced, the participant was categorised as sexually abused. If any physical abuse occurred (in the absence of sexual abuse), the participant was categorised as physically abused. If the participant experienced physical neglect, or moral/legal/educational maltreatment, they were classified as neglected.

Smith et al. (2005) operationalised antisocial behaviour according to self-reports of general offending, violent offending, and drug use, occurring in late adolescence (ages 16-18) and early adulthood (ages 20-22), as well as official data pertaining to arrest during late adolescence and early adulthood. Control variables in this study included prior antisocial behaviour (antisocial behaviour occurring prior to either late adolescence or early adulthood), whether the parents of the participant finished high
school, family poverty, change in caregivers over the participant’s life-course, gender, race or ethnicity, and community poverty.

The results of Smith et al. (2005) were as follows: (1) After taking prior involvement in antisocial behaviour, and the other control variables into consideration, adolescent maltreatment as a global variable increased the risk of arrest, violent offending and drug use in adolescence, but did not increase the risk of general offending in adolescence; (2) Compared to non-maltreated adolescents, after considering the control variables including prior antisocial behaviour, maltreated adolescents (where maltreatment was considered as a global variable) were at greater risk of arrest, general offending, violent crime, and drug use in early adulthood. Arrest in early adulthood was where adolescent maltreatment had the greatest impact; (3) Adolescent neglect, compared to the absence of maltreatment, increased the risk of arrest, general offending, and violent crime in late adolescence, but did not increase the risk of drug use. Further, adolescent neglect increased the risk of arrest and drug use in early adulthood, but not general or violent offending; (4) Adolescent physical abuse, compared to the absence of maltreatment, increased the risk of violent crime and drug use in late adolescence, but did not increase risk of arrest or general offending. Further, adolescent physical abuse increased the risk of violent offending in early adulthood, but no other antisocial outcomes, and lastly; (5) Adolescent sexual abuse did not increase the risk of any antisocial outcomes in late adolescence compared to the absence of maltreatment. However, adolescent sexual abuse was related to general offending and drug use in early adulthood.

Smith et al. (2005) concluded that, even after considering a variety of control variables, adolescent maltreatment increased the risk of deviant behavioural adaptations in both late adolescence and early adulthood. In particular, while adolescent neglect increased the risk of negative outcomes for late adolescence and early adulthood, its greatest impact was on deviance in late adolescence. Additionally, adolescent physical abuse was linked to increased risk of violent offending in late adolescence and early adulthood. Lastly, sexual abuse was proposed to have had a “sleeper effect”, with regards to the fact that it did not affect adolescent deviance, but did act as a risk factor for deviant behaviour in adulthood. The results of Smith et al. (2005) indicate the clear importance of considering interactions between maltreatment type and timing. The focus of Study 3 in this thesis is identification of interactions between maltreatment
dimensions including type, timing and frequency, which affect maltreatment and offending links.

Taken together, the results of the studies reviewed in this section highlight the importance of considering the impact of maltreatment timing on observed maltreatment and offending links. Though maltreatment in early childhood may increase risk of offending, it appears that stronger links exist between adolescent maltreatment and offending. Importantly, as noted in the preceding section regarding the impact of maltreatment type, in this section observed maltreatment and offending links varied according to the outcome measure of interest. Across the three studies of this thesis, the outcome measure of interest is official records of youth offending. It is acknowledged that the results of this thesis may not be directly comparable to existing research which relies upon self-reported offending.

In addition to the above observations, the review of studies in this section has highlighted the added benefit of considering interactions between maltreatment type and timing, and the impact of these interactions on observed maltreatment and offending links. A challenge remaining for researchers is to perform research which allows simultaneous consideration of numerous maltreatment dimensions, whilst also allowing identification of the unique impact of each. Though the research reviewed above has allowed consideration of maltreatment type and timing the impact of maltreatment frequency, severity and chronicity have not yet been discussed. These maltreatment dimensions are the focus of the following section (Section 3.5.3).

3.5.3 The impact of maltreatment frequency, severity and chronicity on maltreatment and offending links.

In this section, three studies which consider the impact of maltreatment frequency, severity or chronicity on observed maltreatment and offending links are reviewed. Again, the focus remains on operationalisation of key variables, and consistencies and inconsistencies across the reported results.

Eckenrode et al. (2001) attempted to determine the link between maltreatment and early onset problem behaviours in affected youths, with a particular focus on the impact of an early nurse home visitation intervention program. They constructed four
maltreatment variables: subtype, comparing neglect and abuse (which combined physical abuse and sexual abuse cases), total number of substantiated reports of maltreatment for each participant (based on official data), developmental timing of the maltreatment (childhood limited, adolescent limited, and persistent), and chronicity (the period of time between the first substantiated report and the next). The dependent variables of interest were early-onset problem behaviours of the children, including health-related behaviours such as the use of cigarettes, alcohol, illegal substances, sexual intercourse, and arrests for criminal behaviour, which were all determined via self-reports.

Participants of this longitudinal study were mothers who were recruited during their first live-birth pregnancy, and their children. Mothers were recruited from a free antepartum clinic in Elmira, New York. All mothers included in the study had at least one recognised parental risk factor, including being under 19 years of age at registration, being unmarried, or having low socioeconomic status. For the initial stages of the study, Eckenrode et al. (2001) divided the 400 participants into four treatment groups. Mothers in Group One, received sensory and developmental screening for their children at 12 and 24 months of age, and where necessary, follow-up clinical evaluation and treatment. Mothers in Group Two were provided the same services as Group One, and additional free transportation for parental and well-child care visits until the child’s second birthday. Group Three mothers received the services provided to Group Two, in addition to nurse visitations during pregnancy. Lastly, Group Four mothers received all services provided to Group Three, as well as nurse home visitations until their child’s second birthday. Nurse home visitations included promotion of three aspects of maternal functioning, including health-related behaviours during pregnancy and early life of the child, parental care provided to children, and maternal life-course development including family planning, educational achievement and workforce participation. Nurses also linked mothers with health and human services, and fostered networking with other family members and friends of the mother.

At the 15-year follow-up stage of this study, Eckenrode et al. (2001) conducted interviews with the original participant mothers, their adolescent children, and, in cases where the child had been adopted in these 15 years, their custodial parents. The researchers also reviewed files from social services including child protection services regarding child maltreatment reports, schools, and criminal justice records. The results
of this study by Eckenrode et al. (2001) were as follows: (1) The number of substantiated episodes of maltreatment was positively correlated with the number of early onset problem behaviours in the comparison group (non-nurse visitation group). This relationship remained significant even after controlling for domestic violence incidents, mother’s educational level, mother’s marital status, socioeconomic status, race, age, and child’s gender; (2) When treatment program was included in the analyses, the results showed that maltreatment did not share a relationship with early onset behaviour problems in the nurse visitation treatment group. This suggests that the nurse visitation treatment program moderated the effects of maltreatment on early onset problem behaviours; (3) The nurse visitation program appeared to reduce the number of maltreatment reports and chronicity, and helped to reduce persistent maltreatment (maltreatment occurring both in early childhood and adolescence), both of which increased the risk of early onset problem behaviours. To conclude, Eckenrode et al. (2001) identified a significant relationship between maltreatment, particularly chronic and persistent maltreatment, and early onset problem behaviour. Importantly, the nurse visitation early intervention program appeared to reduce the negative impact of maltreatment on these early onset problem behaviours.

Hamilton, Falshaw, and Browne (2002) considered the impact of recurrent maltreatment on offending. Their sample included 60 male and 19 female residents of a secure centre for emotionally and behaviourally disturbed young people aged between 11 and 18 years of age in the period 1994 to 1996. Residents of this centre were considered a risk to themselves or others. Data for each research participant was obtained from admission files, and included, among other variables, maltreatment history and offence history. Additional information regarding maltreatment history for each participant was obtained from reports by case workers.

The sample was sorted according to their maltreatment history, where 20.8% experienced no maltreatment (no victimisation), 5.2% experienced a single maltreatment incident by a single perpetrator (single victimisation), 1.3% experienced single maltreatment incidents by multiple perpetrators (multiple victimisation), 11.7% experienced multiple maltreatment incidents by a single perpetrator (repeat victimisation), 6.5% experienced multiple maltreatment incidents by multiple perpetrators (revictimisation), and 54.5% experienced both repeat victimisation and revictimisation. Further, with regards to the experience of maltreatment types (sexual
abuse, physical abuse, neglect, and emotional abuse, as well as extra-familial physical abuse and extra-familial sexual abuse), within the total sample, 26.2% experienced one maltreatment type, 34.4% experienced two, 21.3% experienced three, 14.8% experienced four, and 3.2% experienced five or six maltreatment types.

The results of Hamilton et al. (2002) indicated that revictimisation increased the risk of committing violent and/or sexual offences more than intrafamilial repeat victimisation or no abuse in childhood. The greatest likelihood of committing violent and/or sexual crimes was noted for individuals who experienced extrafamilial repeat and/or revictimisation, or both repeat and revictimisation inside and outside the family. Individuals with no abuse history had similar offending patterns to individuals with intrafamilial repeat victimisation, though the authors did note that this may be due to the behaviourally and emotionally disturbed nature of the sample. In relation to this thesis, the results of Hamilton et al. (2002) indicate the importance of considering maltreatment type and frequency, and highlight the potential limitation of using data which only allows consideration of maltreatment by parents and caregivers, without consideration of victimisation occurring outside of the family context. These arguments complement the work of Finkelhor and colleagues (2007a, 2007b) regarding poly-victimisation.

Of direct relevance to this thesis, the results of Hamilton et al. (2002) highlight the need to consider not only the type of maltreatment experienced, but the frequency of experiencing each maltreatment type. Specifically, there is a need to determine the unique impact of experiencing multiple events of a single maltreatment type, single events of multiple maltreatment types, and multiple events of multiple maltreatment types. This is the focus of Study 3 of this thesis.

Verrecchia, Fetzer, Lemmon, and Austin (2011), examined the links between maltreatment and persistent youth offending, with consideration of the direct impact of developmental stage (age of onset of maltreatment ranging from birth to 17 years of age), supervisory neglect, recurrence (frequency of substantiated maltreatment events prior to offending ranging from zero to 18 reports) and severity (degree of sustained injury) on youth offending, alongside consideration of ecological risk factors represented by measures of community risk, family functioning, and academic and behaviour risk. Persistent youth offending was represented by the number of juvenile
court processed delinquency referrals, while maltreatment reflected substantiated reports. The sample represented low income males, born 1975, residing in urban areas of Pennsylvania.

The results of Verrecchia et al. (2011) indicated that supervisory neglect, maltreatment recurrence, and maltreatment severity increased risk of delinquency referrals, even after controlling for other variables. Supervisory neglect produced the largest effects. Behaviour and academic risk and family risk also appeared to have direct effects on offending, though maltreatment dimensions appeared to increase behaviour and academic risk, meaning there was potential for indirect effects as well as direct effects. Community risk and age of maltreatment onset did not appear to increase risk of offending. Of course, a limitation of the work of Verrecchia et al. (2011) was that examination of the impact of maltreatment type was restricted to examination of the impact of supervisory neglect on delinquency referrals, compared to a reference category which grouped all the remaining maltreatment types together (including physical abuse, sexual abuse, abandonment and educational neglect among others). There is a need for additional research which considers maltreatment frequency and severity alongside maltreatment timing and type. In this thesis the focus remains on simultaneous consideration of multiple maltreatment dimensions, including type, timing, and frequency, and their unique and shared impact on observed maltreatment and offending links.

The results of the three studies reviewed in this section indicate the importance of considering maltreatment frequency, severity and chronicity alongside maltreatment type and timing. In particular, the results of these studies highlight the potential for complex interactions between multiple maltreatment dimensions which may affect observed maltreatment and offending links. Operationalisation of these variables in this thesis is restricted by the use of administrative data from the Queensland child protection and youth justice systems. In this thesis, the impact of maltreatment type (neglect, sexual abuse, physical abuse and emotional abuse), timing, frequency, and chronicity on observed maltreatment and offending links is considered across the three studies using different analytical techniques in each. Details regarding the operationalisation of these variables in each Study are provided in Chapter Four.
3.5.4 The impact of gender and ethnicity on maltreatment and offending links.

The impact of gender and ethnicity has been indirectly discussed in several of the studies reviewed above. In this section, additional studies providing a direct examination of the impact of gender and ethnicity on maltreatment and offending links are reviewed.

Topitzes, Mersky, and Reynolds (2011) examined gender-specific effects and pathways from child maltreatment to juvenile offending. The focus was child maltreatment occurring between birth and age 11 years. The authors used official measures of child maltreatment and offending from the Chicago Longitudinal Study pertaining to 1,539 individuals (989 individuals who completed a kindergarten program in 1986, and 550 individuals who completed a preschool program in 1983 or 1984). All individuals were economically disadvantaged and minority group members. Youth offending was represented by any arrest resulting in a petition to the juvenile court, while adult offending was represented by any arrest resulting in a guilty verdict in adult court.

The results of Topitzes et al. (2011) indicated that child maltreatment significantly predicted delinquency by males, but not females. Nonetheless, gender did not moderate the overall link between maltreatment and offending when males and females were included together in analyses. When the outcome measure was extended to include adult offending, the results indicated that maltreated males and females were both more likely to offend than non-maltreated males and females. Topitzes et al. (2011) interpreted these results as a potential “lagged” effect of maltreatment on females.

Topitzes et al. (2011) also examined potential gendered pathways from child maltreatment to adult offending for males compared to females. They identified different pathways from maltreatment to adult offending for males and females. Adult offending by males appeared to be attributable to externalising behaviour and school commitment in childhood, and socio-emotional skills, delinquency, and educational attainment in adolescence. Comparatively, adult offending by females appeared to be attributable to parent factors in childhood, and externalising behaviour, cognitive performance, mobility and educational attainment in adolescence. Overall, the results of
Topitzes et al. (2011) highlight the importance of considering the differences between males and females in research regarding maltreatment and offending links.

Asscher, Van der Put, and Stams (2015) also directly investigated gender differences in maltreatment and adolescent offending links. The research sample included juveniles with at least one conviction, and relied on retrospective, self-reports of maltreatment histories accounting for physical abuse, sexual abuse and neglect, which were matched with administrative records and official data. Hence, any suspected or confirmed maltreatment was included, with exclusion only for cases proven to be false. Criminal history was based on official records of convictions, with sexual and violent offending being of particular interest. Other indicators of violence also used in the research included self-report data from affected young people, their families, school and other associated professionals.

Overall, Asscher et al. (2015) identified a general link between sexual abuse and sexual offending, with the link being stronger for males than females. These authors also noted a link between physical abuse and violent offending in females, while for males violent offending was associated with any abuse history. Importantly, these authors noted gender differences in the experience of each maltreatment type, as well as offending behaviours. For example, males engaged in sexually violent behaviour and felony against person offences more often than females, though the total number of violent behaviours did not differ across males and females. Alternatively, females engaged in misdemeanour against person offences more often than males. Potential interactions between maltreatment types were not addressed in this study.

Goodkind, Shook, Kim, Pohlig, and Herring (2013) examined the impact of race, gender and system experiences on pathways from child welfare to juvenile justice. Goodkind et al. (2013) used administrative data for individuals born between 1985 and 1994 from the Department of Human Services (DHS) in Western Pennsylvania. The data from DHS incorporated data from internal systems relating to child welfare, mental health, and substance abuse, and external systems relating to juvenile justice, the county jail and the Department of Public Welfare. The outcome variables of interest were juvenile justice involvement, as represented by time spent in a juvenile justice facility, mental health, as represented by receipt of mental health services prior to juvenile justice involvement, and substance abuse, as represented by receipt of substance abuse.
services prior to juvenile justice involvement. The authors considered the impact of maltreatment timing, by comparing cases in which the final child welfare case was closed prior to the age of 13 with those which remained open after the age of 13 years. They examined the impact of out of home placement and mental health services receipt. The impacts of race (African American compared to White) and gender were also considered.

The results of Goodkind et al. (2013) indicated that males are at increased risk of offending compared to females, and African American youths are at increased risk of offending compared to White youths. Interaction effects indicated that the increased risk of African American males compared to White males, was larger than the increased risk of African American females compared to White females. Individuals whose child welfare case remained open after 13 years of age were more likely to offend than those whose case was closed prior to age 13 years. Out of home placement and mental health service receipt also increased risk of offending. The impact of out of home placement was larger for females than males. Substance abuse appeared to increase risk of offending by White males but not African American males or either subgroup of females. Congregate care (residing in a group home or residential care facility) increased risk of offending, and the impact was larger for White youths than African American youths, and was largest for females.

The results of the studies reviewed in this section highlight the need to consider whether potentially complex interactions between maltreatment dimensions and youth offending, vary across males and females and across different racial groups. Overall the results of the studies indicate a higher risk of offending for males than females, though other variables, such as child protection interventions and family characteristics may alter these levels of risk. Similarly, the results indicate a greater risk of offending among minority groups when compared to White youths, though again, child protection interventions may affect these risks.

As argued earlier in this chapter, there is significant overrepresentation of Indigenous Australian youths in the child protection and youth justice systems in Australia. The potential impact of Indigenous status on maltreatment and offending links is particularly important to consider in this thesis. Based on the results of the studies reviewed in this section, the impact of sex and Indigenous status on observed
maltreatment and offending links receives constant attention across the three studies of this thesis. In particular, Study 3 provides direct examination of interactions between maltreatment dimensions and youth offending outcomes, for males compared to females and Indigenous youths compared to non-Indigenous youths.

### 3.5.5 Other variables affecting maltreatment and offending links.

Many of the studies reviewed in the above sections have noted the potential impact of non-maltreatment variables on observed maltreatment and offending links. In this section additional articles which provide a direct examination of the effects of non-maltreatment variables on maltreatment and offending links are reviewed.

Baskin and Sommers (2011) performed a prospective analysis of data from administrative child protection and youth offending records from Los Angeles County to determine the impact of maltreatment type, out of home placement type and placement instability on subsequent delinquency. The data represented young people aged from birth to 12 years who entered the child protection system either 1990 or 1993, and offending data spanning 1990 to 2005. These authors used a matched controls design comparing maltreated young people in group homes, foster families and family maintenance placements, and notified but unsubstantiated cases. Maltreatment type definitions were consistent with administrative records and accounted for physical abuse, sexual abuse, severe neglect, general neglect, emotional abuse, exploitation, and caretaker absence or instability. Comparisons of maltreatment types compared sexual abuse, neglect and physical abuse to a combined comparison group representing the “other” maltreatment types.

Overall, with regards to a general outcome variable of total arrests, Baskin and Sommers (2011) found that sexually abused youths were less likely to be arrested than youths in the ‘other maltreatment’ category. Additionally, being Black, older at initial placement, experiencing a larger number of placement changes, having a longer duration in out of home care, and residing in a group home, also increased risk of total arrests. When the outcome measure was arrests for violent offending, physically abused, sexually abused and neglected youths were less likely to be arrested than youths in the ‘other maltreatment’ category. Being male, older at initial placement, experiencing a larger number of placement changes, and having a longer duration in out of home care,
all increased risk of arrests for violent offending. When the outcome measure was arrests for non-violent offending, physically abused youths were more likely to be arrested than youths in the ‘other maltreatment’ category. Being older at initial placement, experiencing a larger number of placement changes, having a longer duration in out of home care, residing in a group home or a foster family also increased risk of non-violent arrests. Overall, placement instability and age at placement were the strongest predictors of arrests for violent and non-violent crimes by maltreated youths.

Brezina (1998) sought to determine intervening processes in the relationship between adolescent maltreatment and delinquency, particularly by testing the theories of social control, social learning, and social-psychological strain. This study relied upon national self-report survey data from the Youth in Transition survey (YIT) (Bachman, O’Malley, & Johnston, 1978 cited in Brezina, 1998) in the USA. The data pertained to a sample of 2,213 male youths who were entering the 10th grade in the fall of 1966, and 1,886 of these same male youths as they were completing the 11th grade in the spring of 1968.

The youths included in the study by Brezina (1998), were considered maltreated if they reported that their parents “often (1) slap them, (2) threaten to slap them, (3) yell, shout, or scream at them, and (4) give out undeserved blame and criticism” (p. 80). The operationalisation of delinquency in this study, included self-reports on two scales. The first scale was a theft/vandalism scale, accounting for arson, shoplifting, petty and serious theft, auto theft, trespassing, and purposeful destruction of school property. The second scale was an interpersonal aggression scale, accounting for self-reports of being involved in serious fights, gang fights, robbery, injuring others, or hitting their parents and teachers. Responses to the above scales were calculated, and a general delinquency measure was constructed based on the mean of these two scales. Other variables of interest in this study included social control factors (which accounted for measures of parental attachment and commitment to school), social-learning factors (accounting for beliefs which were favourable to delinquency and aggression), anger and negative affect factors, and socioeconomic status and race.

In the study by Brezina (1998), adolescent maltreatment was found to have a causal effect on later delinquency (controlling for delinquency occurring prior to the maltreatment). Adolescent maltreatment was also associated with reduced parental
attachment, reduced commitment to school, adherence to deviant beliefs (believes favourable to delinquency), and increased anger. Further, a number of these intervening processes were linked to later delinquency, namely commitment to school, anger, and deviant beliefs. Adolescent maltreatment did not significantly affect beliefs favourable to aggression. When these other indirect effects were considered, the direct link between adolescent maltreatment and delinquency reduced to insignificance. Brezina (1998) concluded that “adolescent maltreatment gives rise to delinquency because it tends to reduce social control, fosters deviant socialization, and generates anger” (p. 85). These results indicate the need to consider the processes underlying the links between maltreatment and offending, particularly when formulating policy recommendations and intervention and prevention efforts.

Using a prospective, longitudinal cohorts design, Kaufman and Widom (1999) attempted to unravel the interrelationships amongst childhood maltreatment, running away, and delinquency. In particular, these authors attempted to determine whether running away mediated or moderated the relationship between maltreatment and delinquency. Kaufman and Widom (1999) compared interview data pertaining to a group of matched controls (matched according to age, gender, race and approximate social class), with interview data for a sample of American adults who were physically abused, sexually abused or neglected as children (as identified through official court data).

Maltreatment was measured dichotomously (participants divided between maltreated or non-maltreated) for some analyses, and divided by subtypes for other analyses, namely physical abuse, sexual abuse and neglect. These authors used four measures for running away, which represented increasing severity of running away behaviour. These included: (1) Self-reported running away before the age of 18; (2) Self-reported overnight running away before the age of 15; (3) Self-reported multiple occasions (more than once) of running away before the age of 15; and (4) Police records of being charged with running away as a juvenile. Delinquency was operationalised as any official record of being arrested as a juvenile (excluding being arrested for running away from home). Control variables included in the analyses were age, gender, race or ethnicity, and family social class (as measured by whether the participant’s family had ever received welfare payments).
The results of this study by Kaufman and Widom (1999) indicated that maltreated children were more likely to run away than non-maltreated children, regardless of the definition of running away used. This finding held for maltreatment in general, and for all subtypes except for physical abuse (physically abused children were not more likely to run away compared to controls). Runaway youths were at increased risk of delinquency compared to non-runaways (regardless of the definition of runaway used). As the severity of the running away increased, so did the risk of delinquency. This relationship maintained significance even after including control variables in the analyses.

Kaufman and Widom (1999) found that maltreated children were at increased risk of delinquency compared to controls. This relationship maintained significance even after controlling for demographic factors, family factors, and running away. Running away did not mediate the effect of maltreatment on delinquency, but did partially moderate the relationship between maltreatment and delinquency. The effect of running away on delinquency was greater for non-maltreated children compared to maltreated children. When non-maltreated children ran away, their risk of offending increased to a greater extent, than when maltreated children ran away. Kaufman and Widom (1999) concluded that both childhood maltreatment and running away increased the risk of a young person engaging in delinquency. Further, maltreated children were at greater risk of running away than non-maltreated children (Kaufman & Widom, 1999).

Jonson-Reid and Barth (2000a, 2000b) examined the impact of child welfare services on the maltreatment and juvenile offending relationship. These researchers compared two groups of children in California. The first group of children had been reported to child protective services for alleged maltreatment and received no further welfare interventions following an investigation. The second group of children had been reported to child protective services for alleged maltreatment and had subsequently received further intervention from child welfare services either in the form of in-home services or out-of-home placement. Jonson-Reid and Barth (2000a, 2000b) used official prospective data. The maltreatment subtypes of interest were sexual abuse, physical abuse and neglect. The dependent variable of interest was incarceration as a juvenile for a juvenile offence, as identified within official data.
The results of Jonson-Reid and Barth (2000a, 2000b) suggest that neglected children were more likely to be incarcerated as juvenile offenders compared to other maltreated children. Being male was a strong contributor to later incarceration. Multi-type maltreatment was linked to greater risk of incarceration. Additionally, being aged 14 years or older at the first maltreatment report was a strong contributor to incarceration. Females who had received additional services were more likely to be incarcerated than females who had not received additional services. The receipt of additional welfare services following investigation reduced the risk of incarceration for African American children and Hispanic children, but not for Caucasian children. Jonson-Reid and Barth (2000a, 2000b) concluded that greater attention should be given to maltreated females (particularly those who receive group care or foster care placements), neglected children, and children who have received no welfare services following a child protection investigation.

Taken together, the results of the studies reviewed in this section indicate that observed links between maltreatment dimensions and youth offending may in some cases represent complex underlying processes involving other non-maltreatment related variables. As noted throughout this chapter, the reliance on administrative data in this thesis precludes direct examination of variables associated with the broader developmental system, and their impact on observed maltreatment and offending links. Nonetheless, during interpretation of the results of this thesis, acknowledgment is provided to points of restricted generalisation of results. Specifically, it is acknowledged that the results of this thesis pertain directly to administrative records of substantiated maltreatment and offending, which may under-represent actual maltreatment and offending rates. Further, in this thesis, observed links between maltreatment and offending may at times reflect broader and more complex processes underlying the links which cannot be measured directly.

3.5.6 Summary.

There are some observable trends across the research findings presented throughout this critical review of literature on the links between maltreatment dimensions and youth offending. For example, links between neglect and offending appear to be more consistently observed than links between other maltreatment types.
and offending. Importantly though, observed links between particular maltreatment types and offending, appear to be affected by the selection of outcome variables. Additionally, links between adolescent maltreatment and youth offending appear to be more consistently observed in the literature than links between childhood maltreatment and youth offending. However, the results of this critical review also highlight these trends are typically identified in research which provides an incomplete examination of maltreatment, such as by only considering one type of maltreatment, or one dimension of maltreatment, or only part of the overall life-course of maltreated children.

Furthermore, an important observation across the critical review was that external variables, such as individual or family characteristics, child protection interventions and school achievement may affect observed links between maltreatment and offending links.

It is feasible to assume that observed trends across the literature regarding the links between distinct maltreatment types or dimensions require revisiting with a greater focus on the complex and heterogeneous nature of maltreatment over the entire relevant life-course (birth to 18 years) using newer, more advanced methods of analysis. A similar sentiment was expressed by Trickett et al. (2011) who argued that:

We know that for many victims, maybe most, child maltreatment is associated with maladaptive development in adolescence, but we still know little about how different forms of maltreatment, in different combinations, at different developmental stages, put in motion these developmental problems (p. 14).

Likewise, based on their review of the literature regarding the links between maltreatment and youth violence, Maas et al. (2008) identified the need for additional research examining maltreatment and youth offending links, with a particular call for longitudinal research, and greater consideration of gender, race and ethnicity, and the broader developmental system, as well as specificity in research definitions. As noted throughout this thesis, there is a need for a larger body of research using Australian data in order to determine the generalisability of available literature to the Australian child protection and youth justice context. It is particularly important to determine the relevance of international research to examinations of maltreated Indigenous Australian youths compared to maltreated non-Indigenous Australian youth. In the following
section, research using child protection and youth justice administrative data from Queensland is discussed.

3.6 Queensland Based Research on the Links Between Child Maltreatment and Youth Offending

As noted throughout this chapter, legislation and related definitions of maltreatment vary across jurisdictions within Australia and internationally, which can at times limit generalisability of results. As noted in the studies reviewed in the preceding sections, much of the research regarding maltreatment and youth offending links was performed in the USA. There is a need for research using Australian data to determine the generalisability of existing research to the Australian context of child protection and youth justice. There is a particular need for Australian research to examine the experiences of Indigenous Australian youths compared to non-Indigenous Australian youths.

The work of Stewart and colleagues (Stewart et al., 2005; Stewart et al., 2002; Stewart et al., 2008) is crucial to the three studies of this thesis. Operating within the broader project titled the Queensland Linkage Project (QLP) (see Stewart et al., 2015) these researchers have produced a range of studies using linked, prospective, longitudinal administrative data from Queensland government departments. Three of the studies have examined the links between child maltreatment and youth offending using linked administrative child protection and youth justice data from Queensland, Australia. These three studies, briefly described next, form the basis of Study 1 and Study 2 of this thesis. As the datasets, and operationalisation of key variables in these studies are directly relevant to the three studies of this thesis, this current section provides only a basic overview of the studies, while specific details are presented in Chapter Four of this thesis.

Using linked administrative data from the Queensland child protection and youth justice systems pertaining to young people born 1983, Stewart et al. (2002) examined the impact of maltreatment experiences on youth offending. The data were population data, representing all individuals born 1983 who had contact with the Queensland child protection system and/or the Queensland youth justice system requiring an appearance in court before the age of 18 years. This dataset is referred to as
Stewart et al. (2002) subjected the QLD83 dataset to binary logistic regression to explore the impact of neglect, physical abuse, sexual abuse, emotional abuse, sex, Indigenous status, number of notifications, number of substantiations, out of home placement, age at first substantiation, and age at last substantiation on offending outcomes. They found that youth offending, as represented by receipt of an order in youth court, was best predicted by being male, being Indigenous Australian, experiencing neglect, experiencing physical abuse, experiencing an out of home placement (used as a measure of maltreatment severity), having a higher number of notifications, and being older at the final substantiated maltreatment event.

Stewart et al. (2005) extended the work of Stewart et al. (2002), by extending the dataset for children born 1983 by incorporating equivalent data for young people born 1984, as well as data from the Queensland Police Service representing official police cautions. The resulting dataset is referred to as the QLD83/84 dataset in this thesis. Police cautioning was the primary method of diversion of young offenders in Queensland during this period, and diversion of young offenders was the primary policy of the youth justice system. Stewart et al. (2005) performed binary logistic regression using the same predictor variables as Stewart et al. (2002). Consistent with Stewart et al. (2002), Stewart et al. (2005) determined that youth offending, as represented by either the receipt of a formal police caution or an order in youth court, was best predicted by being male, Indigenous Australian, experiencing neglect, experiencing physical abuse, having a higher number of notifications and being older at the final substantiated maltreatment event. Inconsistent with the results of Stewart et al. (2002), Stewart et al. (2005) found no significant impact of out of home placement, but did find that a higher number of substantiated events increased risk of offending.

The method of Stewart et al. (2002, 2005) has a number of benefits. First, the use of linked administrative data allows examination of the entire maltreatment life-course from birth though to the end of adolescence, and youth offending from the age of 10 years (minimum age of criminal responsibility in Queensland) to 17 years of age (age at exit from youth justice system and entry to adult justice system in Queensland). Hence, this method allows temporal consideration of the impact of maltreatment experiences on youth offending. Additionally, the analyses allow simultaneous examination of maltreatment type, timing, frequency, severity, as well as the impact of
gender and Indigenous status. Based on the methodological strengths of their approach, the method of Study 1 of this thesis was drawn from Stewart et al. (2002, 2005).

Stewart et al. (2008) subjected the QLD83/84 cohort dataset to a semi-parametric group-based trajectory analysis to further examine the impact of maltreatment timing and frequency over the life-course on observed maltreatment and offending links. These authors identified six distinct maltreatment trajectory groups distinguishable by the timing and frequency of the maltreatment experienced over the life-course. Post-hoc analyses on these six maltreatment trajectory groups showed different rates of offending by the young people in each group. Stewart et al. (2008) concluded that maltreatment which began or continued in adolescence produced a higher rate of offending than maltreatment restricted to early childhood. These results are consistent with the earlier described results of Ireland et al. (2002) and Thornberry et al. (2010).

Interestingly, Stewart et al. (2008) also found that maltreatment commonly peaked at important transition points such as the transition from pre-school to primary school, and primary school to secondary school. These results are interestingly similar to those of Finkelhor et al. (2009). Using questionnaire data from the Developmental Victimization Survey pertaining to a nationally representative sample of children aged 2-17 years, Finkelhor et al. (2009) investigated potential pathways to becoming a “poly-victim” and identified that the onset of poly-victimisation was disproportionately likely to coincide with transitions into early elementary school (in the year prior to the children’s 7th birthday) and the transition to high-school (in the year prior to the children’s 15th birthday).

Though the type of transition noted by Stewart et al. (2008) and Finkelhor et al. (2009) remained roughly the same across the studies, they occurred at different ages (i.e. approximately five years old versus six-seven years old, and around 12 years old versus 14-15 years old, respectively). These results may suggest that the timing of maltreatment in relation to transition points may be more important that the timing of maltreatment in relation to age. Further research is certainly required to assist with meaningful interpretation of these results. To enable examination of transition points, the method of Study 2 of this thesis was drawn from Stewart et al. (2008).
3.7 Conclusion and Links to Chapter Four

Taken together, the information presented in this chapter highlighted the heterogeneous and complex nature of child maltreatment, and the need to simultaneously consider the unique and shared impact of numerous maltreatment dimensions on youth offending. In addition, the potential importance of jurisdiction and historical context to child maltreatment research was highlighted.

An overarching goal of this thesis is to extend Australian child maltreatment research, by utilising data which is directly relevant to Australian youths and child protection systems. In particular, an important focus of this research is the impact of Indigenous status on observed maltreatment and offending links. Lastly, the considerable development of child maltreatment research over time has been highlighted in this chapter. The information presented in this chapter has highlighted the need to consider whether existing research has continued relevance today.

As noted throughout this chapter, the two research questions under examination in this thesis are Research Question 1: Which maltreatment dimensions are related to youth offending? and Research Question 2: Do the links between maltreatment dimensions and youth offending change across cohorts? These research questions were selected to address important gaps in current knowledge regarding the links between maltreatment and offending.

There are three separate, yet interrelated studies in this thesis which, together, provide a comprehensive response to the two primary research questions. This thesis represents an application of mixed analytical methods. In the next chapter, Chapter Four, the research questions presented in this chapter are revisited alongside descriptions of the three studies designed to address the research questions, and the datasets in use in this thesis. Focus is also provided to the child protection and youth justice systems of Queensland, Australia, and the historical context surrounding them.
Chapter Four: Thesis Methodology and Analytic Strategy

4.1 Chapter Overview

This chapter includes a description of the datasets, methodology and analytic strategies used within this thesis to address the two primary research questions:

Research Question 1: Which maltreatment dimensions are related to youth offending?

and

Research Question 2: Do the links between maltreatment dimensions and youth offending change across cohorts? First, the two research questions are revisited alongside a basic introduction to the three studies designed to address them. Second, the three administrative datasets in use in this thesis are described and basic descriptive data are presented for each. Third, the historical context surrounding the datasets is illustrated with graphed cross-sectional Queensland administrative data from 1982 to 2008 and discussed with reference to key changes and influences on the Queensland child protection system during that period. This chapter is concluded with a brief explanation of terminology used across the three studies of this thesis, and associated restrictions on interpretation of the results.

4.2 Research Questions and Analytic Strategy

As specified previously, the two primary research questions in this thesis are

Research Question 1: Which maltreatment dimensions are related to youth offending?

and

Research Question 2: Do the links between maltreatment dimensions and youth offending change across cohorts? There are three studies in this thesis which together address these two research questions.

As described in the previous chapters, variations across jurisdictions and historical context are important to child maltreatment research. The starting point for the design of the three studies in this thesis was to build upon previously published research from Queensland, Australia, which used administrative data to examine the links between maltreatment experiences and youth offending. Using Queensland data removes the need to consider jurisdictional variability during comparison of results.
As described in Chapter Three, the work of Stewart et al. (2002), Stewart et al. (2005), and Stewart et al. (2008) was crucial to the design of this thesis. The aforementioned authors produced several research projects using linked, prospective, administrative data from the Queensland child protection and youth justice systems. Their administrative data represented contacts with the child protection system across the life-course from birth to age 17 years, and contact with the youth justice system from age 10 to 17 years. Stewart et al. (2002) used administrative data relating to children born 1983, referred to in this thesis as the QLD83 dataset. Stewart et al. (2005, 2008) used combined data for children born 1983 and children born 1984. In this thesis, this combined dataset from Stewart et al. (2005, 2008) is called the QLD83/84 dataset.

An important focus of Stewart and colleagues (2002, 2005, 2008) was life-course maltreatment experiences and subsequent youth offending. Attention was provided to maltreatment type, timing and frequency. Due to their capacity to account for maltreatment dimensions temporally across the life-course, the methodologies of these authors were applied in Study 1 (described in Chapter Five) and Study 2 (described in Chapter Six) of this thesis to provide a partial response to Research Question 1. To address Research Question 2, a newer extraction of equivalent administrative data was obtained for this thesis. The newer extraction represents children born 1990, and is called the QLD90 dataset. By subjecting this newer dataset to the same analytic methods of Stewart et al. (2002, 2005, 2008), and comparing the results from the QLD90, QLD83 and QLD83/84 datasets, this thesis provides a jurisdictionally consistent examination of the impact of historical context on observed maltreatment and offending links.

In Study 1 (Chapter Five), the three datasets are subjected to binary logistic regression, to determine whether youth offending by maltreated young people can be predicted by characteristics of their maltreatment experiences. Consideration is provided to the type, timing, and frequency of maltreatment, as well as gender and Indigenous Status. As described above, this method was drawn from Stewart et al. (2002) and Stewart et al. (2005).

In Study 2 (Chapter Six), the QLD83/84 and QLD90 datasets are subjected to semi-parametric group-based trajectory analysis to determine the number of distinct maltreatment trajectory groups distinguishable by maltreatment timing and frequency,
This method allows consideration of maltreatment timing, type, frequency, multi-type maltreatment, and gender and Indigenous status. As described above, this method was drawn from Stewart et al. (2008).

Finally, Study 3 (Chapter Seven) represents an exploratory application of a relatively new method of analysis termed the conjunctive analysis of case configurations (Miethe et al., 2008), to the QLD90 dataset. This method has not yet been applied in child maltreatment research, but allows examination of unique and shared variance of maltreatment type, timing, chronicity, frequency, gender, and Indigenous status on youth offending.

The three studies in this thesis are separate yet interrelated, and were designed to work together to provide a comprehensive response to the research questions. Any one of these studies viewed in isolation cannot effectively address the research questions, but together these three studies represent a comprehensive examination of the links between maltreatment experiences and offending amongst affected Australian children, with additional consideration of the impact of Indigenous status and historical context on these observed links. Analysis of the QLD90 dataset via mixed analytic methods provides a comprehensive response to Research Question One, while Research Question Two is addressed by comparing the results obtained using the QLD90 dataset with previously published results from equivalent analyses of the QLD83 and QLD83/84 datasets, whenever possible. An overview of the three QLD cohort datasets, and the variables included within them, is presented next, alongside basic descriptive data for each.

4.3 The QLD Cohort Datasets

Government departments routinely collect data regarding their functioning and service provision. These data are collectively referred to as administrative data. Each state and territory in Australia has a separate and unique child protection system shaped by a principal legislative Act and policy framework (Bromfield & Holzer, 2008). At the time of writing, the current government department with primary responsibility for child protection administration in Queensland is the Department of Communities, Child Safety and Disability Services. Though the Queensland government departments
responsible for child protection and youth justice in Queensland have been renamed and restructured numerous times, a consistent administrative dataset has been retained with each departmental change.

It is important to note here that all results reported in this thesis regarding the QLD83 and QLD83/84 datasets relate to analyses which were not performed by this author. Information relating to these datasets, and results from any analyses using these datasets, were sourced and directly reproduced from previously published material by aforementioned Stewart and colleagues. At all points of reproduction, the original authors and the publication source have been cited. Contrarily, all analyses and results pertaining to the QLD90 dataset, unless specifically stated, were performed by the author of this thesis.

The purpose of this section is to provide a basic overview of the three datasets utilised in this thesis. Sufficient detail is included to provide the reader with a basic understanding of the general nature of each dataset. The details included in this chapter are restricted to those that are directly relevant to interpretation of the three studies of this thesis. Where additional information is available outside of this thesis, a reference to the original source is provided.

### 4.3.1 QLD83.

Stewart et al. (2002) conducted all works associated with the QLD83 dataset. Only those details relevant to the three studies of this thesis are included here. All information included in this section was obtained from the published report of these authors. Additional details regarding the establishment of this dataset, cleaning and linkage of the data, as well as other research results pertaining to this dataset are also available in Stewart et al. (2002).

#### 4.3.1.1 General description of the dataset.

The QLD83 dataset was obtained by Stewart et al. (2002) in the year 2000, from the then Department of Families, Queensland. At the time of data extraction, the Department of Families was responsible for administration of child protection in Queensland, as well as children’s appearances in Queensland courts (Stewart et al.,
The QLD83 dataset includes all individuals born in the year 1983 who had contact with the Queensland child protection system and/or Queensland courts for a juvenile offence (Stewart et al., 2002). These data span from birth in the year 1983, to the age of 17 years in the year 2000. After the age of 17 years, individuals were no longer under the jurisdiction of the Department of Families (Stewart et al., 2002).

As required by legislative acts in operation over the period 1983 to 2000, the Department of Families recorded details for each young person who was the subject of a notification of suspected harm. These details included the young person’s name, date of birth, gender, country of birth, ethnicity, the age of the child at the time of notification, the statistical local area in which the child lived, and the notified harm category. Upon receipt of a notification, the Department was required to determine whether the child was in need of protection. When a notified child was determined to be in need of protection, their notification was substantiated, and the most serious harm type (regardless of whether multiple maltreatment types were present) was recorded as neglect, physical abuse, sexual abuse or emotional abuse. Information regarding assessment outcomes and protective actions was also recorded for each child where relevant. Children who received at least one substantiated notification are considered “maltreated”, while children whose notifications were not substantiated are considered “not maltreated”.

The Department of Families at this time was also required to record details of children who had contact for a juvenile offending matter. Specifically, these data included details of court appearances by affected children which required a response by the Department. For each contact regarding a court appearance, the Department was required to record the child’s date of birth, sex, Indigenous status, ethnicity or cultural background, spoken language, birthplace, suburb, postcode and statistical local area of residence, and parent/s’ date of birth. The Department was also required to record data for each court appearance involving the child, including matters dealt with at each appearance, matters finalised, most serious offence type finalised, and the most serious outcome. Final outcomes included no case to be heard, not guilty, order made, divert from formal order, non-supervised order, community supervision, immediate release, or detention served. Youths were considered to have “offended”, when the final outcome was an order, meaning they received a conviction. Youths were considered to be “non-offenders” when the outcome was a finding of not guilty, or no case to be heard.
Each distinct child was assigned a unique numeric identifier code at their first contact with the Department for either a child protection or juvenile offending matter. They retained this same code for each subsequent contact with the Department for any child protection or juvenile offending matter. Hence, using these unique numeric identifier codes, each distinct individual’s child protection and juvenile offending history could be de-identified for release to researchers, and linked to produce a prospective, life-course profile of maltreatment and juvenile offending experiences.

4.3.1.2 Basic descriptive data.

4.3.1.2.1 Child protection.

The QLD83 dataset includes child protection data for 4656 distinct children who were born in the year 1983, and who had contact with the Queensland child protection system before the age of 18 years. Together, the 4656 distinct children were the subject of 9811 notifications of maltreatment. The maximum number of notifications received by an individual was 23 ($M = 2.1, SD = 2.6$).

The 4656 distinct children who had contact with the Department for a child protection matter represented approximately 10% of the overall Queensland population of children born 1983 (Stewart et al., 2002). Of these 4656 distinct children, 53% were female, and 14% were Indigenous Australian children. Indigenous Australian children were clearly overrepresented in the child protection system. Census data indicated that Indigenous Australian children made up only 2.6% of the overall Queensland population of youths (Stewart et al., 2002). Likewise, females, who made up 49% of the overall population, were slightly overrepresented in the child protection dataset.

Out of the 4656 distinct children in the child protection dataset, 2885 distinct children received at least one substantiation, together accounting for 5053 substantiations. Females experienced 55% of the substantiated events, and Indigenous Australian children experienced 17% of the substantiated events. Across substantiated events, neglect was the most serious harm type identified in 37% cases, physical abuse in 30% of cases, emotional abuse in 18% cases, and sexual abuse in 15% of cases. The mean age at first substantiation was 7.56 years ($SD = 4.45$) and at final substantiation
was 8.95 ($SD = 4.42$). Importantly, Stewart et al. (2002) indicated that this was more a reflection of the functioning of the system than actual maltreatment experiences.

The maximum number of substantiations received by a single individual was 17 ($M = 1.8$, $SD = 1.5$). Importantly, of the 2885 distinct children with at least one substantiation, 1895 (65.7%) children had only one substantiation, 380 (13.2%) children had multiple substantiations for a single maltreatment type, and 610 (21.1%) had substantiations for multiple maltreatment types. Males and females were equally distributed across these three groups ($x^2 (2, N=2885) = 1.92, p<.38$). Non-Indigenous Australian children were more likely to have only one substantiation than Indigenous Australia children (67% versus 56%), while Indigenous Australian children were more likely to have substantiations for multiple maltreatment types than non-Indigenous children (29% versus 20%) ($x^2 (2, N=2,725) = 24.31, p<.001$).

### 4.3.1.2.2 Youth justice.

Consistent with Queensland legislation, the youth justice data within the QLD83 dataset related to any court appearance in Queensland between the ages of 10 (minimum age of criminal responsibility in Queensland) and 16 years, by any child born 1983. According to the relevant Queensland legislation affecting children born 1983, at the age of 17 years, a young person was no longer under the jurisdiction of the juvenile justice system, but was dealt with as an adult offender. The QLD83 dataset includes data for 2687 distinct children, who accounted for 7494 finalised court appearances. Indigenous Australian children accounted for 38% of these finalised court appearances, and males accounted for 82%. Analyses of this data by Stewart et al. (2002), included only cases where an order was made. Hence, analyses relate to 2593 distinct individuals, who accounted for 6993 appearances in which an order was made. These children represent approximately 5% of the overall birth cohort. Twenty-two percent of this group were Indigenous Australian children, and 79% were male.

Overall, 14% of children with any child protection record had a finalised offending record. Importantly, children with a substantiated maltreatment event were significantly more likely to have a finalised juvenile offending matter (17%) than children with only un-substantiated notifications (10%) ($x^2 (1, N=4,626) = 42.53, p<.001$). Characteristic of research from this time period, the relationship between the
experience of a single maltreatment type and offending, compared to the experience of multiple maltreatment types and offending, was not directly examined.

4.3.2 QLD83/84.
Stewart et al. (2005) conducted all works associated with the establishment of the QLD83/84 dataset. Only those details relevant to the three studies of this thesis are included here. All information reported here was sourced from Stewart et al. (2005). Additional details regarding the establishment of this dataset, cleaning and linkage, as well as other research results pertaining to this dataset, are available in Stewart et al. (2005).

4.3.2.1 General description of the dataset.
The dataset referred to in this thesis as the QLD83/84 dataset was based on data obtained by Stewart et al. (2005), from the then Department of Families, Queensland, and the Queensland Police Service (QPS). As described by Stewart et al. (2005), the QLD83/84 dataset accounted for all contacts with the then Department of Families, Queensland for a child protection matter, and/or an appearance in court as a youth, and all contacts with the QPS resulting in a formal police caution, for young people born 1983 and 1984.

The QLD83/84 dataset is consistent with the QLD83 dataset with regards to the nature of the child protection and court appearance data. However, the QLD83/84 dataset expanded on the QLD83 dataset by including equivalent data for children born in the year 1984, and by also including formal police cautioning data from the QPS. The QPS data were incorporated due to acknowledgment that the majority of youth offenders in Queensland were dealt with via formal police caution, which was the primary method of diversion at the time. The Juvenile Justice Act 1992 (Since renamed the Youth Justice Act, 1992) specified that in the first instance of offending, youthful offenders should be diverted from the justice system, primarily through use of formal police cautioning. It was accepted that the isolated use of court appearance data as a measure of offending, may result in an incomplete view of youth offending.
As the QPS dataset did not include a unique numeric identifier for each unique child, the linkage process for the QLD83/84 dataset was more challenging than for the QLD83 dataset. Data from the QPS contained information about the administration of formal police cautions, including the name, nickname and aliases of the affected young person, their sex, date of birth, as well as the location at which the caution was administered, details of the person administering the caution, and the reason for the caution, including the offence(s) committed. The QPS data was collected and stored by the offence. Hence, the first step in the linkage required matching of each offence to the relevant individual, to determine the total number of cautions received by each. Distinct children were initially identified electronically using an EXCEL macro, and then manually, based on name, date of birth and sex. Each distinct child was then assigned an identification number.

The Department of Families provided to the QPS, a dataset including the name, date of birth, sex and unique numeric identifier for each distinct child in their database. The QPS list of distinct individuals was then linked to the Department of Families’ list of distinct individuals. When a child appeared in both datasets, their QPS code was replaced with the Department of Families’ code. Following linkage, all identifying details were deleted or destroyed. The remaining de-identified matched list was then released to the researchers. The final stage of data linkage was consistent with the process used for the QLD83 dataset, using the unique numeric identifier codes.

4.3.2.2 Basic descriptive data.

4.3.2.2.1 Child protection.

There were 9541 distinct individuals born 1983 or 1984 who received at least one notification before the age of 18 years for a child protection matter, representing approximately 10% of the overall Queensland population born in these years. The maximum number of notifications received by an individual was 33 \((M = 2.11, SD = 2.08)\). Of all children notified 5,849 (61%) had at least one substantiated maltreatment event, and together accounted for 10,190 substantiations. The maximum number of substantiations received by an individual was 18 \((M = 1.07, SD = 1.45)\). The average age at first substantiation was 7.36 years \((SD = 4.60)\), and at last was 8.75 \((SD = 4.58)\).
Of the 5,849 children who are classified as “maltreated”, 53% were female, and 13% were Indigenous. This is a significant overrepresentation of Indigenous Australian young people, who made up approximately 5.8% of the overall Queensland population in this age group (ABS, 2001, cited in Stewart et al., 2008). Figures presented by Stewart et al. (2005) indicate that 5% of all non-Indigenous children living in Queensland were maltreated, compared to 17% of Indigenous Australian young people living in Queensland.

Amongst the 5,849 maltreated children and young people, 3,861 (66%) had only one substantiated event. Amongst these, neglect was the recorded harm type in 29.9% of cases, sexual abuse in 21.3% of cases, emotional abuse in 16.8% of cases and physical abuse in 39.1% of cases. As this topic was not crucial to the original project, the numbers and percentages of children experiencing multiple episodes of a single maltreatment type versus multiple maltreatment types were not directly reported by Stewart et al. (2005). Due to the overlap between the QLD83 and QLD83/84 datasets, the figures pertaining to multiple experiences of a single maltreatment type, versus the experience of multiple maltreatment types in the QLD83/84 dataset were likely to be similar to those reported for the QLD83 dataset.

4.3.2.2.2 Youth justice.

Of the 24,255 distinct children in the linked QLD83/84 dataset, 14,730 received at least one police caution, together accounting for 19,299 cautions. These 14,730 young people make up approximately 15% of young people in Queensland. Around 68% of these young people were male, and 32% were female, equating to approximately one in five young males in Queensland and one in ten young females in Queensland receiving a police caution.

There were 5235 (21.6%) distinct individuals in the dataset who had at least one finalised court appearance, together accounting for 14,059 finalised court appearances. This figure equates to approximately 8% of young boys in Queensland and 2% of young girls in Queensland having a finalised court appearance prior to age 17 years. Indigenous males were particularly over represented in this group. The reported figures indicate that approximately 40% of young Indigenous males in Queensland had a finalised court appearance.
In 12,945 finalised appearances, the child was found guilty, meaning there were 4,995 distinct individuals in the dataset who had been found guilty in at least one finalised appearance. A finalised court appearance with a guilty finding was more likely amongst boys than girls and amongst Indigenous young people than non-Indigenous young people. Overall, approximately 17% of the Queensland population of young people had experienced either a formal police caution and/or a finalised court appearance, and 70% of these were male.

In total, there were 24,255 distinct children included in the final QLD83/84 linked dataset. According to Stewart et al. (2005), these distinct children represented approximately 24% of the general Queensland population born in the year 1983 or 1984. Amongst those children and young people with at least one substantiated maltreatment event, 26% had either a formal police caution or finalised court appearance with a guilty outcome, compared to 17.5% of children with no substantiated maltreatment event. Again, characteristic of research produced in this time period, no indication was provided regarding the rate of offending amongst children with multiple maltreatment experiences compared to single maltreatment episodes.

4.3.3 QLD90.

4.3.3.2 General description of the dataset.

The dataset referred to in this thesis as the QLD90 dataset, included data for children born 1990 who had contact with the Queensland child protection system and/or the youth justice system. The child protection data were obtained by this author from the then Queensland Department of Child Safety in 2008. The youth justice data originated with the Department of Communities, but had been previously obtained and cleaned by other researchers at Griffith University. The release and linkage of these data occurred 2009 under ethics approval code CCJ/13/06/HREC. Importantly, QPS data were not obtained for the QLD90 cohort, meaning that in analyses of this dataset, juvenile offending is represented by finalised court appearances only, consistent with the QLD83 dataset. The final dataset was produced by data linkage using IBM SPSS Statistics Package Version 22, and the unique numeric identifiers for distinct children.
Consistent with the QLD83 and QLD83/84 datasets, the child protection variables obtained for the QLD90 dataset for each contact included unique numeric identifier for each child, date of birth, gender, ethnicity/Indigenous status, birthplace, assessing office, notification category, harm notified, notification outcome, whether the notification was substantiated or unsubstantiated (assessment outcome), assessed harm type, notifier source, and family type.

There were many changes over time which created difficulties for data extraction for the QLD90 dataset which were not experienced for the QLD83 and QLD83/84 cohort data pull. The Queensland Department of Child Safety and Department of Communities superseded the Queensland Department of Families. While the administrative records were retained and remained consistent across these departments, data regarding notifications and substantiations from 1990 to 2007 were recorded in a data management system called the Child Protection Information System (CPIS). After this time, child protection data were stored and collected in a new data management system called the Integrated Client Management System (ICMS). At the time of data extraction, data for the QLD90 cohort were held across the two systems. As a result, unlike for the QLD83 and QLD83/84 datasets, variables regarding the Suspected Child Abuse and Neglect team (SCAN team) involved in the case, and immediate placement action(s) such as out-of-home placements for the QLD90 dataset, could not be retrieved from corporate systems without additional work-arounds by the department. As these work-arounds would have required significant resource expenditure by the department, the decision was made to complete the data extraction excluding variables relating to out-of-home placements and SCAN teams, resulting in their absence from analyses of the QLD90 dataset.

Initial data cleaning of the linked child protection and juvenile justice dataset revealed some missing data and data entry errors throughout the child protection dataset. To ensure consistency across the dataset, decision making processes were followed to address data inconsistencies. If a distinct individual had ever been classified as Indigenous, they retained this classification in the final dataset, even if they were recorded as non-Indigenous at other contacts. If all data were missing regarding Indigenous status, the individual was classified as non-Indigenous. It is acknowledged here, that some individuals included in the non-Indigenous category may in fact be
Indigenous. When the reported sex of the individual changed across contacts, the most commonly recorded sex was retained in the final dataset. If each sex had been reported at equal rates, the last reported sex was retained. The date of birth listed for some cases was a computer default date of 01 January 1990. As all individuals in the dataset were known to be born in 1990, the approximate age in years was considered acceptable for analyses regarding age at maltreatment episodes or maltreatment timing.

4.3.3.2 Basic descriptive data.

4.3.3.2.1 Child protection.

Included in the child protection dataset from the Department of Child Safety were data for 8979 distinct children who together accounted for 22,110 notifications from birth (in the year 1990) through to the age of 18 (in the year 2008). The maximum number of notifications for an individual was 28 ($M = 2.46, SD = 2.75$). There were 1025 (11.4%) Indigenous Australian young people in the dataset, and 4685 (52.2%) females.

Of these 8979 distinct individuals, 4511 distinct individuals received at least one substantiation together accounting for a total of 9641 substantiations. Of the 4511 maltreated individuals, 677 (15%) were Indigenous Australian, and 2432 (54%) were female. Amongst all maltreated individuals, the average age at first substantiation was 8.36 years ($SD = 5.10$), and at final substantiation was 10.17 years ($SD = 4.78$). The maximum number of substantiated events for an individual was 20 ($M = 2.14, SD = 2.03$). Among maltreated individuals, 1644 (36.4%) experienced emotional abuse, 618 (13.7%) experienced sexual abuse, 1841 (40.8%) experienced physical abuse, and 1990 (44.1%) experienced neglect. Overall, 3279 (73%) of maltreated children experienced only one maltreatment type, and 1232 (27%) experienced multiple maltreatment types.

4.3.3.2.2 Youth justice.

Included in the court appearance data were 2409 distinct individuals, together accounting for 7,194 youth court finalisations. When the child protection and youth
justice data were aggregated, the resulting QLD90 dataset contained administrative data for 10,267 distinct individuals. Examination of descriptive data revealed four cases with extensive missing data, including gender and Indigenous status. These four cases were deleted, resulting in a final linked dataset for 10,263 distinct individuals. Of the 10,263 individuals in the QLD90 dataset, 13.2% were Indigenous Australian (n=1352). An additional 13.4% (n=1372) of individuals were of “unknown” Indigenous status. These individuals of unknown Indigenous status were re-classified as “non-Indigenous” in the final sample.

Preliminary examination of the 8975 individuals in the child protection data indicate that approximately 8% of notified but never substantiated individuals received a finalisation in youth court. Amongst the 4511 maltreated individuals in the QLD90 dataset, there were 33 individuals whose first court appearance preceded their first maltreatment notification. These individuals were excluded from analyses examining the links between maltreatment and offending, resulting in a sample of 4478 maltreated individuals for these analyses.

Among maltreated children included in this study (n=4478), 15.7% (n=704) received a guilty conviction in court, representing 7.4% (n=154) of maltreated non-Indigenous females, 16% (n=278) of maltreated non-Indigenous males, 32.6% (n=111) of maltreated Indigenous females and 50.8% (n=161) of maltreated Indigenous males. Importantly, 408 (12.6%) individuals experiencing a single maltreatment type and 296 (24%) of individuals experiencing multiple maltreatment types had a finalised appearance. From an alternative perspective, 265 (10.6%) of those with a single event had a finalised youth court appearance, compared to 216 (16.6%) of those with 2-3 substantiations, and 223 (33.1%) of those with 4 or more substantiations.

Though it was not possible to link the child protection data to formal police cautioning data in the QLD90 dataset, in a separate research project using only the Queensland youth justice administrative data (including police cautions and court appearances) for young people born 1990, Allard et al. (2010) identified that 62.6% of Indigenous males compared to 12.8% of non-Indigenous males, and 27.8% of Indigenous females compared to 6.9% of non-Indigenous females born 1990, had an offending contact with the Queensland youth justice system by the age of 17 years. These offending contacts included police cautions, police youth justice conferences and
juvenile court appearances (Allard et al., 2010). Overall, these offending youths represented 14% of the total population of Queensland youths born 1990 (Allard et al., 2010).

Allard et al. (2010) reported that just over 4% of individuals in the total population of Queensland youths born 1990 (n=57,954) had a finalised juvenile court appearance. Consistently, figures from the QLD90 dataset utilised within this thesis indicate that 4.0% (2329 of 57,954) of QLD youths born 1990 received a guilty conviction in court. Amongst the total population of QLD youths born 1990, 1.4% of non-Indigenous females (380 of 26,600), 4.3% of non-Indigenous males (1219 of 28,320), 13.4% of Indigenous females (207 of 1543), and 35.1% Indigenous males (523 of 1491) received a guilty conviction in youth court.

4.4 The Historical Context Surrounding Child Protection in Queensland

Though the QLD83, QLD83/84 and QLD90 datasets appear directly comparable, it is important to note that the child protection administrative records were produced in a child protection system which underwent extensive change between 1983 and 2008. To demonstrate the importance of Research Question Two: Do the links between maltreatment dimensions and offending change across cohorts?, and to provide a platform for interpretation of results in this thesis, this section presents graphs of cross-sectional administrative data obtained from Queensland child protection departmental annual reports of notifications and substantiations from 1982 to 2009. Maltreatment substantiation trends indicated within these graphs are interpreted and discussed with reference to the historical context surrounding them, or more specifically, significant events occurring within and around the child protection system during this period.

4.4.1 Notifications and substantiations in the Queensland child protection system.

Each year the Department responsible for child protection in Queensland produces an annual report detailing the number of notifications and substantiations received throughout that financial year, and the proportion of these substantiations
falling within each maltreatment subtype (i.e., neglect, physical abuse, emotional abuse, and sexual abuse). These data are cross-sectional, meaning they represent all children and young people, regardless of year of birth, who had contact with the department during that financial year. To produce the graphs presented in this section, individual annual reports from the Queensland child protection system from 1982 to 2008 were accessed via historical Queensland Parliamentary Papers. Figures pertaining to distinct children in contact with the child protection system in each financial year were extracted.

To ensure the direct relevance and comparability of these child protection data, it was necessary to combine them with other data from the jurisdiction which reflect changes to the broader population, rather than only the isolated subsample having contact with the child protection and youth justice systems. Census data from the Australian Bureau of Statistics (ABS), which records population growth and distribution for all Australian States and Territories, are a valuable tool for this purpose. By combining child protection annual figures with ABS census data, the overall numbers of child protection notifications and substantiations per year can be converted to rates per 100,000 individuals aged between 0-18 years of age within the population at that time. This allows a truer representation of actual change to rates of maltreatment notifications and substantiations within the broader population, compared to numbers of notifications and substantiations reported without context.

Figure 4.1 shows annual maltreatment notifications and substantiations (rate per 100,000) in Queensland from the 1982-3 financial year to the 2008-9 financial year.
Figure 4.1. Notifications and substantiations (rate per 100,000) in the Queensland child protection system from the 1982-3 financial year to the 2008-9 financial year.

Upon initial examination, Figure 4.1 appears to indicate a general and steady incline in rates of child maltreatment notifications and substantiations from 1982 through to 1999, followed by a much steeper increase in notifications and substantiations between 1999 and 2004, and a rapid decline between 2005 and 2009. Importantly, across this period, the child protection system in Queensland underwent extensive change and development. Hence, it is essential to acknowledge that these trends in administrative data are in many cases a reflection of changes to service system capacity and response over time, rather than actual rates of maltreatment.

Though the Queensland child protection unit was established 1976 (QLD, 1983) the central registry was not established until 1979 (QLD, 1984), meaning data collection and storage likely improved across this period. Furthermore, Suspected Child Abuse and Neglect teams (SCAN teams) were established in Queensland 1980 “...to provide a more effective approach to the detection and management of child abuse and neglect by co-ordinating the resources of the Department of Children’s Services, the Police and the Health Department.” (QLD, 1984, p. 16). Additionally, in 1985, the central registry was converted from a manual system to a computerised system (QLD, 1985). It is highly possible that these changes improved data collection, storage and reporting,
contributing to the apparent increase in recorded notifications and substantiations over the period.

Additionally, mandatory reporting laws were introduced in Queensland in the 1980s in Queensland, and exposure to domestic violence was newly classified as a form of maltreatment (Child Family Community Australia, 2015). Public debate and awareness of maltreatment continued to increase over this period (Child Family Community Australia, 2015). Significantly, the year 1998 marked the establishment of a Commission of Inquiry into the abuse of children in Queensland institutions (Forde, 1999). The final report of this Inquiry, typically referred to as the Forde Enquiry or the Forde Report was released 1999 (Forde, 1999). The Forde report identified numerous instances in which children in residential care facilities had experienced maltreatment during their time within these care facilities (Forde, 1999). Numerous recommendations were made within the final report regarding improvement of the modern system and facilities to avoid any repeat of these mistakes (Forde, 1999). This report provided significant attention to the overrepresentation of Indigenous Australian children (Forde, 1999). There was extensive media attention provided to this Commission. It is logical to assume that each of the above mentioned external influences increased public awareness, recognition and reporting of child maltreatment, thereby contributing to an increase in reported rates of notifications and substantiations. Overall, the figures included in Figure 4.1 may represent an increase in recognition and reporting of maltreatment, as opposed to an actual increase in maltreatment.

Figure 4.1 indicates a sharp increase in notifications and substantiations from 1999 to 2004. The apparent sharp increase in notifications and substantiations from the year 1999 is most likely due to the introduction of new child protection legislation in Queensland at that time. The functioning of the modern child protection system in Queensland has been guided by two consecutive legislative Acts. From 1965 until 1999, the active legislation was the Children’s Services Act 1965, which guided the functioning of both the child protection and youth justice systems during that period. The Children’s Services Act 1965 was superseded by the Child Protection Act 1999 in response to long term concerns that the Act failed to adequately represent the child protection system and best practice, such as by failing to account for emotional and sexual abuse (Queensland Government, 2015a).
According to Bromfield and Higgins (2004), the enactment of the Child Protection Act 1999 “...redefined the population of children in need of protection” (p. 21). The Children’s Services Act 1965 and the Child Protection Act 1999 differed in relation to the definition of a “child” as well as what constituted a child in need of protection. The newer Act added another year in which the young person could have contact with the department, raising the upper age from 17 years to 18 years, and also represented a shift from a focus on specific parental actions or inactions, to a focus on “harm” or risk of harm to the child. This shift broadened what constituted a child in need of protection (Bromfield & Higgins, 2004). Notably, the Child Protection Act 1999 does not provide any definition for the terms physical, psychological or emotional abuse, neglect or sexual abuse or exploitation, whereas the older Act did provide a definition for neglect.

This legislative change also may have altered recorded maltreatment rates within administrative data by failing to differentiate children “at risk” of harm from those who have already experienced “harm” (Bromfield & Higgins, 2004). Additionally, the Act allowed inclusion of children who have experienced “non-maltreatment” related harm by parents. For example, guided by the Child Protection Act 1999, a child could be recorded as “neglected” or “emotionally abused”, in an instance where a parent failed to protect a child from a non-parent offender who had sexually abused the child (Bromfield & Higgins, 2004). Specifically, in this hypothesised case, though the child experienced “sexual abuse” by a non-parent, he/she was recorded as a case of “neglect” or “emotional abuse” because the parent(s) failed to act to protect them from “harm” (Bromfield & Higgins, 2004).

Figure 4.1 indicates a decline in notifications and substantiations in the Queensland child protection system from around 2004. Importantly, the period from 2003 to 2009 marked a period of significant reform to the Queensland child protection system (Department of Communities, 2010). First, during 2003, the Crime and Misconduct Commission (CMC) conducted a public enquiry into abuse of children in foster care (Department of Communities, 2010). Following on from release of the CMC Enquiry Report early 2004, the then Department of Families was replaced by two separate departments: The Department of Child Safety and the Department of Communities (Department of Communities, 2010). Upon establishment of these new departments, recording of notifications and substantiations for unborn children
commenced, followed by the introduction of a new police operational policy for domestic violence (Department of Communities, 2010). The new police operational policy required police officers who responded to cases of domestic violence to notify child protection services when children resided in the home.

From early 2005, protective advice responses were no longer recorded as notifications, meaning at intake, cases which were deemed unlikely to fall under the jurisdiction of the child protection system were referred away from the system (Department of Communities, 2010). Shortly after, mandatory reporting was expanded to include doctors and nurses (Department of Communities, 2010). It is possible that the largest impact occurred through state wide implementation of Structured Decision Making tools in 2006, followed by the launch of the new database, ICMS. These system reforms significantly changed the process of notifications, investigations and substantiations in the Queensland child protection system (Department of Communities, 2010).

Overall, the changes to the child protection system, as listed above, most likely resulted in the rapid decline in notifications and substantiations evident in Figure 4.1 from 2005. While it is possible that actual rates of maltreatment declined in this period, it is nearly impossible to explore this possibility via the isolated use of cross-sectional administrative data. Researchers have previously noted the need for an Australian national incidence study using self-report data (Child Family Community Australia, 2014). At a minimum, the information presented in this section clearly indicates the need to consider historical context in research on child maltreatment, particularly when administrative data are utilised.

In relation to the datasets used in the three studies of this thesis, it should be noted that individuals born 1983 and 1984 had exited the child protection system prior to the dramatic increase in notifications and substantiations noted after the year 1999 in Figure 4.1. Comparatively, individuals born 1990 were only aged around nine years at this time, and were still under the jurisdiction of the child protection system following the above-mentioned system reforms. Hence, there is clear potential for variations between the cohorts with regards to notification and substantiation trends across the life-course.
4.4.2 Substantiations of distinct maltreatment subtypes in the QLD child protection system.

As discussed earlier in this chapter, it has been an ongoing responsibility of the department responsible for child protection administration, to record the most serious harm type experienced by each child at the time of substantiation. Regardless of the number of maltreatment types experienced by the child, only the harm type classified as the most serious at the time, has ever been recorded in child protection administrative data. As mentioned above, these harm types are neglect, physical abuse, sexual abuse and emotional abuse. Figure 4.2 shows the percentage of all cases reported in each financial year from 1982 to 2009 falling within each “most serious harm type”.

Figure 4.2 indicates an overall decline in sexual abuse and physical abuse, and an overall incline in emotional abuse. Interestingly, these declines in sexual abuse and physical abuse in Queensland administrative data are generally consistent with declines noted by Finkelhor and Jones (2006) using data from the USA. Finkelhor and Jones (2006) noted a decrease in sexual abuse and physical abuse in the USA over the period
1993 to 2004. Finkelhor and Jones (2006) did not include figures pertaining to rates of emotional abuse across this period.

According to Child Family Community Australia (2015) due to changing awareness of different maltreatment subtypes and their potential effects, assessments regarding the most serious harm type at any given time may have changed. As described in earlier chapters of this thesis, within Australia, physical abuse received growing attention in the 1960s, followed by sexual abuse in the 1980s, and then neglect followed by emotional abuse (including exposure to family violence) in the 1990s (Child Family Community Australia, 2015). Due to this, Bromfield and Higgins (2004) have questioned the reliability of child protection data when determining the prevalence and effects of maltreatment subtypes. As argued by Bromfield and Higgins (2004, p. 20) “...legislative changes have resulted in new interpretations of what actions may constitute specific forms of abuse or neglect. As a result, the reliability and validity of child protection data collected regarding specific maltreatment types is highly questionable”. The patterns indicated in Figure 4.2 do appear to mimic reported patterns of community awareness and research attention over these periods. The possibility that these changing trends could affect observed maltreatment and offending links over time, must be explored.

### 4.4.3 Variations by sex and Indigenous status.

Lastly, it is important to consider potential variations across maltreatment types experienced by males compared to females, and Indigenous Australian children and young people compared to non-Indigenous children and young people. Figures 4.3 and 4.4, show the changing percentages of males and females, respectively, substantiated for each “most serious harm type” from 1982 to 2003.
Figure 4.3. The percentage of males in each financial year substantiated for each “most serious harm type”.

Figure 4.4. The percentage of females in each financial year substantiated for each “most serious harm type”.

Comparison of Figures 4.3 and 4.4 indicates some gender variation in these changing percentages. Though patterns of substantiated harm types appear similar in the period following the mid-1990s, the period preceding this shows a different distribution
of sexual abuse relative to the other harm types, with higher sexual abuse percentages for females compared to males.

Lastly, Figures 4.5 and 4.6 show the changing percentages of Indigenous Australian children young people and non-Indigenous Australian children young people, respectively, substantiated for each “most serious harm type” from 1995 to 2009.
Comparison of Figures 4.5 and 4.6 indicates differences between Indigenous children and young people and non-Indigenous children young people with regards to the changing proportions of each group substantiated for each “most serious harm type”.
types” over time. While patterns of substantiations for sexual abuse appear consistent across these groups, patterns of substantiations for neglect, physical abuse and emotional abuse show considerable variation over time. Particularly notable, are the different proportions of each group substantiated for emotional abuse, following the year 2005.

Though the graphs presented in this section rely on cross-sectional data, they provide a useful tool for examining the changing nature of child protection administrative data at a State level, across time. Specifically, the above graphs indicate the potential importance of historical context, and cohort variations in child maltreatment research, as well as the potential impact of gender and Indigenous status on observed maltreatment and youth offending links. The observations made in this section highlight some potential restrictions for interpretation of results in this thesis regarding the links between maltreatment types and offending. In particular, the graphs indicate that administrative data largely reflects recognition, understanding and reporting of maltreatment as well as service system capacity and response, as opposed to only reflecting actual lived experiences of maltreatment.

4.5 Terminology and data limitations across the Studies

Extending beyond the observations made throughout the preceding section, it is essential to note that across the three studies of this thesis, the terms “maltreated” and “maltreatment” are used frequently. Due to the reliance of administrative data which is affected by legislation in this State, in this thesis these terms refer to substantiated cases of harm or risk of harm. It is also acknowledged here that administrative data do not necessarily reflect the lived experiences of individuals. It is possible that individuals experienced maltreatment that was not reported, or could not be substantiated, preventing them from being appropriately represented in the datasets of this thesis.

Likewise, the reported substantiated harm types, namely “neglect”, “sexual abuse”, “physical abuse” or “emotional abuse”, represent the harm type classified by a departmental worker as being the most severe at the time of assessment. It is possible that individuals experienced multiple subtypes of maltreatment at a single time, but Departmental procedures resulted in only the most severe harm type being recorded. These classifications, therefore, do not necessarily reflect the full extent of the
maltreatment, harm, or risk of harm, experienced by an individual at the time of notification or substantiation, or across the life-course. As argued by Lau et al. (2005, p. 548) administrative records may be “...better characterized as groups of report types rather than reified as actual constellations of maltreatment experiences”.

Consistent with the above, it should be noted that official records of youth offending likely exclude a large portion of youth offending that goes undetected and unreported. In particular, analyses of the QLD90 cohort rely solely on court data, and therefore do not account for the vast majority of youth offending that was addressed through diversion. Research using self-reported youth offending may find different results. Each of the above limitations should be acknowledged in interpretation of the results of the three Studies of this thesis.

4.6 Chapter Summary and Conclusions

The three studies of this thesis address the two research questions: Research Question 1: Which maltreatment dimensions are related to youth offending? and Research Question 2: Do the links between maltreatment dimensions and youth offending change across cohorts? Together these three separate, yet interrelated studies provide comprehensive response to these two primary research questions. Each study provides a different insight into the links between maltreatment dimensions and youth offending, and the impact of historical context on these observed links.

Chapter Five presents Study 1, which uses binary logistic regression. Chapter Six presents Study 2, which uses the semi-parametric group-based trajectory analysis. Lastly, Chapter Seven presents Study 3, which uses the conjunctive analysis of case configurations. Each chapter provides a description of the analytic method, the results of the analyses which address the research questions, and a concluding discussion of associated strengths and limitations. The thesis concludes with Chapter Eight, which is a discussion of the combined results from the three studies, and the implications of these results for theory, policy, practice and future research.
Chapter Five: Study 1: Binary Logistic Regression

5.1 Chapter Overview

This chapter presents the methodology and results of Study 1 which was designed to address the two primary research questions: Research Question 1: Which maltreatment dimensions are related to youth offending? and Research Question 2: Do the links between maltreatment dimensions and youth offending change across cohorts? The methodology of this study was drawn from Stewart et al. (2002) and Stewart et al. (2005). These authors subjected the QLD83 and QLD83/84 datasets, respectively, to binary logistic regression to determine whether youth offending could be predicted from maltreatment experiences. This methodology provides a prospective examination of the relationship between maltreatment experiences and youth offending.

To address Research Question 1: Which maltreatment dimensions are related to youth offending?, the QLD90 cohort dataset is subjected to binary logistic regression to determine whether youth offending can be predicted from maltreatment experiences using variables that are consistent with Stewart et al. (2002, 2005). Consistent with Stewart et al. (2002, 2005), under examination are neglect, physical abuse, sexual abuse, emotional abuse, maltreatment frequency, and maltreatment timing. Gender and Indigenous status are also included in the analysis. To address Research Question 2: Do the links between maltreatment dimensions and youth offending change across cohorts?, the results of the QLD90 logistic regression are compared to the published results of the QLD83 (Stewart et al., 2002) and QLD83/84 (Stewart et al., 2005) logistic regressions.

The method of this study is presented in section 5.2. The results section of this chapter (section 5.3) is divided into two main subsections. The first subsection 5.3.1 addresses Research Question One. The second subsection 5.3.2 addresses Research Question Two. This chapter is concluded with a brief summary of the key findings from the completed study, and a discussion of the strengths and limitations of its design, thereby providing the rationale and introduction for Study 2 which is presented in Chapter Six.
5.2 Method

Logistic regression allows examination of the effects of multiple predictor variables on a single categorical outcome variable (Pallant, 2011), and calculates the probability of each possible outcome based upon the presence, absence or degree of each predictor variable (Tabachnick & Fidell, 2001). Logistic regression does not assume a linear relationship between predictor variables and the outcome variable, or require the predictor variables to be normally distributed or of equal variance in each group (Tabachnick & Fidell, 2001). It can be used with any combination of continuous, discrete and dichotomous variables (Tabachnick & Fidell, 2001). It is therefore suitable for use with the QLD83, QLD83/84 and QLD90 datasets to investigate the links between maltreatment experiences and youth offending outcomes. In this study, the logistic regression is designed to determine whether engaging in youth crime (as represented by receiving a conviction) can be predicted by a selection of maltreatment-related variables.

5.2.1 QLD83 and QLD83/84 variables.

Stewart et al. (2002) subjected the QLD83 dataset to binary logistic regression to determine whether youth offending (represented by the presence or absence of at least one conviction in court before the age of 17 years) could be predicted by child maltreatment experiences. Stewart et al. (2005) performed the same analysis on the QLD83/84 combined dataset with a broader outcome variable representing the presence or absence of at least one conviction in court or formal police caution before the age of 17 years. Stewart et al. (2002, 2005) each used 11 predictor variables including sex (female/male), Indigenous status (not Indigenous/Indigenous), age at first substantiated incident, age at final substantiated incident, emotional abuse (no/yes), neglect (no/yes), physical abuse (no/yes), sexual abuse (no/yes), number of notifications, out of home placement (no/yes), and number of substantiations.

5.2.2 QLD90 variables.

For the QLD90 cohort dataset, the outcome variable was dichotomous (no conviction/conviction). The ten predictor variables were sex (female/male), Indigenous status (not Indigenous/Indigenous), age at first substantiation, age at final substantiation,
emotional abuse (no/yes), neglect (no/yes), physical abuse (no/yes), sexual abuse (no/yes), number of notifications, and number of substantiations. The variable ‘number of notifications’ represents the total number of times a child was reported to the Department for a suspected maltreatment event (regardless of whether the notification was substantiated or unsubstantiated), while ‘number of substantiations’ represents the total number of notifications across the individual’s life-course which resulted in a substantiated outcome.

As noted in Chapter Three, data regarding out of home placements were not available for the QLD90 dataset at the time the data were extracted. Therefore, this variable was not included in the analysis of the QLD90 dataset. Also, as data regarding formal police cautioning were not obtained for the QLD90 dataset, the outcome variable representing youth offending was limited to the presence or absence of a conviction in court prior to the age of 17 years, allowing direct comparison with results pertaining to the QLD83 dataset, and partial comparison with results from the QLD83/84 combined dataset.

5.3 Results

This results section is divided into two main parts. Section 5.3.1 provides a response to Research Question One: Which maltreatment dimensions are related to youth offending? via analysis of the QLD90 dataset using binary logistic regression. Section 5.3.2 provides a response to Research Question Two: Do the links between maltreatment dimensions and youth offending change across cohorts? via comparison of the results of the analysis of the QLD90 dataset with previously published results regarding the QLD83 and QLD83/84 datasets.

5.3.1 Research Question One: Which maltreatment dimensions are related to youth offending?

To ensure accuracy and integrity of results, the binary logistic regression was performed on the QLD90 dataset according to the procedure outlined by Pallant (2011). The data were analysed using IBM SPSS Statistics Package Version 22. As maltreatment dimensions (type, timing and frequency) remain the focus in this study,
only individuals with at least one substantiated maltreatment event across the life-course were included in the analyses. There were 4,511 individuals in the QLD90 dataset with at least one substantiated maltreatment event over the life-course. Importantly, 33 individuals were excluded from the analyses due to their first recorded conviction preceding their first substantiated maltreatment event. The final analyses included 4,478 individuals (317 Indigenous males, 341 Indigenous females, 1,739 non-Indigenous males, 2,081 non-Indigenous females).

5.3.1.1 QLD90 binary logistic regression.

As noted in section 5.2.2 the outcome variable was dichotomous (no conviction/conviction). The ten predictor variables were sex (female/male), Indigenous status (not Indigenous/Indigenous), age at first substantiation, age at final substantiation, emotional abuse (no/yes), neglect (no/yes), physical abuse (no/yes), sexual abuse (no/yes), number of notifications, and number of substantiations. The distribution of individuals in the QLD90 dataset across the predictor variables and outcome variables is presented in Table 5.1.
Table 5.1

Descriptive figures showing distribution of the QLD90 cohort dataset across the predictor and outcome variables

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</tr>
<tr>
<td></td>
<td>No</td>
<td>3229</td>
<td>631</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neglect</td>
<td>Yes</td>
<td>1554</td>
<td>421</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>2220</td>
<td>283</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age First Substantiation</td>
<td></td>
<td>8.3 (5.1)</td>
<td></td>
<td>8.4 (5.0)</td>
<td></td>
</tr>
<tr>
<td>Age Final Substantiation</td>
<td></td>
<td>9.9 (4.9)</td>
<td></td>
<td>11.6 (4.0)</td>
<td></td>
</tr>
<tr>
<td>N Notifications</td>
<td></td>
<td>3.2 (3.1)</td>
<td></td>
<td>5.5 (4.5)</td>
<td></td>
</tr>
<tr>
<td>N Substantiations</td>
<td></td>
<td>2.0 (1.8)</td>
<td></td>
<td>3.1 (2.8)</td>
<td></td>
</tr>
</tbody>
</table>

The results of the regression are reported using Pallant’s (2011) suggested outline. The full model including 10 predictor variables was statistically significant, $\chi^2(10, N = 4478) = 646.20$, $p < .001$, which suggests that the model could distinguish between those who received a conviction and those who did not. The variance explained by the model ranged between 13.4% (Cox and Snell $R^2$) and 23.1% (Nagelkerke $R^2$), with 85.5% of the cases correctly classified, a small improvement over the 84.3% correctly classified in starting Block 0. It is important to note here that the sensitivity of the model was low, with only 20.2% of offenders correctly classified, compared to 97.7% of non-offenders correctly classified. Overall though, the positive predictive power of the model was 62.3%, and the negative predictive power was 86.8%. The Hosmer-Lemeshow Goodness of Fit Test was not significant, indicating good fit $\chi^2(8, N= 4478) = 4.39$, $p = .82$. Table 5.2, shows regression coefficients, Wald
statistics, odds ratios and 95% confidence limits for each of the 10 predictor variables included in the regression.

Table 5.2

**Logistic Regression analysis predicting youth offending as a function of maltreatment variables**

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>p</th>
<th>Odds Ratio</th>
<th>95% C.I. for Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td>.90</td>
<td>.09</td>
<td>90.94</td>
<td>1</td>
<td>.00</td>
<td>2.45</td>
<td>2.04</td>
</tr>
<tr>
<td><strong>Indigenous status</strong></td>
<td>1.68</td>
<td>.10</td>
<td>260.00</td>
<td>1</td>
<td>.00</td>
<td>5.38</td>
<td>4.39</td>
</tr>
<tr>
<td>Age first sub.</td>
<td>.02</td>
<td>.02</td>
<td>1.82</td>
<td>1</td>
<td>.18</td>
<td>1.02</td>
<td>.99</td>
</tr>
<tr>
<td>Age final sub.</td>
<td>.08</td>
<td>.02</td>
<td>19.86</td>
<td>1</td>
<td>.00</td>
<td>1.08</td>
<td>1.05</td>
</tr>
<tr>
<td><strong>N notifications</strong></td>
<td>.14</td>
<td>.02</td>
<td>39.19</td>
<td>1</td>
<td>.00</td>
<td>1.15</td>
<td>1.10</td>
</tr>
<tr>
<td>N substantiations</td>
<td>-.05</td>
<td>.04</td>
<td>1.49</td>
<td>1</td>
<td>.22</td>
<td>.95</td>
<td>.88</td>
</tr>
<tr>
<td>Emotional abuse</td>
<td>-.01</td>
<td>.12</td>
<td>.00</td>
<td>1</td>
<td>.95</td>
<td>.99</td>
<td>.79</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>.02</td>
<td>.12</td>
<td>.04</td>
<td>1</td>
<td>.85</td>
<td>1.02</td>
<td>.81</td>
</tr>
<tr>
<td><strong>Sexual abuse</strong></td>
<td>-.49</td>
<td>.16</td>
<td>8.90</td>
<td>1</td>
<td>.00</td>
<td>.61</td>
<td>.44</td>
</tr>
<tr>
<td><strong>Neglect</strong></td>
<td>.30</td>
<td>.13</td>
<td>5.67</td>
<td>1</td>
<td>.02</td>
<td>1.35</td>
<td>1.05</td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>-4.11</td>
<td>.19</td>
<td>489.91</td>
<td>1</td>
<td>.00</td>
<td>.02</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Variables where *p* < .05 are in boldface.

As shown in Table 5.2, six predictor variables made a statistically significant unique contribution to the model. These were sex, Indigenous status, age at final substantiation, number of notifications, sexual abuse and neglect. According to the odds ratios, being male and Indigenous were the strongest predictors of offending. Specifically, the odds ratios indicate that maltreated males were over two times more likely than maltreated females to offend, while maltreated Indigenous-Australian children were over five times more likely to offend than maltreated non-Indigenous Australian children.
In relation to the impact of maltreatment types, experiences of neglect appeared to increase risk of offending, while physical abuse and emotional abuse made no unique significant contribution. Interestingly, sexual abuse shared a negative relationship with offending. Data in Table 5.2 suggest that offending was less likely amongst young people with substantiated sexual abuse, than those without substantiated sexual abuse.

Interpretation of results regarding the impact of maltreatment timing was challenging. The odds ratios indicate that offending was more likely as age at final substantiation increased, yet age at first substantiation was not significant. This result may suggest that maltreatment occurring later in childhood or adolescence is more likely to result in offending than earlier maltreatment. However, these results cannot be used in isolation to confidently discuss the impact of maltreatment timing on maltreatment and offending links. Rather, additional analyses are necessary to investigate this link further, particularly to determine the specific relationship between increasing age and increased risk of offending. An alternative method of assessing the impact of maltreatment timing is explored in section 5.3.1.2 of this chapter, to determine whether maltreatment during adolescence results in a greater risk of offending than maltreatment during early childhood and middle childhood.

Finally, the impact of maltreatment frequency was also difficult to determine. Specifically, the number of notifications experienced by an individual did appear to affect maltreatment and offending links, while the number of substantiations was not a significant predictor. In particular, as the number of notifications increased, the risk of offending also slightly increased. Technically, in this dataset notifications can only be interpreted to represent contact with the child protection department, rather than actual maltreatment. Importantly, there was a high bivariate correlation ($r=.86$), between the two predictor variables ‘number of notifications’ and ‘number of substantiations’ (Tolerance=.25, VIF=4.0; Tolerance=.21, VIF=4.8 respectively). Stewart et al. (2002) also noted a strong relationship between these two variables in their analyses, yet retained both variables in their regression (discussed later in this chapter). The potential impact of this correlation in the QLD90 dataset is explored in the next section (section 5.3.1.1), which presents the process of assumption checking.
5.3.1.1.1 Assumption checking.

After performing the binary logistic regression presented in Table 5.2, standardised residual values were checked to account for cases that were not well explained by the model. The regression was re-run excluding 204 cases with residual scores above 2.5, leaving 4274 individuals in the analysis. Again, the model was significant, $\chi^2 (10, N= 4274) = 1062.97, p<.001$. The variance explained by the model ranged between 22% (Cox and Snell $R$ square) and 42.7% (Nagelkerke $R$ Squared), with 89.7% of the cases being correctly classified, however, the Hosmer-Lemeshow Goodness of Fit Test indicated poor fit $\chi^2 (8, N= 4274) = 67.83, p<.001$. Importantly, removal of these cases did result in a change to significance of the variable ‘age at first substantiation’, but did not change the significance of the remaining predictor variables. Specifically, “age at first substantiation” did not reach significance when the extreme cases were included in the analysis, but did reach significance ($p< .05$) when these cases were excluded, with odds ratios suggesting a negative relationship between age at first substantiation and offending. It is possible that this change to significance was more indicative of a problem with variable selection, rather than outliers. To avert the risk of excluding theoretically important cases from the analysis, the regression results presented in this chapter include all cases, including those with extreme residual scores.

To test the potential impact of the correlation between ‘number of notifications’ and ‘number of substantiations’ in the QLD90 regression, an alternative regression was run excluding the variable ‘number of notifications’. The variable ‘number of substantiations’ was retained in place of ‘number of notifications’ in the exploratory reanalysis because it was deemed to have greater policy relevance due to the inability of a Government Department to engage in child protection efforts for unsubstantiated notifications.

The model including 9 predictor variables was statistically significant, $\chi^2 (9, N= 4478) = 607.83, p<.001$. The variance explained by the model ranged between 12.7% (Cox and Snell $R$ square) and 21.8% (Nagelkerke $R$ Squared), with 85.4% of the cases being correctly classified. Though the Hosmer-Lemeshow Goodness of Fit Test indicated good fit $\chi^2 (8, N= 4478) = 4.2, p=.84$, the above figures indicate no improvement to the model following removal of the variable ‘number of notifications’.
Importantly, the removal of the variable ‘number of notifications’ did have an impact on the interpretation of the results relating to the predictor variable ‘number of substantiations’, which reached significance when ‘number of notifications’ was excluded, but did not reach significance when ‘number of notifications’ was included. Specifically, when ‘number of notifications’ was excluded from the analysis, the results indicated that the likelihood of offending was higher as ‘number of substantiations’ increased. The significance of the remaining predictor variables did not change depending on the inclusion or exclusion of ‘number of notifications’. Based on the above observations, the inclusion of both ‘number of notifications’ and ‘number of substantiations’ in the analysis reported in Table 5.2 is considered optimal, as this enables the most direct comparison with the results of Stewart et al. (2002, 2005) in section 5.3.2 of this results section.

Perhaps future analyses not seeking comparison with existing results, should consider exclusion of the variable ‘number of notifications’, with inclusion of the variable ‘number of substantiations’ in its place, as it is likely that each of these variables can act as a significant predictor in the absence of the other, but ‘number of substantiations’ likely has the greatest policy relevance of the two. Though, an alternative possibility is that a higher number of notifications may indicate a challenging developmental context for the child which may itself increase risk of offending. Qualitative data would most likely assist in understanding these results. Unfortunately qualitative data are not available in this thesis.

5.3.1.2 QLD90 alternative binary logistic regression: Additional exploration of maltreatment timing.

As noted earlier, the results of the initial binary logistic regression presented in Table 5.2 indicate that offending was more likely as age at final substantiation increased, yet age at first substantiation was not significant. To further investigate the impact of maltreatment timing on offending, a second logistic regression was modelled using categorical maltreatment timing variables. These categorical variables for maltreatment timing were adapted from Thornberry et al. (2001). Thornberry et al. (2001) examined the impact of the timing of maltreatment on offending via three categorical variables, namely “early childhood” which encompassed 0-5 years, “late
childhood” which encompassed 6-11 years (referred to as “middle childhood” in this thesis), and adolescence which represented ages 12+ years.

In this logistic regression, the outcome variable was dichotomous (conviction/no conviction). The 11 predictor variables were sex (female/male), Indigenous status (not Indigenous/Indigenous), early childhood maltreatment (no/yes), middle childhood maltreatment (no/yes), adolescent maltreatment (no/yes), emotional abuse (no/yes), neglect (no/yes), physical abuse (no/yes), sexual abuse (no/yes), number of notifications, and number of substantiations. Classifications of early childhood, middle childhood, and adolescence are consistent with Thornberry et al. (2001) where early childhood encompassed 0-5 years, middle childhood encompassed 6-11 years (labelled “late childhood” in Thornberry et al., 2001), and adolescence represented ages 12+ years. The distribution of individuals in the QLD90 dataset across these 11 predictor variables and the outcome variables is presented in Table 5.3.
Table 5.3

Descriptive figures showing distribution of the QLD90 cohort dataset across the predictor and outcome variables

<table>
<thead>
<tr>
<th></th>
<th>Conviction</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>M (SD)</td>
<td>n</td>
<td>M (SD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>Female</td>
<td>2157</td>
<td>265</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>1617</td>
<td>439</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indigenous</td>
<td>Yes</td>
<td>386</td>
<td>272</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>3388</td>
<td>432</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early childhood maltreatment</td>
<td>Yes</td>
<td>1137</td>
<td>195</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>2637</td>
<td>509</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle childhood maltreatment</td>
<td>Yes</td>
<td>1275</td>
<td>279</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>2499</td>
<td>425</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adolescent maltreatment</td>
<td>Yes</td>
<td>2104</td>
<td>530</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
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<td>174</td>
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<tr>
<td>Emotional abuse</td>
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<td>299</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>2435</td>
<td>405</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical abuse</td>
<td>Yes</td>
<td>1502</td>
<td>326</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>2272</td>
<td>378</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Sexual abuse</td>
<td>Yes</td>
<td>545</td>
<td>73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>3229</td>
<td>631</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neglect</td>
<td>Yes</td>
<td>1554</td>
<td>421</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>2220</td>
<td>283</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N Notifications</td>
<td></td>
<td>3.2 (3.1)</td>
<td>5.5 (4.5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N Substantiations</td>
<td></td>
<td>2.0 (1.8)</td>
<td>3.1 (2.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It may be argued that categorical variables for maltreatment timing allow more accurate determination of the effect of age at maltreatment. Specifically, using a continuous variable, as demonstrated in Table 5.2, only allows a conclusion regarding the effect of increasing age, while using a categorical variable allows greater specificity regarding the significance of maltreatment during a particular developmental period when compared to other developmental periods.

The full model including 11 predictor variables was statistically significant, $\chi^2 (11, N= 4478) = 660.99, p<.001$. This suggests that the model could distinguish between those who received a conviction and those who did not. The variance explained by the
model ranged between 13.7% (Cox and Snell R square) and 23.6% (Nagelkerke R Squared), with 85.6% of the cases being correctly classified, which is a small improvement over the 84.3% correctly classified in starting Block 0. It is important to note here that the sensitivity of the model was low, with only 20.5% of offenders correctly classified, compared to 97.8% of non-offenders correctly classified. Overall though, the positive predictive power of the model was 63.4%, and the negative predictive power was 86.8%. The Hosmer-Lemeshow Goodness of Fit Test was not significant, indicating good fit $\chi^2 (8, N= 4478) = 9.05, p=.34$. The regression coefficients, Wald statistics, odds ratios and 95% confidence limits for each of the 11 predictor variables included in the regression are presented in Table 5.4.

Table 5.4

* Logistic Regression analysis predicting youth offending as a function of maltreatment variables, using categorical variables for maltreatment timing

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>Df</th>
<th>p</th>
<th>Odds Ratio</th>
<th>95% C.I.for Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>.90</td>
<td>.09</td>
<td>91.06</td>
<td>1</td>
<td>.00</td>
<td>2.45</td>
<td>2.04</td>
</tr>
<tr>
<td>Indigenous status</td>
<td>1.68</td>
<td>.10</td>
<td>259.04</td>
<td>1</td>
<td>.00</td>
<td>5.36</td>
<td>4.37</td>
</tr>
<tr>
<td>Early childhood</td>
<td>-.34</td>
<td>.13</td>
<td>6.74</td>
<td>1</td>
<td>.01</td>
<td>.71</td>
<td>.55</td>
</tr>
<tr>
<td>Middle childhood</td>
<td>-.01</td>
<td>.13</td>
<td>.00</td>
<td>1</td>
<td>.95</td>
<td>.99</td>
<td>.77</td>
</tr>
<tr>
<td>Adolescence</td>
<td>.80</td>
<td>.14</td>
<td>32.07</td>
<td>1</td>
<td>.00</td>
<td>2.23</td>
<td>1.69</td>
</tr>
<tr>
<td>N notifications</td>
<td>.14</td>
<td>.02</td>
<td>39.76</td>
<td>1</td>
<td>.00</td>
<td>1.15</td>
<td>1.10</td>
</tr>
<tr>
<td>N substantiations</td>
<td>-.05</td>
<td>.04</td>
<td>1.29</td>
<td>1</td>
<td>.26</td>
<td>.96</td>
<td>.88</td>
</tr>
<tr>
<td>Emotional abuse</td>
<td>-.02</td>
<td>.12</td>
<td>.03</td>
<td>1</td>
<td>.87</td>
<td>.98</td>
<td>.78</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>.01</td>
<td>.12</td>
<td>.01</td>
<td>1</td>
<td>.94</td>
<td>1.01</td>
<td>.80</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>-.49</td>
<td>.16</td>
<td>8.87</td>
<td>1</td>
<td>.00</td>
<td>.61</td>
<td>.45</td>
</tr>
<tr>
<td>Neglect</td>
<td>.29</td>
<td>.12</td>
<td>5.56</td>
<td>1</td>
<td>.02</td>
<td>1.34</td>
<td>1.05</td>
</tr>
<tr>
<td>Constant</td>
<td>-3.51</td>
<td>.16</td>
<td>508.01</td>
<td>1</td>
<td>.00</td>
<td>.03</td>
<td></td>
</tr>
</tbody>
</table>

*Note. Variables where $p<.05$ are in boldface.*
Consistent with the first regression presented in this chapter, the strongest predictors of offending were being male and Indigenous. Again, odds ratios indicate that maltreated males were over two times more likely than maltreated females to offend, and maltreated Indigenous Australian young people may be up to five times more likely to offend than maltreated non-Indigenous Australian young people. Again, neglect appeared to increase the likelihood of offending, while sexual abuse shared a negative relationship with offending. Consistent with the results of the first regression analysis, in this regression analysis ‘number of notifications’ was positively related to offending, while ‘number of substantiations’ did not reach significance. This may suggest that increased contact with the Department is associated with offending, or may indicate that the correlation between notifications and substantiations is preventing the number of substantiations reaching significance. Alternatively, a high number of notifications may indicate other risks within the child’s living environment, which increases risk of offending. Though additional analyses are required, the results of this analysis may indicate that as maltreatment frequency increases, so too does risk of offending, but it is not possible to confidently make this conclusion on these results alone. The impact of maltreatment frequency is examined further in Study 2 and Three.

Perhaps most importantly, the results of this second binary logistic regression provide greater clarity regarding the effects of the timing of maltreatment. Specifically, the odds ratios indicate that maltreatment occurring in adolescence increased risk of offending, while middle childhood maltreatment shared no relationship with offending. Interestingly, early childhood maltreatment shared a significant negative relationship with offending, suggesting that offending young people were less likely to have been maltreated in early childhood than non-offending young people. The results of this second regression provide greater clarity regarding the impact of maltreatment timing. Specifically, only maltreatment that occurred in adolescence significantly increased the risk of offending.

5.3.1.2 Assumption checking.

After performing this binary logistic regression, standardised residual values were checked to account for cases not well explained by the model. The regression was re-run excluding 197 cases with residual scores above 2.5, leaving 4,281 individuals in
the analysis. Again, the model was significant, $\chi^2$ $(11, N=4281) = 1089.40, p<.001$. The variance explained by the model ranged between 22.5% (Cox and Snell $R$ square) and 43.3% (Nagelkerke $R$ Squared), with 89.7% of the cases being correctly classified, however, the Hosmer-Lemeshow Goodness of Fit Test was significant, indicating poor fit $\chi^2$ $(8, N=4281) = 74.76, p<.001$. Importantly, interpretation of the significance of the predictor variables did not change depending on whether outliers were retained or excluded. In light of these observations, outliers were retained and the analyses were reported including extreme cases.

As with the preceding logistic regression, the predictor variables ‘number of notifications’ and ‘number of substantiations’ showed a high bivariate correlation ($r=86$; Tolerance=.25, VIF=4.1; and Tolerance=.21, VIF=4.8 respectively). The analysis was re-run excluding the variable ‘number of notifications’. The model including 9 predictor variables was statistically significant, $\chi^2$ $(10, N=4478) = 622.05, p<.001$. The variance explained by the model ranged between 13% (Cox and Snell $R$ square) and 22.3% (Nagelkerke $R$ Squared), with 85.6% of the cases being correctly classified. The Hosmer-Lemeshow Goodness of Fit Test indicated good fit $\chi^2$ $(8, N=4478) = 6.99, p=.54$. Again, ‘number of substantiations’ reached significance in the absence of ‘number of notifications’, while the significance of the other remaining predictor variables did not change. The above figures suggest no improvement over the model including 10 predictor variables. Influenced by the preceding results, and to allow comparability with the previous analyses, retention of both variables was considered optimal.

5.3.1.3 Summary and discussion of results addressing Research Question One.

Taken together, the results of the two logistic regression analyses using the QLD90 dataset indicate that being male and Indigenous are strong predictors of offending amongst maltreated individuals in the QLD90 dataset. Maltreated males are more likely than maltreated females to offend, and maltreated Indigenous Australian young people are more likely to offend than maltreated non-Indigenous young people. The significant predictive value of Indigenous status with regards to maltreatment and offending links assists in supporting earlier arguments made throughout this thesis regarding the need for a larger body of research using Australian data. Clearly,
additional research examining the impact of maltreatment for Indigenous Australian young people is necessary, particularly to determine the relevance of international data and research conclusions to this population. The impact of Indigenous status on maltreatment and offending links is examined further in Study 2 and Study 3 of this thesis. Importantly, the use of Conjunctive Analysis of Case Configurations (CACC) in Study 3 allows separate examination of maltreatment experiences and offending outcomes of maltreated Indigenous males, Indigenous females, non-Indigenous males and non-Indigenous females, thereby allowing consideration of possible subgroup differences.

With regards to timing of maltreatment, the results of the binary logistic regressions using the QLD90 cohort dataset suggest that maltreatment during adolescence increases risk of offending, while maltreatment in early childhood and middle childhood does not. Of the four possible maltreatment subtypes, neglect was the only maltreatment type to significantly increase risk of offending, while sexual abuse shared a significant negative relationship with offending.

The results were less clear in identifying the impact of maltreatment frequency. The results of the analyses suggest that as the number of notifications increase, so too does risk of offending. A high bivariate correlation between number of notifications and number of substantiations created difficulties with interpretation of results. It is possible that number of substantiations, though not significant in the reported analyses, may also increase risk of offending. The results of this study indicate that alternative examinations of maltreatment frequency are required to explore the links between maltreatment frequency and offending. Maltreatment frequency is a variable of interest in both Study 2 and Study 3.

In summary, it may be concluded from the above results that sex, Indigenous status, maltreatment timing and type, and maltreatment frequency should receive additional examination in later analyses. Though the results of the regression did provide some indication of the relevance of these variables to maltreatment and offending links, alternative analyses are required to further investigate the nature of their impact. Similarly, alternative analyses are required to further investigate potential overlap or interactions between these variables. These variables are included in Study 2 and Three. Alternative operationalisation of key variables and the application of
alternative analytic strategies may provide additional clarity regarding the nature of the relationships between maltreatment dimensions, sex, and Indigenous status and subsequent youth offending. Lastly, it is important to acknowledge that no indicator of maltreatment severity was included in the analysis of the QLD90 dataset due to a lack of available data. It is possible that inclusion of some indicator of severity of maltreatment may have altered the significance of other predictor variables. Unfortunately, this possibility cannot be examined here.

As noted in earlier chapters of this thesis, generalisability of results from single sources of data is limited, potentially due to, among other things, variability arising from historical context. To determine the potential impact of historical context on the observed maltreatment and offending links, the remainder of this results section is devoted to comparison of the above described results for the QLD90 dataset with previously published results relating to the QLD83 and QLD83/84 datasets.

### 5.3.2 Research Question Two: Do the links between maltreatment dimensions and youth offending change across cohorts?

To address the second research question, the results for the QLD90 dataset are compared here to previously published, logistic regression results regarding the QLD83 and QLD83/84 datasets. First, the published results of Stewart et al. (2002) using the QLD83 dataset are presented, followed by the published results of Stewart et al. (2005) using the QLD83/84 combined dataset. Though there is overlap between the data included in the QLD83 and QLD83/84 datasets, comparisons were performed with each to ensure the most comprehensive examination of historical context possible. To be clear, the data and tables presented in this section pertaining to the QLD83 and QLD83/84 are copied directly from previously published material of Stewart et al. (2002, 2005). The analyses of the QLD83 and QLD83/84 datasets presented in this chapter were not performed by this author. In each instance of reproduction of previously published material, the primary source is listed.
5.3.2.1 Comparison of results from the QLD90 and QLD83 datasets.

As described earlier in this chapter, Stewart et al. (2002) subjected the QLD83 dataset to logistic regression using 11 predictor variables, namely, sex, Indigenous status, age at first substantiated incident, age at last substantiated incident, emotional abuse, neglect, physical abuse, sexual abuse, number of notifications, number of substantiated incidents, and out of home placement. The outcome variable was the presence or absence of a conviction in court prior to the age of 17 years. Due to the consistency across the utilised variables and analyses performed by this author using the QLD90 dataset and by Stewart et al. (2002) using the QLD83 dataset, the results are considered directly comparable, except those pertaining to out of home placement.

According to Stewart et al. (2002), 2,694 individuals from the QLD83 dataset were included in the final analysis, after 160 individuals from the complete dataset were excluded due to missing data for Indigenous status. According to Stewart et al. (2002), the full model with 11 predictors was superior to the constant only model \( \chi^2 (11, N = 2,694) = 394.47, p < .001 \), but the variance in offending accounted for by the model was small (Cox and Snell \( R^2 = .14 \)) with 84% classification accuracy (Stewart et al., 2002). Stewart et al.’s (2002) results table is reproduced in its entirety in this chapter as Table 5.5.
Table 5.5

Logistic regression analysis of offending status as a function of child protection notifications using the QLD83 dataset

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>Df</th>
<th>Odds Ratio</th>
<th>95% CI for odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Upper</td>
</tr>
<tr>
<td>Sex</td>
<td>1.14</td>
<td>.12</td>
<td>87.70***</td>
<td>1</td>
<td>3.13</td>
<td>2.46</td>
</tr>
<tr>
<td>Indigenous status</td>
<td>1.44</td>
<td>.13</td>
<td>114.33***</td>
<td>1</td>
<td>4.21</td>
<td>3.23</td>
</tr>
<tr>
<td>Age at first incident</td>
<td>-.01</td>
<td>.02</td>
<td>.14</td>
<td>1</td>
<td>.99</td>
<td>.94</td>
</tr>
<tr>
<td>Age at last incident</td>
<td>-.07</td>
<td>.02</td>
<td>11.69***</td>
<td>1</td>
<td>.92</td>
<td>.87</td>
</tr>
<tr>
<td>Emotional abuse</td>
<td>.07</td>
<td>.17</td>
<td>.18</td>
<td>1</td>
<td>1.07</td>
<td>.77</td>
</tr>
<tr>
<td>Neglect</td>
<td>.38</td>
<td>.17</td>
<td>4.77*</td>
<td>1</td>
<td>1.46</td>
<td>1.04</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>.53</td>
<td>.16</td>
<td>10.26***</td>
<td>1</td>
<td>1.70</td>
<td>1.23</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>-.14</td>
<td>.18</td>
<td>.61</td>
<td>1</td>
<td>.87</td>
<td>.60</td>
</tr>
<tr>
<td>Number of notifications</td>
<td>-.15</td>
<td>.04</td>
<td>13.98***</td>
<td>1</td>
<td>.86</td>
<td>.80</td>
</tr>
<tr>
<td>Out of home placement</td>
<td>.40</td>
<td>.12</td>
<td>10.51***</td>
<td>1</td>
<td>1.49</td>
<td>1.17</td>
</tr>
<tr>
<td>Number of incidents</td>
<td>.13</td>
<td>.07</td>
<td>3.15</td>
<td>1</td>
<td>1.14</td>
<td>.99</td>
</tr>
<tr>
<td>Constant</td>
<td>.34</td>
<td>.47</td>
<td>.51</td>
<td>1</td>
<td>1.40</td>
<td></td>
</tr>
</tbody>
</table>

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

Source: Stewart et al. (2002, p. 97, Table 5.24).

As shown in Stewart et al.’s (2002) results table (Table 5.5), according to the Wald criteria, of the 11 predictors, seven were shown to be significant predictors of youth offending, namely, sex, Indigenous status, out of home placement (which Stewart et al., 2002, argued was likely to be related to severity of maltreatment), age at last maltreatment incident, number of notifications, neglect, and physical abuse, with Indigenous status being the most significant predictor of offending among maltreated children. These results are remarkably similar to those obtained using the QLD90 dataset.

Consistent across both the QLD90 dataset and the QLD83 dataset, maltreated males were more likely to offend than maltreated females, maltreated Indigenous Australian young people were more likely to offend than maltreated non-Indigenous Australian young people, and neglect was associated with an increased risk of offending.
Age at last substantiated incident was also a significant predictor in both datasets. Data coding in the QLD90 dataset ensured that the positive $B$ value for this variable in Table 5.2 indicated that as age at final maltreatment event increased, so too did risk of offending. Data coding in the QLD83 dataset resulted in a negative $B$ value for this variable (Table 5.5). Importantly, Stewart et al.’s (2002) in-text interpretation was consistent with the interpretation provided for the QLD90 dataset. Stewart et al. (2002) argued that risk of offending increased alongside age at final maltreatment event. Specifically, amongst maltreated youth who offended, the average age at final maltreatment event was $M=10.6$ years ($SD = 4.0$), while for non-offending youths the average age at final maltreatment event was $M = 8.6$ years ($SD = 4.4$) (Stewart et al., 2002). Due to the use of a continuous age variable to represent timing of maltreatment, it is difficult to determine the actual impact of maltreatment occurring in specific developmental periods. These comparisons of results across the QLD90 and QLD83 cohort provide indication of the benefits of using categorical variables to examine the effects of maltreatment timing.

The variable ‘number of notifications’ was significant in both the QLD90 and QLD83 datasets, however, Stewart et al.’s (2002) results, as presented in Table 5.5, report a negative $B$ value for this variable. Again, Stewart et al.’s (2002) in-text interpretation was consistent with interpretation for the QLD90 dataset, and suggested that when ‘number of notifications’ increased, so too did risk of offending. Specifically, maltreated children in the QLD83 dataset who offended had a higher number of notifications ($M=5.5$, $SD=3.0$) than non-offending maltreated children in this dataset ($M=2.4$, $SD=2.3$) (Stewart et al., 2002).

An important difference between the QLD90 dataset and the QLD83 dataset, related to maltreatment subtypes. In particular, in the QLD83 dataset, physical abuse was a significant predictor of offending, but this variable was not significant in the QLD90 dataset. Further, there was a negative relationship between sexual abuse and offending in the QLD90 dataset, but this variable was not significant in the QLD83 dataset. Lastly, out of home placement was a significant predictor in the QLD83 dataset, but could not be included in the analyses of the QLD90 dataset. Stewart et al. (2002) hypothesised that out of home placement may reflect a greater severity of maltreatment, resulting in increased risk of offending. Clearly, though these variables cannot be examined in this thesis, the role of out of home placement and maltreatment severity in
maltreatment and offending links warrants further examination in future research. Importantly, the significance of out of home placement in the QLD83 analyses did not prevent consistency across the two datasets regarding the significance of the remaining key predictor variables, indicating the value of these results.

5.3.2.2 Comparison of results from QLD90 and QLD83/84 datasets.

As described earlier in this chapter, Stewart et al. (2005) included the same 11 predictor variables as Stewart et al. (2002), namely, sex, Indigenous status, age at first substantiated incident, age at last substantiated incident, emotional abuse, neglect, physical abuse, sexual abuse, number of notifications, out of home placement and number of substantiated incidents. Again, these predictor variables are consistent with those predictor variables from the QLD90 dataset except for the out of home placement variable. Stewart et al’s (2005) outcome variable was youth offending represented by a conviction in court or receipt of a formal police caution, while the outcome variable used for the QLD90 dataset was youth offending represented by receipt of a conviction in court only. Due to this disparity, the comparison of results from these two datasets must occur with caution.

A total of 5,464 maltreated children were included in the analyses of Stewart et al. (2005), after 285 children were excluded with missing data for Indigenous status. According to Stewart et al. (2005), the full model with 11 predictors was statistically reliable compared to the constant only model $\chi^2 (11, N = 5,464) = 727.71, p < .001$, though the variance in offending accounted for by the model was small (Cox and Snell $R^2 = .13$) with classification accuracy of only 76%. Stewart et al’s (2005) table is reproduced in this chapter as Table 5.6.
Using the Wald criterion, seven of the 11 predictor variables were shown to be significant predictors of youth offending, namely, sex, Indigenous status, age at final substantiation, number of notifications, number of substantiated maltreatment episodes, neglect, and physical abuse, where being male and Indigenous were the strongest predictors (Stewart et al., 2005). Again, the results are strikingly consistent across the cohorts. Across all three datasets, QLD83, QLD83/84 and QLD90, being male and Indigenous were the strongest predictors of youth offending. Likewise, neglect, number of notifications, and age at final substantiated event were significant predictors of offending across all three datasets.

Sexual abuse was a significant variable in the QLD90 dataset only. Importantly, the observed relationship between sexual abuse and offending in the QLD90 dataset was negative. Taken together, the results for each of the three datasets indicate that substantiated sexual abuse is not a risk factor for youth offending. Alternatively, physical abuse was a significant predictor for youth offending in both the QLD83 and QLD83/84 datasets, but this variable did not reach significance in the QLD90 dataset.
These observations indicate that additional research regarding this variable is warranted. All maltreatment types are included in both Study 2 and Study 3.

Interestingly, out of home placement did not reach significance in the QLD83/84 dataset, but was significant in the QLD83 dataset. One possibility for this inconsistency is the change in outcome variable across these datasets. In the QLD83 regression, the outcome variable related to court convictions, while in the QLD83/84 regression, the outcome variable was broader and incorporated both court convictions and formal police cautions. This inconsistent result warrants further attention in future research, unfortunately, due to a lack of data, this cannot be examined further in this thesis.

In the QLD83/84 combined dataset both 'number of substantiated events' and 'number of notifications' were significant predictors of offending. Though the B values reported in Table 5.6 indicate that 'number of notifications' was significant in the positive direction, while 'number of substantiations' was significant in the negative direction, Stewart et al’s (2005) in-text interpretation demonstrates that maltreated children in the QLD83/84 combined dataset who offended had a higher number of notifications ($M=3.4$, $SD=3.0$) and substantiations ($M=2.1$, $SD=1.8$), than non-offending maltreated children in this dataset ($M=2.3$, $SD=2.2$ and $M=1.6$, $SD=1.4$ respectively). These results provide some support for the explanation posited earlier in this chapter, that the significance of ‘number of substantiated events’ in the QLD90 and QLD83 datasets may have been obscured by the significance of ‘number of notifications’. These observations indicate the need for further investigation, and perhaps suggest that an alternative operationalisation of maltreatment frequency may be warranted in later research to determine the impact of maltreatment frequency on offending. An additional possibility is that protection efforts by the Department have had some impact here, and share an unidentified relationship with frequency of notifications and substantiations. Unfortunately, this possibility cannot be explored further in this thesis due to a lack of data.

5.3.2.3 Summary and discussion of results addressing Research Question Two.

Comparison of the results from the QLD90, QLD83 and QLD83/84 datasets revealed several consistencies. Across all three datasets, sex, Indigenous status, and neglect were significant predictors of youth offending. Likewise, the results suggest that
risk of offending typically increases as age at final substantiation increases. When these results are taken together with QLD90 results obtained using categorical variables for maltreatment timing, it appears likely that maltreatment during adolescence increases risk of offending, while maltreatment during early and middle childhood does not. These results also indicate the value of a categorical/developmental operationalisation of maltreatment timing.

Additional investigation regarding the impact of maltreatment timing on maltreatment and offending links is warranted. While the results of this study indicate a unique contribution of maltreatment timing to offending outcomes, the nature of this analysis prevents examination of overlap between maltreatment timing and the remaining maltreatment dimensions experienced across the life-course by these individuals. Maltreatment timing is a large focus in Study 2 of this thesis. The aim of Study 2 is to identify unique maltreatment trajectory groups based on the timing and frequency of maltreatment across the life-course, and examine their links with youth offending. Study 3, categorical operationalisation of maltreatment timing is utilised in exploration of the unique and shared impact of maltreatment dimensions on youth offending outcomes.

The impact of ‘number of notifications’ and ‘number of substantiations’ was challenging to ascertain due to inconsistent results across cohorts. As the three studies of this thesis utilise the same datasets, these variables are the only available measure of maltreatment frequency in this thesis. Based on policies and procedures of the Queensland child protection system, ‘number of substantiations’ is the preferred measure of maltreatment frequency in this thesis. Though, as noted by Manly (2005, p. 429) “...reports that are unsubstantiated may, nevertheless, reflect dysfunction in families who could benefit from support and therapeutic preventive programming”. At a minimum, the results presented throughout this chapter indicate the need for additional investigation of these variables in future research, with some consideration required regarding their suitability as measures of maltreatment frequency. However, this line of enquiry is not possible in this thesis. It is possible that the variation of the significance of the variables ‘number of substantiations’ and ‘number of notifications’ across the cohorts is related to the changing rates of notifications and substantiations in the child protection system indicated in Figure 4.1 of chapter four.
Relatedly, an important difference across the QLD90, QLD83 and QLD83/84 cohort datasets was the changing significance of physical abuse. In both the QLD83 and QLD83/84 cohort datasets, physical abuse was a significant predictor of offending, but physical abuse was not a significant predictor of offending in the QLD90 dataset. These results may indicate a potential impact of historical context on observed links between maltreatment type and offending in official data.

As demonstrated in the Chapter Four, rates of substantiations for each maltreatment subtype changed over time in Queensland, most likely due to changing awareness levels amongst community members and professionals. In particular, as demonstrated in Figure 4.2, across the overall population, between the cohorts, rates of substantiation for physical abuse declined. It may be possible that these variations to substantiations of maltreatment types over time are partially responsible for the changing significance of physical abuse observed across the QLD83, QLD83/4 and QLD90 regressions. Importantly, it is not possible to determine whether these recorded substantiations adequately reflect lived maltreatment experiences. If physical abuse was a unique contributor to offending, physical abuse should remain significant across cohorts despite smaller numbers of individuals being affected. This was not the case across the QLD datasets.

An alternative explanation is the presence of overlap across maltreatment dimensions, and the experience of multi-type maltreatment. Specifically, as knowledge of each maltreatment subtype increased, it is likely that decisions regarding the “most serious harm type” present in cases of multi-type maltreatment changed (Bromfield & Higgins, 2004; Bromfield & Holzer, 2008). Unfortunately, due to the nature of these administrative data, it is not possible to determine the presence of multi-type maltreatment at each substantiation, only a change in “most serious harm type” for individuals who had multiple distinct substantiation events across the life-course.

Perhaps increased awareness of the importance of maltreatment subtypes resulted in other maltreatment types being recorded as the ‘most serious harm type’ when they co-occurred with physical abuse in the QLD90 cohort. For example, Figure 4.2 indicates an increase in substantiations of emotional maltreatment alongside the decrease in substantiations of physical abuse. Though this potential relationship cannot be examined in this thesis, it may be useful if future research examined the degree of
overlap between physical abuse and emotional abuse, and substantiation decisions within the Queensland child protection system over time.

Lastly, it is possible that the impact of physical abuse on later offending is somehow associated with interactions with timing, sex and Indigenous status, and these overall patterns may have changed across cohorts. Though the impact of historical context cannot be examined in Study 3, the possibility of interactions between maltreatment type, timing, sex and Indigenous status in the QLD90 dataset receives focus in Study 3 via Conjunctive Analysis of Case Configurations (Miethe et al., 2008). These results may provide direction for future examination of the above hypothesised interactions.

Overall the observable links between maltreatment and offending remained largely consistent across cohorts, with the most important exception being the changing significance of physical abuse. Though physical abuse was a significant predictor of offending in the QLD83 and QLD83/84 cohorts, it was not a significant predictor of offending in the QLD90 cohort. While this change in significance may be attributable to the impact of historical context on observed maltreatment and offending links, for the remaining predictor variables, the impact of historical context was not apparent. In the following studies, it is necessary to further examine the potential overlap of maltreatment dimensions, and the impact of these overlaps on observed maltreatment and offending links.

5.4 Strengths and limitations of binary logistic regression

The regression results presented in this chapter were useful for investigating significant relationships between sex, Indigenous status, maltreatment dimensions and subsequent youth offending. Specifically, the results enabled identification of the unique contributions of single maltreatment dimensions, sex and Indigenous status to offending after controlling for the other maltreatment dimensions. However, it was difficult to draw conclusions regarding the underlying mechanisms of these relationships, as well as the degree of overlap between them. Overall, logistic regression was ineffective in illustrating the complex, heterogeneous nature of life-course maltreatment experiences.
The results indicate that neglect was a significant predictor of youth offending, yet little understanding has been gained in this study regarding the life-course maltreatment experiences of young people who experienced neglect. As the relationships between the numerous predictor variables are likely to be complex when examined temporally across the life-course, alternative analyses are required to assist in formulating a complex and contextualised illustration and explanation of the links between “lived” maltreatment experiences and youth offending.

There is a need to consider a potentially differential impact of particular maltreatment dimensions on males versus females, and non-Indigenous versus Indigenous young people. While the results of this study indicate that maltreated males are more likely to offend than maltreated females, and maltreated Indigenous youths are more likely to offend than maltreated non-Indigenous youths, the reasons are unclear. The impact of Indigenous status and gender on observed maltreatment and offending links is explored in particular detail in Study 3.

It is also important to note here, that for each regression model, the variance explained was limited. Simply put, this does highlight that a great deal of variance is, as yet, unexplained, providing indication of the complex nature of the relationship between maltreatment and offending, and the need for additional research, particularly using alternative analytical methods. As reported earlier in this chapter, analyses of the QLD90 dataset did reveal a substantial subset of the dataset with high residual scores, indicating that for these individuals the model did not work well. This observation indicates the need for alternative analytical strategies which more effectively account for atypical experiences of individuals, providing a greater understanding of the complexities of life-course maltreatment experiences and the links between these and youth offending. Again, this path of enquiry is enabled by Study 3.

The results of the regressions presented in this chapter indicate that some improvement to research conclusions may be achieved by performing separate logistic regressions for males compared to females, and Indigenous young people compared to non-Indigenous young people. These separate regressions may assist in highlighting potential differential impacts of maltreatment timing, type and frequency for males and females, and Indigenous young people versus non-Indigenous young people, which could not be monitored in the regressions presented in this chapter. To determine the
impact of multi-type maltreatment or chronic maltreatment on offending, alternative logistic regressions could be modelled using a variable for multi-type maltreatment (no/yes), or chronic maltreatment (no/yes). However, due to the nature of logistic regression, there would be no demonstration of the nature of overlap between dimensions.

Overall, to address the two primary research questions of this thesis: Research Question 1: Which maltreatment dimensions are related to youth offending? and Research Question 2: Do the links between maltreatment dimensions and youth offending change across cohorts?, it is necessary to extend the results obtained using logistic regression, by performing alternative analyses. Study 2 uses the semi-parametric group-based method of trajectory analysis, while Study 3 uses the conjunctive analysis of case configurations.

5.5 Conclusion and Links to Study 2

Logistic regression provided some insight into the unique contribution of maltreatment dimensions to youth offending outcomes, however, alternative operationalisation of key variables and alternative analytic approaches are warranted to develop a more comprehensive understanding of these results. The goal of using alternative analytic approaches is to better illustrate the heterogeneous nature of life-course maltreatment experiences, and the complex links between these experiences and youth offending.

The next chapter, Chapter Six, presents Study 2 of this thesis which makes use of the semi-parametric group-based method of trajectory analysis. Study 2 extends the response of this thesis to the two research questions regarding the links between maltreatment experiences and youth offending, and the potential impact of historical context on these. The datasets used in the analyses of Study 2 are the QLD90 dataset and the QLD83/84 combined dataset.
Chapter Six: Study 2: Semi-Parametric Group-Based Method of Trajectory Analysis

6.1 Chapter Overview

This chapter presents the methodology and results of Study 2 which was designed to address the two primary research questions: Research Question 1: Which maltreatment dimensions are related to youth offending? and Research Question 2: Do the links between maltreatment dimensions and youth offending change across cohorts?

The methodology of this Study was drawn from Stewart et al. (2008), who subjected the QLD83/84 combined dataset to the semi-parametric group-based method of trajectory analysis (SPGM) described by Nagin and Land (1993 cited in Stewart et al., 2008). The aim of Stewart et al.’s (2008) study was to determine the impact of timing and frequency of maltreatment on youth offending. They identified distinct maltreatment trajectory groups based on the timing and frequency of maltreatment across the life-course, and examined offending outcomes based on trajectory group membership. SPGM allows temporal, prospective, life-course consideration of the effects of maltreatment timing and frequency on youth offending.

To address Research Question One, the QLD90 dataset is subjected to the semi-parametric group-based method of trajectory analysis to determine the range of life-course maltreatment trajectories based on timing and frequency of maltreatment. These trajectories are examined to determine their links with youth offending, and the distribution of maltreatment subtypes, sex, and Indigenous status among them.

Two minor research questions were taken from Stewart et al. (2008) and incorporated into this study to guide the response to Research Question One. The minor research questions addressed by this Study are Research Question 1.1 How many distinctive child maltreatment trajectories can be identified? and, Research Question 1.2 Is there a relationship between maltreatment trajectories and youth offending?. To address Research Question Two, the results of the analyses using the QLD90 dataset are compared with the previously published, equivalent analyses of Stewart et al. (2008) using the QLD83/84 combined dataset.
Section 6.2 of this chapter presents the method of this study, including a description of the variables, data preparation and model selection process. The method section is followed by the results in section in section 6.3. As in Study 1, the two major research questions are addressed consecutively in the results section of this chapter. This chapter is concluded with a brief summary of the key findings from this study, and a discussion of its main design strengths and limitations, thereby providing the rationale and introduction for Study 3 in the next chapter.

6.2 Method

SPGM is an analytical technique designed to examine group-based development over time, within longitudinal data (Nagin, 2005). This technique differs from standard statistical approaches, as it considers the existence of subgroups in datasets rather than focussing only on individual variability (Nagin, 2005). In particular, SPGM “...allows for the possibility that there are meaningful subgroups within a population that follow distinctive developmental trajectories that are not identifiable ex ante on the basis of some measured set of individual characteristics such as gender or socioeconomic status” (Nagin 2005, p. 1). Importantly, SPGM does not rely on researchers’ assumptions of existing developmental trajectories, but rather, allows trajectories to independently emerge from the data (Nagin, 2005). In this sense, SPGM is valuable for exploratory research (Nagin, 2005). Furthermore, SPGM provides “…the capacity for linking distinctive trajectories with characteristics of individuals and their environments that might account for qualitative differences across persons in their developmental course” (Nagin, 2005, p. 2).

In sum, SPGM provides a method to explore maltreatment data to highlight existing subgroups of maltreated children, not previously recognised or predicted based on current knowledge, but distinguishable based on the timing and frequency of maltreatment events over their life-course. Additional analyses were included in this study to determine the distribution of maltreatment subtypes, sex and Indigenous status, as well as the rate of criminal offending by individuals within each identified maltreatment trajectory group.
6.2.1 Data preparation.

To ensure accuracy and integrity of results, the SPGM was performed with reference to the procedure outlined by Nagin (2005). The final analyses included 4511 individuals in the QLD90 dataset who had experienced at least one substantiated event of maltreatment. As SPGM is a SAS-based procedure, these analyses were performed using SAS version 9.3.

Consistent with the approach taken by Stewart et al. (2008), existing variables in the QLD90 dataset were re-coded to create 18 new variables, which represent the frequency of substantiated maltreatment events occurring in each year of life for each individual. Specifically, age at substantiation was calculated by comparing date of birth with date of notification for each substantiated event. Events occurring at each age were then summed, to give a total frequency of substantiated events for each year of life, thereby providing a life-course measure of maltreatment timing and frequency.

Given some missing data regarding date of birth for some cases (discussed in Chapter Four), all pre-birth substantiations were calculated together with substantiations occurring in the first year of life. This was considered an acceptable approach, as all individuals in the dataset were known to be born in 1990, and it was only the day and month of birth that remained unknown. All notifications occurring after the first birthday until the second birthday were classified as maltreatment in the second year of life, and so on. In sum, the new variables outlined above resulted in 18 data points reflecting the number of maltreatment events experienced across the life-course by each individual from pre-birth/birth to 18 years of age.

6.2.2 Model selection.

When performing SPGM, Nagin (2005) recommends a two stage model selection process described as “...the interplay of formal statistical criteria and subjective judgement...” (p. 61). The first stage of the model selection process aims to determine the appropriate number of trajectory groups, while the second stage seeks to determine the preferred order or shape of each trajectory (Nagin, 2005). Nagin (2005) argues that the choice regarding the correct number of groups is more important than identifying the correct shape or order of the groups.
To begin, Nagin’s (2005, p. 64) model selection process “...requires the estimation of models with varying numbers of groups and selection of the model with the largest BIC score”. Data from the QLD90 dataset were modelled seven times, based on the possibility of between one to seven distinct maltreatment trajectory groups. With regards to selection of the shape or order of the groups, consistent with the approach of Stewart et al. (2008), given the likelihood that maltreatment trajectories could change direction multiple times across the life-course, all trajectories in each model were modelled as cubic trajectories. This consistency with Stewart et al. (2008) also allows a more direct comparison of results across the QLD90 and QLD83/84 datasets. Also consistent with Stewart et al. (2008, p. 55), due to “...the count-based nature of the child maltreatment data being modelled and the prevalence of zeroes in the data set, it was assumed that the data were distributed according to the Zero-Inflated Poission (ZIP) distribution...”.

Once all potential models have been produced, Nagin (2005) recommends comparing Bayesian information criterion (BIC) scores for each, and selecting the “correct” model based on whichever has the largest BIC score. Table 6.1 lists the BIC scores for each of the seven models. The two BIC columns represent N based on the number of individuals (N= 4511) and the number of observations (N = 81198), which, according to Nagin (2005) respectively under and overstate the theoretically correct N, and “...bracket the theoretically correct BIC” (Nagin, 2005, p. 68).

Table 6.1

<table>
<thead>
<tr>
<th>Model</th>
<th>BIC (N= 81198)</th>
<th>BIC (N=4511)</th>
</tr>
</thead>
<tbody>
<tr>
<td>One group</td>
<td>-29554.63</td>
<td>-29547.41</td>
</tr>
<tr>
<td>Two groups</td>
<td>-29080.62</td>
<td>-29066.16</td>
</tr>
<tr>
<td>Three groups</td>
<td>-28670.52</td>
<td>-28648.84</td>
</tr>
<tr>
<td>Four groups</td>
<td>-28583.33</td>
<td>-28554.42</td>
</tr>
<tr>
<td>Five groups</td>
<td>-28502.03</td>
<td>-28465.90</td>
</tr>
<tr>
<td>Six groups</td>
<td>-28496.06</td>
<td>-28452.71</td>
</tr>
<tr>
<td>Seven groups</td>
<td>-28502.88</td>
<td>-28452.30</td>
</tr>
</tbody>
</table>
As shown in the Table 6.1, using the BIC for the number of observations (N = 81198), the BIC is largest for the six group model, but the BIC for the number of individuals (N= 4511), continues to increase. As identified by Nagin (2005), in some instances BIC scores cannot independently identify the best model. As mentioned above, in these instances model selection using BIC scores can, and should, be balanced with subjective judgement (Nagin, 2005). In these instances it is better to choose the model with the fewest groups possible, without concealing theoretically or empirically important features of the data (Nagin, 2005). Importantly, as argued by Nagin (2005, p. 77), “...there is no correct model. Statistical models are just approximations...the objective of the model selection is...to summarize the distinctive features of the data in as parsimonious a fashion as possible”.

An appropriate starting point for correct model selection in this instance is the acknowledgement that the six group model yielded the highest BIC based on number of observations. Though the BIC scores continued to improve beyond the six group model based on number of individuals, the improvement noted between the six and seven group models was smaller than the improvement noted between the five and six group models. Taken together, these figures indicate that the six group model can be considered a good choice. Likewise, given the similarity of BIC scores for the five group model and six group model, and Nagin’s (2005) observation that the BIC based on the number of observations might overstate the actual BIC, the five group model also merits additional consideration.

As demonstrated by Stewart et al. (2008), during model selection consideration can be given to the Average Posterior Probabilities of group membership (AvePP). The AvePP represents the average percentage of individuals classified to the correct trajectory group in each model. Table 6.2 reports the posterior probability of group membership for each trajectory group in all seven models, alongside the overall AvePP for each model. Nagin (2005) suggests that all groups should have an AvePP of at least 0.7.
Table 6.2

*Posterior probabilities of group membership and average posterior probability of group membership (AvePP) for each model*

<table>
<thead>
<tr>
<th>Model</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Group 4</th>
<th>Group 5</th>
<th>Group 6</th>
<th>Group 7</th>
<th>AvePP</th>
</tr>
</thead>
<tbody>
<tr>
<td>One group</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Two groups</td>
<td>0.80</td>
<td>0.87</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.84</td>
</tr>
<tr>
<td>Three groups</td>
<td>0.84</td>
<td>0.85</td>
<td>0.89</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.86</td>
</tr>
<tr>
<td>Four groups</td>
<td>0.74</td>
<td>0.81</td>
<td>0.88</td>
<td>0.82</td>
<td></td>
<td></td>
<td></td>
<td>0.81</td>
</tr>
<tr>
<td>Five groups</td>
<td>0.73</td>
<td>0.80</td>
<td>0.74</td>
<td>0.79</td>
<td>0.83</td>
<td></td>
<td></td>
<td>0.78</td>
</tr>
<tr>
<td>Six groups</td>
<td>0.72</td>
<td>0.77</td>
<td>0.78</td>
<td>0.82</td>
<td>0.66</td>
<td>0.77</td>
<td></td>
<td>0.75</td>
</tr>
<tr>
<td>Seven groups</td>
<td>0.61</td>
<td>0.72</td>
<td>0.54</td>
<td>0.79</td>
<td>0.60</td>
<td>0.58</td>
<td>0.83</td>
<td>0.67</td>
</tr>
</tbody>
</table>

As shown in Table 6.2, the seven group model failed to reach the .70 cut-off for AvePP, suggesting that the seven group model would be inappropriate for model selection. Importantly, the six group model exceeded the .70 AvePP cut-off, while the five group model showed further improvement. As mentioned above, Nagin (2005) suggests selecting a model with the fewest groups possible, without concealing theoretically or empirically important features of the data. One method of assessing the model is to visually inspect the trajectories alongside consideration of subjective knowledge of the data and theoretical frameworks.

To enable comparison of key features, the five group and six group models are presented consecutively in Figures 6.1 and 6.2 using predicted group values. As understanding of the trajectories is enhanced by examination of basic descriptive analyses, each figure is followed by a table (Tables 6.3 and 6.4, respectively) which reports means and standard deviations for age at first maltreatment episode, age at final maltreatment episode, overall frequency of maltreatment events across the life-course, and total number of maltreatment episodes experienced, for each trajectory group. These descriptive statistics and all remaining analyses presented in this chapter were performed using IBM SPSS Statistics Package Version 22.
As illustrated in Figure 6.1 and Table 6.3, in the five group model, Group one spans middle childhood, and shows a low frequency peak in maltreatment episodes late in middle childhood, prior to adolescence. Group two is restricted to adolescent
maltreatment at a low frequency. Group three is limited to early childhood maltreatment at a low frequency showing a decline prior to middle childhood. Group four begins in middle childhood and shows a high frequency peak at onset of adolescence, sharply declining across the remainder of adolescence. Lastly, Group five shows high frequency, persistent maltreatment across the life-course beginning in early childhood, peaking in frequency at middle childhood, and declining over adolescence.

Figure 6.2. Predicted maltreatment trajectories for the six group model
Table 6.4

Descriptive statistics for each of the six maltreatment trajectories

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>%</th>
<th>Age of first maltreatment</th>
<th>Age of final maltreatment</th>
<th>Frequency of life-course maltreatment</th>
<th>Total maltreatment episodes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>1</td>
<td>140</td>
<td>3.1</td>
<td>8.83</td>
<td>3.45</td>
<td>13.36</td>
<td>1.22</td>
</tr>
<tr>
<td>2</td>
<td>1787</td>
<td>39.6</td>
<td>13.32</td>
<td>2.16</td>
<td>13.96</td>
<td>1.16</td>
</tr>
<tr>
<td>3</td>
<td>99</td>
<td>2.2</td>
<td>1.16</td>
<td>1.38</td>
<td>11.59</td>
<td>2.88</td>
</tr>
<tr>
<td>4</td>
<td>1493</td>
<td>33.1</td>
<td>7.10</td>
<td>2.92</td>
<td>9.78</td>
<td>2.91</td>
</tr>
<tr>
<td>5</td>
<td>903</td>
<td>20.0</td>
<td>1.83</td>
<td>1.52</td>
<td>2.34</td>
<td>1.72</td>
</tr>
<tr>
<td>6</td>
<td>89</td>
<td>2.0</td>
<td>3.62</td>
<td>2.32</td>
<td>13.61</td>
<td>1.76</td>
</tr>
<tr>
<td>Total</td>
<td>4511</td>
<td>100</td>
<td>8.36</td>
<td>5.10</td>
<td>10.17</td>
<td>4.78</td>
</tr>
</tbody>
</table>

As illustrated by Figure 6.2 and Table 6.4, the six group model highlighted very similar features in the data when compared to the five group model. Specifically, Group one in the six group model appears to represent Group four from the five group model, Group two has remained consistent across both models, Group four in the six group model appears consistent with Group one from the five group model. In particular, direct comparison of Figures 6.1 and 6.2 as well as the descriptive statistics in Tables 6.3 and 6.4, indicates that the primary difference between the five and six group models, is that Group five from the five group model has been divided into Groups three and six in the six group model. Specifically, Group five in the five group model appeared to be a high frequency, life-course persistent maltreatment group. In the six group model, this group has been further delineated into two separate life-course persistent maltreatment groups (Groups three and six), where Group three includes individuals with high frequency maltreatment beginning in very early childhood and continuing until the transition to adolescence, with a peak in maltreatment frequency at around five years of age, and Group six includes individuals with high frequency maltreatment beginning in early childhood and continuing in adolescence with a peak in maltreatment frequency at around 12 years of age.

Taking into account the above observations regarding BIC scores and AvePP scores, alongside visual inspection of the models and subjective judgement, the six group model was selected as the “correct” model. While it is acknowledged here that the additional group in the six group model did slightly reduce the AvePP, selection of
the five group model would have concealed theoretically and empirically important features of the data. In particular, selection of the five group model would have prevented examination of the impact of maltreatment peaks at the early to middle childhood transition point, compared to the middle childhood to adolescence transition point, as enabled by Groups three and six in the six group model.

6.3 Results

This results section is separated into two main parts. Section 6.3.1 provides a response to Research Question One: Which maltreatment dimensions are related to youth offending? First, section 6.3.1.1 provides a response to Research Question 1.1: How many distinctive child maltreatment trajectories can be identified?. Included in section 6.3.1 is a description of the distinct maltreatment trajectories, as well as descriptive data presenting the distribution of sex, Indigenous status, and maltreatment types across these trajectory groups. Next, section 6.3.1.2 provides a response to Research Question 1.2: Is there a relationship between maltreatment trajectories and youth offending? The rates of offending for individuals in each maltreatment trajectory group are included in Section 6.3.2, alongside reflection of the impact of maltreatment frequency, type, timing and distribution of gender and Indigenous status on offending by these groups.

Section 6.3.2 provides a response to Research Question Two: Do the links between maltreatment dimensions and youth offending change across time? In section 6.3.2 the results of the QLD90 SPGM analyses are compared to Stewart et al.’s. (2008) previously published QLD83/84 SPGM analyses.

6.3.1 Research Question One: Which maltreatment dimensions are related to youth offending?

6.3.1.1 Research Question 1.1: How many distinctive child maltreatment trajectories can be identified?

Within the QLD90 dataset, based on the timing and frequency of maltreatment across the life-course, six distinct trajectories of childhood maltreatment were identified. These six trajectories are depicted in Figure 6.3 using predicted group values. To assist
with analysis and interpretation, a group name was devised for each trajectory group following visual inspection of the graph, and examination of the characteristics of each trajectory group. These group labels are included in Figure 6.3.

![Figure 6.3. Maltreatment trajectories for the six group model.](image)

To reiterate, Group 1, named the ‘Adolescent Peak – Chronic Victimisation’ (AP-CV) group, experienced maltreatment beginning in middle childhood and ending in adolescence with a high frequency of maltreatment across the life-course, peaking in adolescence. In this instance, ‘chronic’ refers to the fact that the maltreatment extended across two developmental periods. Group 2, named ‘Adolescent Limited – Low Victimisation’ (AL-LV), experienced a low frequency of maltreatment restricted to adolescence. Group 3, named ‘Primary School Transition – Chronic Victimisation’ (PST-CV), experienced a high frequency of maltreatment across the life-course which
began in very early childhood and ended at the transition to adolescence, with a peak in maltreatment frequency shortly before the transition from early childhood to middle childhood. This group name was selected because the transition point from early to middle childhood often coincides with the transition to primary school education in Queensland. Group 4, named ‘Middle Childhood Limited – Low Victimisation’ (MCL-LV), experienced a low frequency of maltreatment restricted to middle childhood. Group 5, named ‘Early Childhood Limited – Low Victimisation’ (ECL-LV), experienced a low frequency of maltreatment restricted to early childhood. Lastly, Group 6, named ‘Secondary School Transition – Chronic Victimisation’ (SST-CV), experienced a high frequency of maltreatment spanning from early childhood to adolescence, with a peak in maltreatment frequency at the transition from middle childhood to adolescence, which also coincides with the transition to secondary school in Queensland.

As demonstrated in Table 6.4, the trajectory group with the highest frequency of maltreatment events over the life-course was Group 6 (SST-CV), followed by Groups 3 (PST-CV) and 1 (AP-CV). There appears to be overlap between chronicity and frequency of maltreatment, as the three chronic groups also had the highest frequency of maltreatment over the life-course.

The majority of children (72.7%) were assigned to Groups 2 (AL-LV) and 4 (MCL-LV), with an additional 20% assigned to Group 5 (ECL-LV). Each of these three trajectory groups are low frequency groups. To enhance understanding of the characteristics of young people in each trajectory group, Table 6.6 reports the distribution of sex and Indigenous status for each trajectory group in the six group model.
Table 6.6

*Maltreatment trajectory groups by sex and Indigenous status*

<table>
<thead>
<tr>
<th>Trajectory</th>
<th>N</th>
<th>% Male</th>
<th>% Female</th>
<th>% Indigenous</th>
<th>% Non-Indigenous</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 AP-CV</td>
<td>140</td>
<td>46.4</td>
<td>53.6</td>
<td>28.6</td>
<td>71.4</td>
</tr>
<tr>
<td>2 AL-LV</td>
<td>1787</td>
<td>38.4</td>
<td>61.6</td>
<td>12.0</td>
<td>88.0</td>
</tr>
<tr>
<td>3 PST-CV</td>
<td>99</td>
<td>57.6</td>
<td>42.4</td>
<td>33.3</td>
<td>66.7</td>
</tr>
<tr>
<td>4 MCL-LV</td>
<td>1493</td>
<td>51.4</td>
<td>48.6</td>
<td>14.1</td>
<td>85.9</td>
</tr>
<tr>
<td>5 ECL-LV</td>
<td>903</td>
<td>51.1</td>
<td>48.9</td>
<td>16.6</td>
<td>83.4</td>
</tr>
<tr>
<td>6 SST-CV</td>
<td>89</td>
<td>47.2</td>
<td>52.8</td>
<td>32.6</td>
<td>67.4</td>
</tr>
<tr>
<td>Total</td>
<td>4511</td>
<td>46.1</td>
<td>53.9</td>
<td>15.0</td>
<td>84.0</td>
</tr>
</tbody>
</table>

The figures presented in Table 6.6 indicate that Indigenous Australian young people were overrepresented in the overall cohort of maltreatment children and every trajectory group. According to the Australian Bureau of Statistics (2014), Indigenous Australians represent approximately 3% of the overall Australian population, and a slightly higher percentage of individuals under the age of 18 years. The distribution of Indigenous Australian young people across the six trajectory groups differed significantly, $\chi^2 (5, N=4511) = 83.41, p<.001$, Cramer’s $V = .14$. Indigenous Australian young people were especially overrepresented in Groups 1 (AP-CV), 3 (PST-CV) and 6 (SST-CV). These trajectory groups were all characterised by ‘chronic’ and high frequency maltreatment. Overrepresentation of Indigenous young people was highest in Group 3 (PST-CV), followed by Groups 6 (SST-CV) and 1 (AP-CV). Interestingly, these are the smallest trajectory groups, because, as discussed above, the majority of children were assigned to Groups 2 (AL-LV), 4 (MCL-LV) and 5 (ECL-LV). This observation requires additional examination in order to determine the impact of Indigenous status compared to maltreatment chronicity and frequency.

Sex distribution varied across the trajectory groups $\chi^2 (5, N=4511) = 73.07, p<.001$, Cramer’s $V = .13$. Females were slightly overrepresented in the overall sample of maltreated children, but were particularly overrepresented in Group 2 (AL-LV), while males were particularly overrepresented in Group 3 (PST-CV).

In order to demonstrate the complex associations between maltreatment timing, frequency and subtype, Table 6.7 reports the percentage of individuals in each trajectory group who experienced each distinct maltreatment type. When totalled, these figures...
exceed 100%, because young people often experienced more than one type of maltreatment over the life-course. To further illustrate this observation, Table 6.7 also reports the percentage of individuals in each trajectory group who experienced multiple maltreatment types over the life-course.

Table 6.7

<table>
<thead>
<tr>
<th>Trajectory</th>
<th>N children</th>
<th>Emotional abuse (%)</th>
<th>Physical abuse (%)</th>
<th>Sexual abuse (%)</th>
<th>Neglect (%)</th>
<th>Multi-type types (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP-CV</td>
<td>140</td>
<td>67.1</td>
<td>60.7</td>
<td>20.7</td>
<td>75.7</td>
<td>78.6</td>
</tr>
<tr>
<td>AL-LV</td>
<td>1787</td>
<td>37.8</td>
<td>37.8</td>
<td>13.5</td>
<td>31.8</td>
<td>18.7</td>
</tr>
<tr>
<td>PST-CV</td>
<td>99</td>
<td>65.7</td>
<td>76.8</td>
<td>25.3</td>
<td>89.9</td>
<td>90.9</td>
</tr>
<tr>
<td>MCL-LV</td>
<td>1493</td>
<td>37.1</td>
<td>40.8</td>
<td>14.1</td>
<td>46.7</td>
<td>31.6</td>
</tr>
<tr>
<td>ECL-LV</td>
<td>903</td>
<td>21.6</td>
<td>36.3</td>
<td>9.4</td>
<td>49.7</td>
<td>15.6</td>
</tr>
<tr>
<td>SST-CV</td>
<td>89</td>
<td>68.5</td>
<td>76.4</td>
<td>30.3</td>
<td>89.9</td>
<td>94.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4511</strong></td>
<td><strong>36.4</strong></td>
<td><strong>40.8</strong></td>
<td><strong>13.7</strong></td>
<td><strong>44.1</strong></td>
<td><strong>27.3</strong></td>
</tr>
</tbody>
</table>

The figures presented in Table 6.7 provide some indication of the complex nature of maltreatment experiences across the life-course. In particular, within the overall cohort of maltreated children, 27.3% of young people experienced more than one type of maltreatment over the life-course. The percentage of individuals who experienced multi-type maltreatment types varied widely across trajectory groups, $\chi^2 (5, N=4511) = 730.87, p<.001$, Cramer’s $V = .40$. In particular, in Groups 2 (AL-LV), 4 (MCL-LV), and 5 (ECL-LV), the majority of young people experienced a single maltreatment type over the life-course. Alternatively, in Groups 1 (AP-CV), 3 (PST-CV), and 6 (SST-CV), the vast majority experienced multi-type maltreatment types. The highest percentage of individuals experiencing multi-type maltreatment types was evident in Group 6 (SST-CV), followed by Groups 3 (PST-CV) and 1 (AP-CV). Interestingly, the groups in which the majority of young people experienced multi-type maltreatment types were also the ‘chronic’ maltreatment and high frequency groups, and the groups with the greatest overrepresentation of Indigenous Australian young people. The above results indicate potential interplay between maltreatment frequency,
chronicity and the experience of multiple maltreatment types, indicating the need for caution when interpreting results relating to these maltreatment dimensions.

Across the entire cohort, the most commonly experienced maltreatment subtype was neglect, followed by physical abuse, emotional abuse and sexual abuse, respectively. Comparing the distribution of maltreatment types for the whole cohort with the distribution of maltreatment types within each trajectory group, it appears Groups 1 (AP-CV), 3 (PST-CV), and 6 (SST-CV) had higher percentages of individuals experiencing every maltreatment type, with the majority of individuals in each of these groups experiencing neglect, physical abuse and emotional abuse, and a higher than average percentage of individuals experiencing sexual abuse. In Group 2 (AL-LV), emotional abuse was experienced by a higher percentage compared to the overall cohort, while the remaining maltreatment types were experienced at similar or lower rates. In Group 4 (MCL-LV), emotional abuse, sexual abuse and neglect were experienced by a higher percentage than in the overall cohort, while physical abuse was consistent with the overall cohort. Lastly, a higher percentage of individuals in Group 5 (ECL-LV) experienced neglect, compared to the overall population, but a lower percentage of individuals experienced the remaining maltreatment types.

6.3.1.2 Research Question 1.2: Is there a relationship between maltreatment trajectories and youth offending?

To address Research Question 1.2 post-hoc analyses were performed on the six trajectory groups identified by the model. From the original 4,511 individuals, 4,478 individuals were included in these analyses after 33 were excluded due to their first recorded conviction preceding their first maltreatment event. The variable of interest here is consistent with the outcome variable from Study 1, and represents whether the individual ever received a conviction as a youth (no/yes). The percentage of individuals receiving a conviction in each trajectory group is recorded in Table 6.8. This figure provides an indication of whether certain maltreatment trajectory groups shared a stronger link with youth offending than others.
Table 6.8

Percentage of individuals in each trajectory group who offended

<table>
<thead>
<tr>
<th>Trajectory</th>
<th>N</th>
<th>% Offended</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AP-CV</td>
<td>139</td>
</tr>
<tr>
<td>2</td>
<td>AL-LV</td>
<td>1755</td>
</tr>
<tr>
<td>3</td>
<td>PST-CV</td>
<td>99</td>
</tr>
<tr>
<td>4</td>
<td>MCL-LV</td>
<td>1493</td>
</tr>
<tr>
<td>5</td>
<td>ECL-LV</td>
<td>903</td>
</tr>
<tr>
<td>6</td>
<td>SST-CV</td>
<td>89</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4478</td>
</tr>
</tbody>
</table>

As shown in Table 6.8, the percentage of individuals in each trajectory group who subsequently received a conviction varied widely. Across the overall cohort, 15.7% of maltreated young people subsequently received a conviction for youth offending. However, across trajectory groups, the percentage of maltreated young people who subsequently received a conviction ranged from 8.9% to 45.3%. The trajectory group with the highest percentage of offenders was Group 1 (AP-CV), followed by Group 6 (SST-CV) and Group 3 (PST-CV).

6.3.1.3 Research Question One: Which maltreatment dimensions are related to youth offending?

In order to better understand the differential relationship between each trajectory group and offending, it is important to reflect upon the variations between these groups with regards to distribution of maltreatment timing, frequency, and subtype, as well as Indigenous status. This reflection assists in providing a response to Research Question One: Which maltreatment dimensions are related to youth offending?

Table 6.9 ranks the six trajectory groups from highest to lowest (1 = highest, 6 = lowest) in relation to the percentage of individuals who engaged in offending, the frequency of maltreatment events over the life-course, the percentage of individuals experiencing multiple maltreatment types, and the overrepresentation of Indigenous young people. In addition, the developmental period in which each group experienced a peak in maltreatment
frequency is recorded. For each column, the three highest scoring trajectory groups are highlighted in bold.

Table 6.9

The six trajectory groups in the QLD90 dataset ranked from highest (1) to lowest (6) according to offending, maltreatment frequency, multiple maltreatment, and over-representation of Indigenous young people.

<table>
<thead>
<tr>
<th>Trajectory</th>
<th>Offending (%)</th>
<th>Maltreatment frequency (M)</th>
<th>Multiple maltreatment types (%)</th>
<th>Overrepresentation of Indigenous young people (%)</th>
<th>Maltreatment peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. AP-CV</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>Adolescence</td>
</tr>
<tr>
<td>2. AL-LV</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>Adolescence</td>
</tr>
<tr>
<td>3. PST-CV</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>Transition</td>
</tr>
<tr>
<td>4. MCL-LV</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>Middle</td>
</tr>
<tr>
<td>5. ECL-LV</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>Early</td>
</tr>
<tr>
<td>6. SST-CV</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>Transition</td>
</tr>
</tbody>
</table>

The figures in Table 6.9 indicate that the percentage of individuals who offended was higher in trajectory groups classified as ‘chronic victimisation’ than trajectory groups classified as ‘low victimisation’. However, due to the fact that the chronic groups were also high frequency groups, with high rates of multiple maltreatment types, and overrepresentation of Indigenous Australian young people, it is difficult to isolate the unique impact of each distinct maltreatment dimension.

As shown in Table 6.9, amongst the “chronic victimisation” groups, Group 1 (AP-CV) had the highest percentage of offenders, followed by Group 6 (SST-CV) and Group 3 (PST-CV), despite the fact that, Group 6 (SST-CV) had the highest frequency of maltreatment over the life-course, followed by Group 3 (PST-CV) and Group 1 (AP-CV). This result could indicate a lesser impact of frequency compared to chronicity, however, notably, Groups 1 (AP-CV) and 6 (SST-CV) each experienced a peak in maltreatment frequency at adolescence, while Group 3 (PST-CV) experienced their peak in maltreatment frequency in early childhood. Similarly, amongst the “low victimisation” groups the percentage of individuals who offended was highest for Group 2 (AL-LV), followed by
Groups 4 (MCL-LV) and 5 (ECL-LV). Amongst these groups, the highest frequency of maltreatment was evident for Group 4 (MCL-LV), followed by Groups 2 (AL-LV) and 5 (ECL-LV). Consistent with the above observation, Group 2 (AL-LV) experienced a peak in maltreatment frequency during adolescence, compared to Groups 4 (MCL-LV) and 5 (ECL-LV) who experienced a peak in maltreatment frequency in middle and early childhood, respectively. This may indicate the impact of timing of maltreatment, and in particular, an increased percentage of young people offending when a peak in maltreatment occurs during adolescence. The impact of maltreatment timing on observed maltreatment and offending links is examined further in Study 3.

In addition to the above observations regarding maltreatment timing, it should be noted here that two of the groups with the highest percentage of offending, also experienced a peak in maltreatment at a transition point. Specifically, Group 3 (PST-CV) experienced a peak in maltreatment close to the transition from early to middle childhood, while Group 6 (SST-CV) experienced a peak in maltreatment frequency close to the transition from middle childhood to adolescence. These two transition groups had the highest frequency of maltreatment across the life-course compared to the remaining trajectory groups.

The above observations regarding the results of this study suggest that all three variables, frequency, chronicity, and timing of maltreatment affect the link between maltreatment and youth offending. The impact of distribution of sex amongst these trajectories was, seemingly, less meaningful, though males were particularly overrepresented in Group 3 (PST-CV) (high rate of offending), while females were particularly overrepresented in Group 2 (AL-LV) (low rate of offending). These results may indicate the need to further examine the potential impact of sex distribution on rates of offending within these groups, compared to other maltreatment dimensions. Furthermore, Indigenous Australian young people were most overrepresented in the chronic, high frequency trajectory groups with multiple maltreatment types, suggesting the need for additional research regarding the experience of maltreatment and youth offending amongst Indigenous Australian young people compared to non-Indigenous young people. Potential variations in maltreatment and offending links for males compared to females, and Indigenous youths compared to non-Indigenous youths, is a particular focus of Study 3.
Lastly, the impact of single maltreatment types was difficult to determine. This is because the experience of multiple maltreatment types was common. Amongst the trajectory groups with the highest percentage of young people engaging in crime, the majority of young people experienced multiple maltreatment types, and in particular, the majority of young people in these three trajectory groups experienced three maltreatment subtypes over the life-course (physical abuse, neglect and emotional abuse), and a higher percentage experienced sexual abuse compared to the average percentage for the overall cohort. These results highlight the importance of considering the experience of multiple maltreatment types in research regarding the links between maltreatment and offending. The impact of the experience of multiple maltreatment types, alongside examinations of the unique impact of each distinct maltreatment subtype, warrants further investigation. This is a particular focus in Study 3.

As a final note, it may be beneficial to consider here, that trajectories which indicate that maltreatment ceased prior to adolescence, may, in reality, reflect an alternative turning point such as removal from the parents through child protection intervention or incarceration, relocation of the family outside of Queensland jurisdiction, or perhaps the affected young person running away from home. Though these possibilities cannot be further examined in this thesis using the currently available data, the work of future researchers may benefit from additional investigation of these possibilities.

6.3.1.4 Summary and discussion of results addressing Research Question One.

When the QLD90 dataset was subjected to SPGM, six distinct life-course maltreatment trajectories were identified based on the timing and frequency of maltreatment over the life-course. Analyses intended to identify the links between these maltreatment trajectories and youth offending indicate that the timing, frequency and chronicity of maltreatment may affect the relationship between maltreatment and offending. However, the unique contribution of each of these dimensions is difficult to ascertain due to the apparent overlap of these dimensions in particular trajectories. Specifically, trajectory groups with the highest percentage of individuals who went on to offend, appeared to simultaneously experience a high frequency of maltreatment across the life-course, chronic maltreatment (meaning maltreatment in multiple developmental periods), and multiple maltreatment types.
Additionally, Indigenous Australian young people were most overrepresented in these groups.

These apparent overlaps in the experience of several maltreatment dimensions limit interpretation of the unique contribution of these dimensions in this study, and also highlight the need for more consistent simultaneous consideration of these dimensions in future research, rather than treating these as separate and distinct. This approach is explored in Study 3 (Chapter Seven) through conjunctive analysis of case configurations. Lastly, a peak in maltreatment at transition points appeared to be related to offending, as did a peak in maltreatment during, or close to, adolescence. These results, and their implications, are discussed further at the conclusion of this chapter.

6.3.2 Research Question Two: Do the links between maltreatment dimensions and youth offending change across cohorts?

The results of the QLD90 SPGM are compared here to the previously published results of the QLD83/84 dataset. To be clear, the data and tables presented in this section pertaining to the QLD83/84 dataset are copied directly from a previously published article by Stewart et al. (2008), with the exception of Table 6.14. The analyses of the QLD83/84 dataset presented in this chapter were not performed by this author. In each instance of reproduction of previously published material, the primary source is listed.

According to Stewart et al. (2008), 5849 individuals from the QLD83/84 dataset were included in the SPGM, after 176 individuals were excluded due to their first conviction or caution preceding their first maltreatment event. The outcome variable of interest in Stewart et al’s (2008) analyses was whether the young person ever received a formal police caution or court conviction (no/yes). This is a variation to the outcome variable used in analyses of the QLD90 dataset, which represented convictions in court only. This variation in outcome variable necessitates caution in interpretation of results pertaining to rates of offending.

Another variation between the QLD90 dataset and the QLD83/84 dataset is the number of data points included in the trajectory analysis. According to Stewart et al. (2008) there were 16 data points, suggesting that 16 was the oldest age at which a young person in the QLD83/84 dataset had contact with the department for a child protection matter. In the
QLD90 dataset there were 18 data points available, as young people could have contact with the Department until the day prior to their 18th birthday.

6.3.2.1 Research Question 1.1: How many distinctive child maltreatment trajectories can be identified?

As stated earlier in this chapter, the QLD83/84 dataset was subjected to SPGM using the ZIP model and cubic trajectories (Stewart et al., 2008). Stewart et al. (2008) selected a six group model over a seven group model. Though the seven group model showed the highest BIC, the AvePP was higher for the six group model (Stewart et al., 2008). These six maltreatment trajectories are presented in Figure 6.4 (sourced directly from Figure one of Stewart et al. 2008, p. 57), followed by descriptive statistics for each in Table 6.10 (sourced directly from Table 1 of Stewart et al., 2008, p. 58).
Figure 6.4. Maltreatment trajectories for the six group model (QLD83/84).

Table 6.10

Descriptive statistics for each of the six maltreatment trajectories.

<table>
<thead>
<tr>
<th>Trajectory</th>
<th>N</th>
<th>%</th>
<th>Age of first Maltreatment</th>
<th>Age of final Maltreatment</th>
<th>Frequency of Maltreatment</th>
<th>Total maltreatment episodes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>1</td>
<td>ECL-AV</td>
<td>658</td>
<td>11.3</td>
<td>1.95</td>
<td>1.15</td>
<td>2.50</td>
</tr>
<tr>
<td>2</td>
<td>PST-CV</td>
<td>223</td>
<td>3.8</td>
<td>3.19</td>
<td>1.93</td>
<td>9.95</td>
</tr>
<tr>
<td>3</td>
<td>PST-LV</td>
<td>2,774</td>
<td>47.4</td>
<td>5.65</td>
<td>2.54</td>
<td>6.71</td>
</tr>
<tr>
<td>4</td>
<td>SST-CV</td>
<td>259</td>
<td>4.4</td>
<td>5.87</td>
<td>3.66</td>
<td>12.84</td>
</tr>
<tr>
<td>5</td>
<td>SST-LV</td>
<td>1,255</td>
<td>21.5</td>
<td>11.22</td>
<td>2.30</td>
<td>12.11</td>
</tr>
<tr>
<td>6</td>
<td>AL-AV</td>
<td>680</td>
<td>11.6</td>
<td>15.06</td>
<td>1.16</td>
<td>15.23</td>
</tr>
<tr>
<td>Total</td>
<td>5,849</td>
<td>100</td>
<td>7.44</td>
<td>4.55</td>
<td>8.78</td>
<td>4.56</td>
</tr>
</tbody>
</table>


As demonstrated in Figure 6.4 and Table 6.10, Group 1, the Early Childhood Limited – Acute Victimisation (ECL-AV) group, was an early childhood limited trajectory with a low frequency of maltreatment. This trajectory is consistent with Group 5 identified in the QLD90 dataset, termed the Early Childhood Limited – Low Victimisation (ECL-LV). Group 2, the Primary School Transition – Chronic Victimisation (PST-CV) group, spans from early to middle childhood, with a high frequency of maltreatment peaking at the transition point between these two developmental periods. This trajectory is largely consistent with Group 3 in the QLD90 dataset, also named the Primary School Transition – Chronic Victimisation Group (PST-CV). Group 3, named the Primary School Transition – Low Victimisation (PST-LV) group, begins and peaks at the transition between early and middle childhood, with a low frequency. This trajectory group is similar to trajectory Group 4 in the QLD90 dataset, named the Middle Childhood Limited – Low Victimisation (MCL-LV) with regards to frequency of maltreatment and occurrence of maltreatment in middle childhood, however this trajectory in the QLD90 dataset had a later onset, moving its peak away from the early to middle childhood transition point. Group 4, the Secondary School Transition – Chronic Victimisation (SST-CV) group, spanned from middle childhood to adolescence with a relatively high frequency of maltreatment peaking at the transition from middle childhood to
adolescence. This trajectory is largely consistent with trajectory Group 6 in the QLD90 dataset, also named the Secondary School Transition – Chronic Victimisation (SST-CV) group. Group 5, named the Secondary School Transition – Low Victimisation (SST-LV) group, spanned tightly from either side of the transition between middle childhood and adolescence, with a low frequency of maltreatment. This trajectory group could be compared to Group 1 in the QLD90 dataset, named Adolescent Peak – Chronic Victimisation (AP-CV), except that group one had a slightly earlier middle childhood onset of maltreatment, and a high frequency of maltreatment. Alternatively, Group 5 could also be compared to Group 4 in the QLD90 dataset, the Middle Childhood Limited – Low Victimisation (MCL-LV) with regards to frequency of maltreatment and occurrence of maltreatment in middle childhood, however maltreatment substantiations in this trajectory in the QLD90 dataset began and ceased earlier, moving its peak away from the middle childhood to adolescence transition point. Lastly, Group 6, named Adolescent Limited – Acute Victimisation (AL-AV), was restricted to adolescent maltreatment, with a low frequency of maltreatment. This group is consistent with Group 2 in the QLD90 dataset, similarly named Adolescence Limited – Low Victimisation (AL-LV).

As discussed by Stewart et al. (2008), the majority of children in the QLD83/84 dataset were assigned to Groups 3 (PST-LV) and 5 (SST-LV), which were both low victimisation trajectories. This is consistent with the observed distribution of Individuals in the QLD90 dataset, whereby the majority were assigned to low frequency trajectories. Consistent with observations of the QLD90 dataset, the chronic maltreatment groups were also high frequency groups.

It is important to note here, that Stewart et al. (2008) reported an increase in the rate of maltreatment notifications over the life-course of the QLD83/84 dataset, and noted that this increase was possibly due to changes to community awareness and attitudes, and/or change to Departmental policies and procedures. This observation is consistent with observations made in Chapter Four of this thesis. It is important to remember this observation when interpreting results regarding the impact of maltreatment timing on rates of offending. Table 6.11, sourced from Table 2 from Stewart et al. (2008, p. 59), reports the distribution of sex and Indigenous status across each of the six trajectory groups.
Table 6.11

Maltreatment trajectory groups by sex and Indigenous status.

<table>
<thead>
<tr>
<th>Trajectory group</th>
<th>N</th>
<th>%Male</th>
<th>%Female</th>
<th>%Indigenous</th>
<th>%Non-Indigenous</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ECL-AV</td>
<td>658</td>
<td>53.8</td>
<td>46.2</td>
<td>11.6</td>
<td>88.4</td>
</tr>
<tr>
<td>2 PST-CV</td>
<td>223</td>
<td>49.8</td>
<td>50.2</td>
<td>16.6</td>
<td>83.4</td>
</tr>
<tr>
<td>3 PST-LV</td>
<td>2,774</td>
<td>47.4</td>
<td>52.6</td>
<td>12.8</td>
<td>87.2</td>
</tr>
<tr>
<td>4 SST-CV</td>
<td>259</td>
<td>48.0</td>
<td>52.0</td>
<td>25.7</td>
<td>74.3</td>
</tr>
<tr>
<td>5 SST-LV</td>
<td>1,255</td>
<td>45.9</td>
<td>54.1</td>
<td>16.8</td>
<td>83.2</td>
</tr>
<tr>
<td>6 AL-AV</td>
<td>680</td>
<td>33.8</td>
<td>66.2</td>
<td>6.9</td>
<td>93.1</td>
</tr>
<tr>
<td>Total</td>
<td>5,849</td>
<td>46.7</td>
<td>53.3</td>
<td>13.5</td>
<td>86.5</td>
</tr>
</tbody>
</table>


As argued by Stewart et al. (2008) and shown in Table 6.11, Indigenous Australian young people were overrepresented in all trajectory groups, but were particularly overrepresented in trajectory Groups 4 (SST-CV) and 5 (SST-LV), representing one chronic group and one low victimisation group. This is a variation to the results from the QLD90 dataset, in which overrepresentation of Indigenous Australian young people was highest, in the three trajectory chronic groups with the highest frequency of maltreatment. Females were overrepresented in the overall sample of QLD83/84 maltreated children, however, females were particularly overrepresented in Group 6 (AL-LV), while males were overrepresented in Group 1 (ECL-AV).

Table 6.12 was sourced from Stewart et al. (2008, p. 60), and reports the most serious harm type identified across maltreatment episodes for each maltreatment trajectory group. This method of examination of these variables differs from the approach used with the QLD90 dataset. Stewart et al. (2008) provided no indication of the experience of multiple maltreatment subtypes across the life-course. Rather, these authors make reference to “...the
most serious type of maltreatment” (Stewart et al., 2008, p. 59) reported by child protection workers at the time of investigation. The figures reported for each maltreatment subtype, when summed, equal 100% for each trajectory group, suggesting some method of classification to determine the most serious harm type experienced across the life-course, regardless of multiple maltreatment types likely being experienced by some individuals in each trajectory group. The exact method of classification, however, was not reported by Stewart et al. (2008), meaning this table could not be replicated in the QLD90 dataset. This also restricts comparability of these results with regards to distinct maltreatment subtypes.

Table 6.12

<table>
<thead>
<tr>
<th>Maltreatment Type</th>
<th>n children</th>
<th>n episodes</th>
<th>Emotional abuse (%)</th>
<th>Physical abuse (%)</th>
<th>Sexual abuse (%)</th>
<th>Neglect (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ECL-AV</td>
<td>658</td>
<td>1071</td>
<td>15.3</td>
<td>26.9</td>
<td>5.8</td>
<td>52.0</td>
</tr>
<tr>
<td>2 PST-CV</td>
<td>223</td>
<td>1180</td>
<td>16.7</td>
<td>27.5</td>
<td>8.8</td>
<td>47.0</td>
</tr>
<tr>
<td>3 PST-LV</td>
<td>2,774</td>
<td>3941</td>
<td>16.2</td>
<td>27.2</td>
<td>20.9</td>
<td>35.7</td>
</tr>
<tr>
<td>4 SST-CV</td>
<td>259</td>
<td>1266</td>
<td>19.2</td>
<td>32.9</td>
<td>9.4</td>
<td>38.5</td>
</tr>
<tr>
<td>5 SST-LV</td>
<td>1,255</td>
<td>1882</td>
<td>22.8</td>
<td>37.1</td>
<td>13.9</td>
<td>26.1</td>
</tr>
<tr>
<td>6 AL-AV</td>
<td>680</td>
<td>850</td>
<td>26.4</td>
<td>36.2</td>
<td>12.5</td>
<td>24.9</td>
</tr>
</tbody>
</table>

Source: Stewart et al. (2008, p. 60, Table 3). Reprinted from Child Abuse and Neglect, 32, Stewart, A., Livingston, M. & Dennison, S. Transitions and turning points: Examining the links between child maltreatment and juvenile offending, pp.51-66., Copyright (2008), with permission from Elsevier.

As shown in Table 6.12, overall, the most commonly identified maltreatment subtype was neglect, followed by physical abuse, emotional abuse, and sexual abuse, respectively. This overall pattern is consistent with the overall pattern identified in the QLD90 dataset. Interestingly though, only 18.6% of individuals experienced emotional abuse in the QLD83/84 dataset, while 36.4% of individuals in the QLD90 dataset experienced emotional abuse. This result is consistent with observations in Chapter Four, which highlighted the relative increase in substantiations of emotional abuse compared to the other maltreatment
types over time in Queensland. These results assist in highlighting the potential impact of historical context on maltreatment data and research conclusions.

As argued by Stewart et al. (2008), when the trajectory groups were compared, the children in Group 1 (ECL-AV) were most likely to be reported for neglect, the children in Groups 5 (SST-LV) and 6 (AL-AV) were more likely to be physically and emotionally abused, and the children in Group 3 (PST-LV) were more likely to be sexually abused. These observations cannot be directly compared to observations for the QLD90 dataset, due to the aforementioned variation in data classification, and the identified presence of multiple maltreatment types in the QLD90 dataset.

6.3.2.2 Research Question 1.2: Is there a relationship between maltreatment trajectories and youth offending?

In the QLD90 dataset, youth offending was represented by a conviction in court (no/yes). In the QLD83/84 dataset, youth offending is represented by either receipt of a formal police caution or a conviction in court (no/yes). Consequently, the results from the QLD90 dataset are not directly comparable with those of the QLD83/84 dataset regarding the links between maltreatment trajectories and youth offending.

Table 6.13 was sourced directly from Table 4 in Stewart et al. (2008, p. 60), and presents the percentage of individuals in each trajectory group who offended as a youth.
Table 6.13

Percentage of maltreated children who offend as a juvenile by maltreatment trajectory.

<table>
<thead>
<tr>
<th>Group</th>
<th>Trajectory</th>
<th>N</th>
<th>% Offended</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ECL-AV</td>
<td>658</td>
<td>16.7</td>
</tr>
<tr>
<td>2</td>
<td>PST-CV</td>
<td>223</td>
<td>36.3</td>
</tr>
<tr>
<td>3</td>
<td>PST-LV</td>
<td>2,774</td>
<td>20.8</td>
</tr>
<tr>
<td>4</td>
<td>SST-CV</td>
<td>259</td>
<td>51.4</td>
</tr>
<tr>
<td>5</td>
<td>SST-LV</td>
<td>1,255</td>
<td>34.8</td>
</tr>
<tr>
<td>6</td>
<td>AL-AV</td>
<td>680</td>
<td>35.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>5,849</td>
<td>27.0</td>
</tr>
</tbody>
</table>

Source: Stewart et al. (2008, p. 60, Table 4). Reprinted from Child Abuse and Neglect, 32, Stewart, A., Livingston, M. & Dennison, S. Transitions and turning points: Examining the links between child maltreatment and juvenile offending, pp.51-66., Copyright (2008), with permission from Elsevier.

In the QLD83/84 dataset, 27% of maltreated young people engaged in youth offending. This percentage is higher than the overall percentage identified in the QLD90 sample (15.7%). As demonstrated in Table 6.13, and observed by Stewart et al. (2008), the percentage of individuals engaging in youth crime ranged across the trajectory groups from 16.7% to 51.4%.

Table 6.14 ranks the six trajectory groups identified by Stewart et al. (2008) from highest to lowest (1 = highest, 6 = lowest) according to the percentage of individuals who engaged in offending, the frequency of maltreatment events over the life-course, and the overrepresentation of Indigenous young people. This table was produced in order to assist with comparability of results across the QLD83/84 dataset and the QLD90 dataset, and to further identify the links between maltreatment timing, chronicity and frequency. In addition, the developmental period in which each group experienced a peak in maltreatment frequency is recorded. For each column, the three highest scoring trajectory groups are highlighted in bold. The equivalent table (Table 6.9) reported for the QLD90 dataset included an additional column representing the experience of multiple maltreatment types. Details regarding the experience of multiple maltreatment types were not available in the figures reported by
Stewart et al. (2008), preventing comparison of results relating to this maltreatment dimension.

Table 6.14

*The six trajectory groups in the QLD83/84 dataset ranked from highest (1) to lowest (6) according to offending, maltreatment frequency, and over-representation of Indigenous young people.*

<table>
<thead>
<tr>
<th>Trajectory</th>
<th>Offending (%)</th>
<th>Maltreatment frequency (M)</th>
<th>Overrepresentation of Indigenous young people (%)</th>
<th>Maltreatment peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ECL-AV</td>
<td>6</td>
<td>3</td>
<td>5</td>
<td>Early</td>
</tr>
<tr>
<td>2. PST-CV</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>Transition</td>
</tr>
<tr>
<td>3. PST-LV</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>Transition</td>
</tr>
<tr>
<td>4. SST-CV</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>Transition</td>
</tr>
<tr>
<td>5. SST-LV</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>Transition</td>
</tr>
<tr>
<td>6. AL-AV</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>Adolescence</td>
</tr>
</tbody>
</table>

As indicated in Table 6.14, the two chronic maltreatment groups had the highest percentage of young people who engaged in offending. This is consistent with the results using the QLD90 dataset. Specifically, in the QLD90 dataset, the highest percentages of offending youths were found in the chronic victimisation groups. As with the QLD90 dataset, in the QLD83/84 dataset, each of the chronic maltreatment groups was also a high frequency group, which creates difficulty with interpretation regarding the unique impact of maltreatment chronicity versus frequency on offending rates.

Importantly, to make any conclusions regarding the impact of maltreatment frequency and chronicity on youth offending, it is necessary to also consider the timing of the maltreatment. According to Stewart et al. (2008), the QLD83/84 trajectory groups which were least likely to offend were the groups confined to the early years (Groups 1 (ECL-AV) and 3 (PST-LV)). This is similar to a result in the QLD90 dataset. Specifically, as identified earlier, Groups 1 (ECL-AV) and 3 (PST-LV) in the QLD83/84 dataset were similar in nature to Groups 4 (MCL-LV) and 5 (ECL-LV) in the QLD90 dataset. Groups 4 (MCL-LV) and 5
(ECL-LV) in the QLD90 dataset were, likewise, the two groups with the lowest percentage of individuals engaging in youth offending.

Stewart et al. (2008) highlighted the importance of maltreatment during adolescence, and concluded that offending was more likely in groups that included adolescent maltreatment. As identified above, each group which experienced a peak in maltreatment frequency close to or during adolescence had a high percentage of individuals engaging in youth crime. Interestingly though, Group 2 (PST-CV) had the second highest percentage of individuals engaging in youth offending, yet, on average, the final maltreatment episode for individuals in this group occurred prior to adolescence (M=9.95, SD=3.74). This may suggest that it was the chronicity of maltreatment in this group, rather than the timing of the maltreatment, which led to a higher percentage of individuals engaging in youth crime. However, as mentioned earlier, the discontinuing maltreatment substantiations for this group may indicate that maltreatment ceased, or could indicate an alternative turning point such as removal from the parents through child protection intervention or incarceration, relocation of the family outside of Queensland jurisdiction, or perhaps the affected young person running away from home. Though these possibilities cannot be explored further in this thesis, future research may benefit from inclusion of qualitative data to explore this topic further.

The results presented thus far indicate that maltreatment timing, frequency and chronicity are important variables to consider in relation to links between maltreatment and offending. In addition, in the QLD83/84 analysis the group with the highest overrepresentation of Indigenous Australian young people was also the group with the highest percentage of youths engaging in crime. This is consistent with the results of the QLD90 dataset, however, the effect of Indigenous status was seemingly more apparent in the QLD90 dataset because overrepresentation was apparent in all three groups with the highest percentage of offending young people. In the QLD83/84 dataset, overrepresentation of Indigenous young people was less consistent with offending, as demonstrated by the overrepresentation of Indigenous Australian young people in a trajectory group with a low percentage of offending young people.

In the QLD90 dataset, the two groups which experienced a peak in maltreatment frequency at a transition point appeared to have a high percentage of individuals who engaged in crime. Importantly, both of these trajectory groups also experienced chronic
maltreatment. However, in the QLD83/84 dataset, only the chronic groups which showed a high peak in maltreatment frequency at a transition point had a high percentage of young offenders, while chronic groups with a low peak in maltreatment frequency did not. Clearly, the relationship between transition points, maltreatment frequency, chronicity and offending requires additional attention.

6.3.2.3 Summary and discussion of results addressing Research Question Two.

Perhaps the most important result of this study is the illustration of the overlap of maltreatment dimensions. By extension, this study has highlighted the importance of research designs that allow simultaneous consideration of all maltreatment dimensions, as these are unlikely to be distinct amongst maltreated individuals. In particular, there appear to be some interrelationships between maltreatment chronicity, timing, frequency and type. It is likely that each of these maltreatment dimensions, when examined in isolation, could show a clear link to offending, however, isolated examination of any single maltreatment dimension would drastically under-represent the complex relationships which occur between them, which may possibly affect their observable impact on offending.

Taken together, the results of this trajectory analysis indicate the need for additional research regarding the overlap between various dimensions of maltreatment, and the unique contribution of each to offending outcomes. These overlaps are explored further in Study 3. In particular, the results of this study indicate that future research must account for maltreatment chronicity, frequency, and timing, as well as the impact of transition points on offending by maltreated young people. Additionally, the results of this study highlight the need for more research which considers differences in maltreatment experiences of Indigenous young people compared to non-Indigenous young people, as well as the potentially differential relationships between these experiences and offending. These observations are consistent with assertions of DST and DLC, as noted in Chapter Two of this thesis.

Comparison of the results from the QLD90 dataset and the QLD83/84 dataset highlight the value in considering the experience of multiple maltreatment types over the life-course. As indicated in the results for the QLD90 dataset, it is relatively common for
maltreated young people to experience multiple maltreatment types over the life-course. These results highlight potential limitations and dangers associated with research that accounts for any single maltreatment type in isolation. The absence of information regarding multi-type maltreatment in the QLD83/84 cohort resulted in some difficulty in comparison of results obtained across the cohorts.

As highlighted in Figure 4.1 in Chapter Four, rates of maltreatment notifications and substantiations changed considerably in Queensland from 1983 to 2008. Specifically, rates of maltreatment substantiations appeared to increase steadily from 1983 to around 2003, and then steadily decreased to 2008. As discussed in Chapter Four, this may be due to changes in awareness of maltreatment, and is also associated with changes to Departmental policies and procedures, particularly in relation to data recording. Likewise, classifications regarding the most serious harm type also changed over time. Regardless of the reasons for these variations over time, it is important to consider their potential impact on comparisons across the QLD90 and QLD83/84 datasets.

Young people in the QLD83/84 dataset had contact with the Queensland child protection system at a time when overall maltreatment notifications and substantiations were steadily increasing. Importantly, they had exited the child protection system before overall notification and substantiation rates appeared to decrease. Alternatively, young people in the QLD90 dataset reached adolescence at the time when overall maltreatment notifications and substantiations appeared to decrease. There was potential for this historical context to affect observed links between maltreatment timing and subsequent offending across these datasets.

Surprisingly, the historical context surrounding these two datasets appeared to have minimal impact on maltreatment trajectories. Specifically, results pertaining to maltreatment timing across the two datasets were largely consistent. Offending appeared to be more likely when a peak in maltreatment frequency occurred at a transition point and when maltreatment began or continued into adolescence. Importantly, the results from each dataset reveal overlap between maltreatment dimensions, particularly maltreatment timing, chronicity, frequency and type, and indicate the need for addition research aimed at isolating the unique impact of each.
Though specific overlaps between these variables changed slightly across the datasets, the key result relates to the existence of these overlaps in both datasets, rather than their nature. As noted earlier, changes in substantiation decisions regarding the “most serious harm type” over time, may have resulted in observable variations across the cohorts regarding the maltreatment types experienced and the timing of each of these, yet the possibility remains that the “lived experiences” of the maltreatment across the cohorts was consistent. Hence, it is difficult to determine whether the variations noted across the cohorts are genuine reflections of changing links across cohorts, or artifice, based on the impact of historical context on administrative child protection data, subsequent changes to substantiated harm type, and consequent variations to observed links between maltreatment dimensions and offending across the cohorts.

6.4 Strengths and limitations of SPGM

SPGM was able to provide some illustration of the complex and heterogeneous nature of life-course maltreatment experiences. Though SPGM did illustrate complexities, it was unable to account for unique contributions from any single maltreatment dimension, given the considerable overlap between these. Comparatively, as discussed in Study 1, logistic regression could not effectively illustrate the heterogeneous nature of life-course maltreatment experiences. While logistic regression could be used to examine the significance of a single maltreatment dimension, it could not be used to identify the nature of maltreatment experiences of affected young people, such as the experience of multiple maltreatment types, or the continuity and discontinuity of maltreatment over the life-course.

Though the results of both logistic regression and SPGM provide valuable responses to the Research Questions of this thesis, some elements of the links between maltreatment dimensions and offending remain unclear and unanswered. The relationships between maltreatment dimensions, Indigenous status, and criminal offending, appear to be complex. While SPGM and the subsequent descriptive analyses were useful in providing an indication of this complexity, the unique contribution of each maltreatment dimension became difficult to ascertain, due to the obvious overlap between them.
Some of the results of this study highlighted the potential importance of maltreatment at transition points. Unfortunately, the processes underlying the impact of transition points cannot be effectively determined in this thesis without additional data. Qualitative, self-report data would likely provide a degree of insight. This topic would benefit from addition research in future.

Overall, the comparison of conclusions drawn from Study 1 and Two indicates that there is a requirement for an alternative methodological approach which is capable of illustrating the complex relationships between maltreatment type, timing and frequency, and Indigenous status, whilst also delineating their unique contributions to youth offending. Study 3 presents the exploratory application of a relatively new method of analysis termed the Conjunctive Analysis of Case Configurations (Miethe et al., 2008).

6.5 Conclusion and Links to Study 3

Taken together, the results of Study 1 and Two highlight the potential importance of all maltreatment dimensions as well as Indigenous status and sex, to research on the links between maltreatment and youth offending. However, neither binary logistic regression nor SPGM was able to independently and simultaneously reflect the complex and heterogeneous nature of life-course maltreatment experiences, whilst also accounting for the unique impact of each maltreatment dimension on maltreatment and offending links. In order to provide a more adequate response to Research Question One, there is a requirement for a method which provides a clear illustration of the complex nature of maltreatment experiences of individuals who offended, versus those who did not, in addition to some measure of the differential and unique impact of isolated maltreatment dimensions such as maltreatment subtypes, timing, chronicity, and frequency.

In response to the above observations and conclusions, and in an attempt to address remaining gaps and challenges with interpretation of the preceding results of Study 1 and Two, Study 3 examines the links between maltreatment experiences and juvenile offending, through application of a relatively new technique called Conjunctive Analysis of Case Configurations (CACC).
7.1 Chapter Overview

This chapter presents the methodology and results of Study 3, which was designed to extend the response of this thesis to Research Question One: Which maltreatment dimensions are related to youth offending? The methodology of this study is an application of the analytical approach outlined by Miethe et al. (2008) who investigated the risk of imprisonment amongst federal drug offenders using a technique they termed Conjunctive Analysis of Case Configurations (hereafter referred to as CACC). Study 3 represents an exploratory application of CACC to maltreatment and offending data, using the QLD90 cohort dataset. Influenced by the results of Study 1 and 2, an important goal of Study 3 is to delineate the unique and shared impact of maltreatment dimensions on youth offending. The second research question of this thesis is not addressed by this study, as this is the first known application of CACC to child protection data and comparative data for other cohorts are not available.

Section 7.2 of this chapter presents the method of this study, including an outline of data preparation, the research variables, and the resulting CACC matrix and maltreatment configurations. The results of this Study are presented in Section 7.3 of this chapter. The performance and interpretation of CACC requires an exploratory, iterative process. The effect of each research variable on the outcome variable is examined separately through a step-by-step process of continuous resorting of the data. Hence, the results section of this chapter is divided into numerous subsections separately exploring the impact of each predictor variable. This process allows examination of the impact of each maltreatment dimension, as well as the potential for variation in maltreatment and offending links across males and females, and Indigenous Australian and non-Indigenous Australian youths. This chapter is concluded in Section 7.4, which is a brief summary of the key findings of this study in relation to Research Question One: Which maltreatment dimensions are related to youth offending?, and a discussion of the strengths, limitations, and potential value of this method for future maltreatment and offending research.
7.2 Method

Miethe et al. (2008, p. 227) describe CACC as “...a simple exploratory technique for the multivariate analysis of categorical data”. CACC allows exploration of causal relationships and interrelationships among categorical variables, and is useful for both exploratory data analysis and confirmatory research (Miethe et al., 2008). To perform CACC, all predictor and outcome variables must be categorical. The data are then aggregated with each predictor variable treated as a break variable. After following this process a new dataset, called a matrix, is created. A CACC matrix presents all possible combinations or configurations of variables and their levels, and reports the number of individual cases falling within each. Miethe et al. (2008) suggest deleting all configurations accounting for fewer than 10 cases. CACC therefore, provides a simple means of identifying and eliminating low-frequency configurations, which can assist with “...generating more stable estimates of net effects and their standard errors” (Miethe et al., 2008, p. 233). According to Hart and Miethe (2014, p. 186), “...the resulting table contains one row for each dominant profile that is empirically observed in the data. Columns in this table represent each focal variable used in the analysis”.

The maximum number of rows and columns within the matrix table depends upon the number of predictor variables, and their levels. For example, if three binary predictor variables were included in the CACC, a matrix table would be produced that allowed representation of all possible combinations of those variables and their levels (i.e., $2^3 = 8$), hence a maximum of 8 possible configurations in the matrix. Adapting the above example to two binary variables and two variables with three levels each, the resulting matrix would include a maximum of 36 possible configurations (i.e., $2^2 \times 3^2 = 36$).

When the CACC is performed, the relative distribution of the outcome variable is calculated for each configuration. In the current study, the outcome variable is a binary variable representing the absence (0) or presence (1) of a conviction as a youth. In this instance, the CACC reports each configuration’s mean score for this variable, which represents the proportion of cases or individuals within the configuration who received a conviction (i.e., cases where the outcome variable = 1). For example, in the current Study, a configuration with .70 recorded for the outcome variable, indicates that 70% of the
individuals with that particular combination of maltreatment substantiations went on to receive a conviction. To aid interpretation, the number of cases falling within each configuration is also reported, allowing immediate identification of the most common and least common combinations of attributes or configurations.

To be clear, CACC is a method of analysis that enables visual inspection of the data to determine the number of cases experiencing each configuration of variables, as well as the relationship between each of these configurations and the outcome variable. This method enables monitoring of the effects of an isolated predictor variable by comparing the proportion of cases experiencing the outcome variable of interest, across two or more otherwise identical configurations except for their experience of the predictor variable of choice. For example, by using this method with the QLD90 dataset, it is possible to compare groups of individuals with identical combinations of substantiated maltreatment attributes, who differ only with regard to their Indigenous status. It is also possible to compare groups of individuals whose substantiated maltreatment configurations are otherwise identical except for the type of maltreatment substantiated, or the time at which the maltreatment substantiation occurred. Hence, CACC allows simultaneous consideration of each distinct maltreatment dimension and its unique contribution to youth offending.

7.2.1 Development of the CACC matrix.

The CACC was performed on the QLD90 dataset. Importantly, only individuals with at least one substantiated maltreatment event were included in this analysis. Furthermore, as with earlier analyses, individuals whose conviction preceded their first substantiated maltreatment event were excluded. This resulted in a final selection of 4478 individuals. The CACC was performed using IBM SPSS Statistics Package Version 22.

7.2.1.1 Variables.

The outcome variable of interest is youth offending, as represented by the presence (1) or absence (0) of at least one conviction in court as a youth. In the CACC matrix and results tables, this variable is presented as ‘Offended (M)’, because, as described above, the CACC reports the average outcome for individuals in the configuration. This process results in a score on the outcome variable for each configuration, which can range from 0 to 1.
score of .70, for example, indicates that 70% of the individuals in the configuration received a conviction as a youth.

The predictor variables of interest in this study are: Indigenous (no/yes); sex (female/male); maltreatment subtypes, as represented by neglect (no/yes), sexual abuse (no/yes), physical abuse (no/yes), and emotional abuse (no/yes); maltreatment timing, as represented by early childhood (no/yes), middle childhood (no/yes) and adolescence (no/yes); and maltreatment frequency (low/moderate/high). Each of these variables was utilised in previous analyses across Study 1 and Study 2, except for ‘maltreatment frequency’.

To calculate the new variable ‘maltreatment frequency’, the pre-existing variable representing the sum of substantiated maltreatment events over the life-course was examined. The total number of maltreatment events ranged from 1 to 20, with 2530 individuals (56%) experiencing only one event, an additional 1307 individuals (29%) experiencing two or three events, and the remaining 674 individuals (15%) experiencing four or more events. When the ‘Explore’ option in SPSS was utilised to examine this variable, cases with four or more events were classified as outliers. To reflect this distribution of frequencies, a new variable was created in which cases with one substantiated maltreatment event across the life-course were considered “low frequency”, cases with two to three substantiated events were classified as “moderate frequency”, and cases with four or more substantiated events were considered “high frequency”.

It is important to reiterate here that the configurations presented in this chapter reflect patterns of substantiated maltreatment events and offending outcomes. As noted through previous chapters, substantiated maltreatment may not necessarily reflect actual maltreatment experiences. The maltreatment events included in this analysis are restricted to those that were reported to the Department and were substantiated as harm or risk of harm. Experiences of maltreatment that were not brought to the attention of the Department, or could not be substantiated by the Department, were not included in the analysis. Consistent with legislative requirements and departmental policies and procedures, each maltreatment event was coded according to the “most serious harm type” substantiated by the department at the time of the assessment. In this sense, cases in the dataset that are recorded as seemingly “isolated” maltreatment events or types, may in reality be cases in which the child or young person experienced multiple maltreatment events or types that were not reported, or could not
be substantiated by the department. While these limitations are typical of research relying on administrative data and were acknowledged in Studies 1 and 2, they are particularly pertinent in this Study due to the goal of delineating the unique and shared impact of maltreatment dimensions on youth offending. The maltreatment configurations presented throughout this chapter are best viewed as profiles of system contact for substantiated maltreatment and associated youth offending convictions, rather than actual profiles of maltreatment and offending.

7.2.1.2 Final matrix.

Based on the nature of the ten predictor variables included in this CACC, there was a maximum of 1536 possible configurations (i.e. $2^9 \times 3^1 = 1536$). When the CACC was performed, the resulting matrix included only 476 configurations which successfully accounted for all 4478 individuals. Consistent with the general rule regarding minimum cell frequencies (Miethe et al., 2008), configurations which contained fewer than 10 cases were deleted. Following deletion of these low frequency configurations, there were 88 configurations remaining for examination. These retained configurations accounted for 3407 individuals, from the original sample of 4478.

7.2.1.3 Expected generalisability of the results to the QLD90 cohort: Comparison of deleted and retained configurations.

Before deleting the configurations with fewer than ten cases, basic descriptive results were produced to compare the characteristics of configurations with fewer than ten cases, with configurations with ten or more cases. As shown in Table 7.1, the distribution of sex, Indigenous status, and maltreatment dimensions amongst the configurations with less than ten cases (deleted configurations), differed from the distribution of maltreatment dimensions amongst the configurations with ten or more cases (retained configurations). To be clear, configurations with ten or more cases are considered dominant maltreatment configurations.
Table 7.1

The distribution of maltreatment dimensions, sex and Indigenous status, amongst configurations with less than ten cases (i.e., deleted configurations) compared to configurations with ten or more cases (i.e., retained configurations).

<table>
<thead>
<tr>
<th></th>
<th>n&lt;10</th>
<th>n10+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of configurations</td>
<td>388</td>
<td>88</td>
</tr>
<tr>
<td>Indigenous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No (%)</td>
<td>55.9</td>
<td>81.8</td>
</tr>
<tr>
<td>Yes (%)</td>
<td>44.1</td>
<td>18.2</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female (%)</td>
<td>54.4</td>
<td>46.6</td>
</tr>
<tr>
<td>Male (%)</td>
<td>45.6</td>
<td>53.4</td>
</tr>
<tr>
<td>Maltreatment timing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early (%)</td>
<td>55.2</td>
<td>31.8</td>
</tr>
<tr>
<td>Middle (%)</td>
<td>57.2</td>
<td>44.3</td>
</tr>
<tr>
<td>Adolescence (%)</td>
<td>61.9</td>
<td>53.4</td>
</tr>
<tr>
<td>Maltreatment type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neglect (%)</td>
<td>58.0</td>
<td>53.4</td>
</tr>
<tr>
<td>Emotional (%)</td>
<td>47.4</td>
<td>38.6</td>
</tr>
<tr>
<td>Physical (%)</td>
<td>51.8</td>
<td>42.0</td>
</tr>
<tr>
<td>Sexual (%)</td>
<td>38.7</td>
<td>9.1</td>
</tr>
<tr>
<td>Frequency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (%)</td>
<td>2.8</td>
<td>42.0</td>
</tr>
<tr>
<td>Moderate (%)</td>
<td>46.1</td>
<td>44.3</td>
</tr>
<tr>
<td>High (%)</td>
<td>51.0</td>
<td>13.6</td>
</tr>
<tr>
<td>Total Individuals</td>
<td>1071</td>
<td>3407</td>
</tr>
</tbody>
</table>

The figures presented in Table 7.1 indicate that Indigenous Australian young people were overrepresented amongst the deleted configurations compared to the retained configurations. This may reflect the smaller number of Indigenous young people in the overall sample, or alternatively may indicate that maltreatment substantiations among Indigenous young people are more varied than maltreatment substantiations among non-Indigenous young people, resulting in their restricted presence in “dominant” maltreatment profiles. Similarly, females were slightly less represented amongst retained configurations than deleted configurations.
Though the general pattern of maltreatment timing and type remained fairly consistent across the retained and deleted configurations, there was an obvious reduction in the representation of sexual abuse in the retained configurations. This may indicate that only a small number of individuals received substantiations for sexual abuse, or alternatively, that the experiences of sexually abused young people vary widely, resulting in their reduced presence in dominant configurations.

Lastly, there was a considerable difference between the distribution of maltreatment frequency amongst retained and deleted configurations. Compared to non-dominant profiles, individuals in dominant profiles were more likely to experience a low frequency of maltreatment substantiations and less likely to experience a high frequency of maltreatment substantiation across the life-course. This may indicate that configurations in which a high frequency of maltreatment substantiations were experienced, reflect a smaller proportion of individuals, or alternatively, represent a broader range of experiences of maltreatment, preventing their inclusion in dominant profiles.

The above figures indicate the need for caution when interpreting the results pertaining to Indigenous males and females, as their lived experiences may be particularly underrepresented by the retained configurations. Nonetheless, the retained dominant profiles do provide some opportunity to determine the impact of a range of maltreatment dimensions. The wide variability evident across the retained 88 configurations, allows investigation into the unique contribution of maltreatment dimensions to youth offending overall. Furthermore, the existence of 88 dominant maltreatment configurations immediately illustrates the complex nature of life-course maltreatment experiences. The remaining analyses presented in this chapter account for dominant profiles of maltreatment, and their links with youth offending. It is important to acknowledge that there was a large sample of young people (N=1071) who experienced an ‘uncommon’ or ‘non-dominant’ pattern of maltreatment who were excluded from these analyses. The relationships between these non-dominant configurations of maltreatment and offending remain unknown.
7.2.1.4 General description of the retained configurations.

As a starting point for data exploration, basic descriptive statistics regarding the 88 retained, dominant configurations were examined. These figures extend those presented in Table 7.1. Across the total 88 configurations, there were nine configurations made up of Indigenous males, seven configurations made up of Indigenous females, 38 configurations made up of non-Indigenous males, and 34 configurations made up of non-Indigenous females.

With regards to substantiated maltreatment types, neglect was present in 47 configurations, emotional abuse was present in 34 configurations, physical abuse was present in 37 configurations and sexual abuse was present in eight configurations. These figures immediately indicate that multiple maltreatment types were present in numerous configurations, however, based on the above figures it appears that neglect was the most commonly substantiated maltreatment type, followed by physical abuse, emotional abuse, and sexual abuse, respectively. This overall distribution of substantiated maltreatment subtypes from most common to least common is consistent with figures presented in Study 2.

With regards to maltreatment timing, or timing of substantiated maltreatment, early childhood maltreatment was experienced in 28 configurations, middle childhood maltreatment was experienced in 39 configurations, and adolescent maltreatment was experienced in 47 configurations. These figures indicate the existence of chronic maltreatment configurations, meaning for some configurations, maltreatment was experienced in more than one developmental period. Lastly, with regards to maltreatment substantiation frequency, there were 12 configurations characterised by a high frequency of maltreatment, 37 characterised by a low frequency of maltreatment, and 39 characterised by a moderate frequency of maltreatment.

7.3 Results

A matrix with ten predictor variables and 88 configurations is too large to present in a single table. Hence, throughout this chapter, only a small selection of configurations is presented at any one time to illustrate pertinent trends. It is important to note here, that comparison of configurations is restricted to noting which configuration was associated with the highest mean offending rate. It is not possible to
comment throughout this chapter whether the noted differences between the mean offending rates of contingences are significant. Hence, these data are largely descriptive and exploratory, and pertain to general observable trends rather than statistical significance of any observed relationships.

As noted in the introduction of this chapter, the performance and interpretation of a CACC is an exploratory, iterative process. It is necessary to examine each research variable one-at-a-time using a step-by-step process of continuously re-sorting the data. In this results section exploration of the impact of each maltreatment dimension on youth offending, and the potential for interactions between maltreatment dimensions, occurs in a step-by-step manner. Trends noted in initial examinations of the data inform the process of later examinations.

Extending from the results of Study 1 and Study 2, the starting point in this results section is examination of the most frequently populated maltreatment configurations (section 7.3.1.1), followed by examination of the degree of overlap between maltreatment dimensions (section 7.3.1.2). Examination of the most frequently populated configurations enables identification of the most common maltreatment configurations and youth offending outcomes. This provides an important point of comparison for later examinations of less populated configurations. Examination of the degree of overlap between maltreatment dimensions enables early identification of potential challenges to interpretation of the results.

7.3.1 Initial exploration.

7.3.1.1 The most frequently populated maltreatment configurations:

Offending outcomes.

As an initial point of inquiry, the 88 configurations in the CACC matrix were sorted in descending order according to the number of individuals fitting within each. The ten most frequently populated maltreatment configurations are presented in Table 7.2.
Table 7.2

*The ten most frequently populated configurations (N = 1437 individuals: 32% of maltreated children in the QLD90 dataset)*

<table>
<thead>
<tr>
<th>Config.</th>
<th>Indigenous</th>
<th>Sex</th>
<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
<th>Offended (M)</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Early</td>
<td>Middle</td>
<td>Adolescent</td>
<td>Neglect</td>
<td>Emotional</td>
<td>Physical</td>
</tr>
<tr>
<td>1</td>
<td>No</td>
<td>Female</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>No</td>
<td>Female</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>No</td>
<td>Male</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>No</td>
<td>Male</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>No</td>
<td>Female</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td>No</td>
<td>Female</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>No</td>
<td>Male</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>No</td>
<td>Male</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>9</td>
<td>No</td>
<td>Male</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>10</td>
<td>No</td>
<td>Male</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

1437 32.1
As shown in Table 7.2, the ten most frequently populated configurations were made up of non-Indigenous young people, experiencing a low frequency (single episode) of maltreatment substantiations. Overall, these ten configurations accounted for 1437 individuals, representing 32% of the total 4478 maltreated individuals in the QLD90 dataset. These observations are consistent with earlier observations reported in this thesis. Specifically, though Indigenous young people are overrepresented in the child protection system, child protection data largely pertain to non-Indigenous young people experiencing a low frequency of maltreatment substantiations. The single largest configuration (Configuration 1) accounted for 215 individuals, representing only 4.8% of the total 4478 maltreated individuals in the QLD90 dataset. This assists in illustrating the heterogeneous nature of life-course maltreatment experiences.

As shown in Table 7.2, substantiation of each maltreatment type varied across these large configurations. Sexual abuse was the least common, and neglect was most common, though each maltreatment type was represented. Maltreatment substantiation was most common during adolescence. Again, these observations are consistent with earlier observations regarding the general nature of child protection data.

As reported in Chapter Four, in the QLD90 dataset, 7.4% (n=154) of maltreated non-Indigenous females, 16% (n=278) of maltreated non-Indigenous males, 32.6% (n=111) of maltreated Indigenous females, and 50.8% (n=161) of maltreated Indigenous males received a conviction in court. Overall, as discussed in earlier chapters of this thesis, approximately 15.7% of maltreated young people in the QLD90 dataset engaged in youth offending. Additionally, as reported in Chapter Four, combined figures from Allard et al. (2010) and the QLD90 dataset indicate that amongst the total population of QLD youths born 1990, not limited to those who were maltreated, 1.43% of non-Indigenous females (380 of 26,600), 4.3% of non-Indigenous males (1219 of 28,320), 13.42% of Indigenous females (207 of 1543), and 35.08% Indigenous males (523 of 1491) received a conviction in youth court.

As demonstrated in Table 7.2, within the 10 largest maltreatment configurations, with the exception of one configuration, the proportion of young people who engaged in offending was lower than the overall average for maltreated young people (i.e. <0.15). Specifically, in configuration 7, which represents non-Indigenous males neglected in adolescence, 18% of individuals engaged in offending. Across the remaining 9 large
configurations, the average percentage of young people engaging in offending ranged from 3% to 13%. These large configurations illustrate the general observation that most children with a substantiated maltreatment event do not engage in crime.

Interestingly though, adolescent maltreatment substantiations of any type (with the exception of sexual abuse), appeared to be associated with a rate of offending amongst non-Indigenous females which was close to the overall average for this maltreated sub-group (i.e. 7.4%), while all but one configuration of low frequency maltreatment among non-Indigenous males was associated with a lower rate of offending than the sub-group average (i.e. 16%). These results indicate the need for additional examination of the impact of Indigenous status, sex, and the varying impacts of maltreatment dimensions on offending rates, with particular emphasis on potential interactions between these factors and the effect of these interactions on offending rates.

Lastly, it is important to acknowledge that each of these large low maltreatment substantiation frequency configurations was associated with a rate of offending that was higher than each relevant sub-group average in the overall population of young people born 1990. Hence, a single substantiated maltreatment event over the life-course, in most cases, was associated with a higher likelihood of offending when compared to their presumably non-maltreated counterparts in the overall cohort.

**7.3.1.2 Overlap of maltreatment dimensions.**

Influenced by the results of Study 1 and 2, in this Study it is important to explore the relationship or overlap between maltreatment dimensions. The results of Study 2 indicated a potential overlap between maltreatment frequency and other maltreatment dimensions, such as chronicity and the experience of multi-type maltreatment. To assist this exploration, all 12 configurations which represent a high frequency of maltreatment are presented in Table 7.3.
Table 7.3

Twelve configurations with a high maltreatment frequency (4+ substantiated episodes of maltreatment across the life-course)

<table>
<thead>
<tr>
<th>Config.</th>
<th>Indigenous</th>
<th>Sex</th>
<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
<th>Offended</th>
<th>N</th>
<th>% of Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Early</td>
<td>Middle</td>
<td>Adolescence</td>
<td>Neglect</td>
<td>Emotional</td>
<td>Physical</td>
</tr>
<tr>
<td>60</td>
<td>No</td>
<td>Female</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>48</td>
<td>No</td>
<td>Male</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>81</td>
<td>No</td>
<td>Female</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>78</td>
<td>No</td>
<td>Female</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>79</td>
<td>No</td>
<td>Male</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>74</td>
<td>Yes</td>
<td>Male</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>71</td>
<td>No</td>
<td>Male</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>42</td>
<td>No</td>
<td>Female</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>37</td>
<td>No</td>
<td>Male</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>50</td>
<td>No</td>
<td>Female</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>44</td>
<td>No</td>
<td>Male</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>73</td>
<td>Yes</td>
<td>Male</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
The 12 high maltreatment frequency configurations account for 3.7% (n=164) maltreated individuals. As demonstrated by Table 7.3, all high frequency maltreatment substantiation configurations were characterised by the experience of multi-type maltreatment, suggesting that a high frequency of maltreatment is rarely restricted to a single maltreatment type. Further, sexual abuse was absent, and neglect was present, in all 12 high frequency configurations. Physical abuse and emotional abuse were also present in the majority of high frequency configurations. These figures indicate that the impact of multi-type maltreatment on offending rates requires additional focus, and future research regarding maltreatment frequency, should also account for multiple maltreatment types.

Ten of the 12 high maltreatment frequency configurations experienced chronic maltreatment, meaning substantiated maltreatment in more than one developmental period. This suggests that a high maltreatment frequency is rarely restricted to a single developmental period. Eleven of the 12 configurations had substantiated maltreatment in adolescence. Interestingly, the only configuration in which maltreatment was not substantiated in adolescence had substantiated maltreatment in both early and middle childhood. It is possible that this configuration represents cases where maltreatment ceased prior to adolescence, though, as discussed in earlier chapters, could also represent cases in which an alternative turning point occurred which prevented substantiation in adolescence, such as the movement of the affected family away from Queensland jurisdiction, distancing of the affected child from notifying individuals, or removal of the child from the home through foster care, running away, or incarceration. These possibilities cannot be further examined within the QLD90 dataset using the current available data, but do suggest the need for caution in interpretation of results here regarding the impact of adolescent maltreatment, versus chronic maltreatment over early and middle childhood. Likewise, the overlap between maltreatment chronicity and multi-type maltreatment must be considered in future research, particularly using data not restricted to administrative records of substantiated events.

Though there were more male than female high frequency configurations, the figures in Table 7.3 suggest that high frequency maltreatment substantiation is relevant to both sexes. There were only two configurations representing Indigenous young people, which may be a reflection of the overall smaller number of configurations for Indigenous youth, or could relate to an earlier observation that high frequency
maltreatment substantiation amongst Indigenous youth is heterogeneous, preventing
their representation in dominant high frequency profiles.

Of the 12 high maltreatment frequency configurations, only four had a lower
proportion of offenders than the overall sample of maltreated young people (i.e. over
0.15). The four high maltreatment frequency configurations with a proportion of
offending individuals lower than 15% were made up of non-Indigenous young people.
Three of these four configurations were made up non-Indigenous females. As
mentioned previously, the average rate of offending for non-Indigenous maltreated
females was 7.4%. Hence, only one of these three configurations (configuration 42)
offended at a lower than average rate for non-Indigenous females, and was characterised
by middle childhood and adolescent maltreatment substantiations, including neglect,
emotional abuse and physical abuse. Interestingly, when these same maltreatment types
were substantiated for non-Indigenous females across early childhood as well as middle
childhood and adolescence (configuration 50), the rate of offending was higher than the
sub-group average. The fourth of these lower than average offending configurations was
made up of non-Indigenous males with substantiated chronic pre-adolescent
maltreatment, including neglect, physical abuse and emotional abuse (configuration 71).
Interestingly, when these same maltreatment types were substantiated for non-
Indigenous males in middle childhood and adolescence (configuration 37), the rate of
offending was higher than the sub-group average. These combined observations
potentially indicate a gendered effect of maltreatment timing, type and chronicity,
which warrants additional investigation in this chapter.

Overall, these observations pertaining to high maltreatment substantiation
frequency configurations indicate that maltreatment frequency does contribute to youth
offending, but cannot independently account for all variation in offending rates among
maltreated children. Perhaps more importantly, these figures indicate that maltreatment
frequency is somewhat interrelated with maltreatment chronicity, the experience of
multi-type maltreatment, and maltreatment timing. These maltreatment dimensions, the
relationships between them, and their impact on youth offending remain the focus of the
remainder of this study.
7.3.2 Research Question One: Which maltreatment dimensions are related to youth offending?

To address Research Question One: Which maltreatment dimensions are related to youth offending? in this Study, across the remainder of this results section the distributions of maltreatment timing, frequency, and subtypes are examined with regards to overall relations between distinct substantiated maltreatment configurations and rates of offending. Of particular interest in this study, is the unique contribution of each predictor variable to variation in rates of youth offending. To explore unique contributions, each predictor variable must be examined consecutively. This is achieved through a process of sorting the configurations to allow examination of otherwise identical configurations, save for the predictor variable of interest at each time. Matched configuration pairs best illustrating these unique contributions are presented throughout this chapter, as required. It is again acknowledged that these maltreatment configurations represent substantiated system contacts only; meaning the impact of other lived experiences of these individuals on offending outcomes cannot be explored here.

As demonstrated in earlier chapters of this thesis, 15.7% of the overall sample of maltreated young people in the QLD90 dataset received at least one conviction. To examine variation in offending rates across the 88 dominant maltreatment configurations, the overall matrix was sorted in descending order according to the mean rate of offending in each configuration. Out of 88 configurations, 35 had a higher proportion of offenders than the overall sample, meaning a mean rate of offending over .15. Taken together, the above observations indicate a range of maltreatment configurations allowing multiple points for comparison across Indigenous and non-Indigenous young people, and males and females, with regards to the variability of substantiated maltreatment type, timing, and frequency and subsequent rates of youth offending.

7.3.2.1 Configurations with the highest proportion of offenders.

As a starting point for examination of variation in offending rates across configurations, the matrix was sorted in descending order with regards to the mean offending rate for each configuration. Table 7.4 presents the ten substantiated
maltreatment configurations with the highest proportion of offenders compared to all other configurations.
Table 7.4

The ten configurations with the highest proportion of offending individuals

<table>
<thead>
<tr>
<th>Config.</th>
<th>Indigenous</th>
<th>Sex</th>
<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency (M)</th>
<th>Offended N</th>
<th>% of Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Early Middle Adolescence</td>
<td>Neglect Emotional Physical Sexual</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>Yes</td>
<td>Male</td>
<td>No No Yes</td>
<td>Yes No No No</td>
<td>Low</td>
<td>0.82</td>
<td>11</td>
</tr>
<tr>
<td>73</td>
<td>Yes</td>
<td>Male</td>
<td>Yes Yes Yes</td>
<td>Yes Yes Yes No</td>
<td>High</td>
<td>0.80</td>
<td>10</td>
</tr>
<tr>
<td>74</td>
<td>Yes</td>
<td>Male</td>
<td>Yes Yes Yes</td>
<td>Yes No Yes No</td>
<td>High</td>
<td>0.70</td>
<td>10</td>
</tr>
<tr>
<td>75</td>
<td>Yes</td>
<td>Male</td>
<td>No No Yes</td>
<td>No No Yes No</td>
<td>Low</td>
<td>0.70</td>
<td>10</td>
</tr>
<tr>
<td>53</td>
<td>Yes</td>
<td>Male</td>
<td>No No Yes</td>
<td>No No Yes No</td>
<td>Low</td>
<td>0.60</td>
<td>15</td>
</tr>
<tr>
<td>37</td>
<td>No</td>
<td>Male</td>
<td>No Yes Yes</td>
<td>Yes Yes Yes No</td>
<td>High</td>
<td>0.57</td>
<td>21</td>
</tr>
<tr>
<td>76</td>
<td>No</td>
<td>Male</td>
<td>Yes Yes No</td>
<td>No No Yes No</td>
<td>Moderate</td>
<td>0.50</td>
<td>10</td>
</tr>
<tr>
<td>77</td>
<td>Yes</td>
<td>Female</td>
<td>No No Yes</td>
<td>Yes No No No</td>
<td>Moderate</td>
<td>0.50</td>
<td>10</td>
</tr>
<tr>
<td>43</td>
<td>Yes</td>
<td>Male</td>
<td>No Yes No</td>
<td>Yes No No No</td>
<td>Low</td>
<td>0.50</td>
<td>18</td>
</tr>
<tr>
<td>38</td>
<td>Yes</td>
<td>Female</td>
<td>No No Yes</td>
<td>No No Yes No</td>
<td>Low</td>
<td>0.48</td>
<td>21</td>
</tr>
</tbody>
</table>
Consistent with above observations regarding the average rate of offending amongst maltreated Indigenous males (50.8%), Indigenous females (32.6%), non-Indigenous males (16%), and non-Indigenous females (7.4%), the five configurations with the highest average rate of offending accounted for Indigenous males only. In particular, as evident in Table 7.4, only two of the 10 configurations included non-Indigenous young people. Non-Indigenous females were not represented in these ten highest offending configurations, while Indigenous females were represented in two of these ten highest offending configurations.

Importantly, adolescent maltreatment was substantiated in eight of the 10 highest offending configurations. In the two configurations in which adolescent maltreatment was not substantiated, maltreatment had been substantiated in middle childhood. As discussed earlier in this chapter, this may indicate that maltreatment ceased prior to adolescence, or a lack of reporting, or an alternative turning point preventing maltreatment substantiations in adolescence.

Only four of the ten configurations had chronic maltreatment substantiations, and three of the ten had substantiated multi-type maltreatment suggesting that these are not stand-alone explanations for variation in offending. Neglect and physical abuse were the most common substantiated maltreatment types, though not all of the ten configurations were restricted to these. Sexual abuse substantiations were absent from all of these ten highest offending configurations, raising doubts about the impact of this maltreatment type on offending rates.

There was a range of maltreatment substantiation frequencies amongst the configurations in Table 7.4. These results indicate that maltreatment frequency is not a standalone explanation for variance in offending. However, additional analyses are required to compare otherwise identical configurations to attempt to identify the unique contribution of maltreatment frequency.

Taken together, these results regarding the ten configurations with the highest rate of offending, indicate the need to further consider the differential impact of maltreatment dimensions on offending rates amongst Indigenous youths versus non-Indigenous youths, and males versus females. Further examination is also required for maltreatment types, particularly neglect, and maltreatment timing, especially during adolescence.
To guide these explorations further, Table 7.5 presents descriptive results comparing the overall distribution of sex, Indigenous status, and maltreatment dimensions amongst configurations with a lower than average proportion of offenders (i.e. \( \leq 15\% \)) and configurations with a higher than average proportion of offenders (i.e. \( >15\% \)).

Table 7.5

*The distribution of maltreatment dimensions, sex and Indigenous status, amongst configurations with a higher than average proportion of offenders (i.e. \( >15\% \)) compared to configurations with a lower than average proportion of offenders (i.e. \( <15\% \)).*

<table>
<thead>
<tr>
<th></th>
<th>&lt;15%</th>
<th>&gt;15%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of configurations</td>
<td>53.0</td>
<td>35.0</td>
</tr>
<tr>
<td>Indigenous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No (%)</td>
<td>98.1</td>
<td>57.1</td>
</tr>
<tr>
<td>Yes (%)</td>
<td>1.9</td>
<td>42.9</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female (%)</td>
<td>58.5</td>
<td>28.6</td>
</tr>
<tr>
<td>Male (%)</td>
<td>41.5</td>
<td>71.4</td>
</tr>
<tr>
<td>Maltreatment timing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early (%)</td>
<td>37.7</td>
<td>22.9</td>
</tr>
<tr>
<td>Middle (%)</td>
<td>45.3</td>
<td>42.9</td>
</tr>
<tr>
<td>Adolescence (%)</td>
<td>39.6</td>
<td>74.3</td>
</tr>
<tr>
<td>Maltreatment type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neglect (%)</td>
<td>47.2</td>
<td>62.9</td>
</tr>
<tr>
<td>Emotional (%)</td>
<td>37.7</td>
<td>40.0</td>
</tr>
<tr>
<td>Physical (%)</td>
<td>39.6</td>
<td>45.7</td>
</tr>
<tr>
<td>Sexual (%)</td>
<td>15.1</td>
<td>0</td>
</tr>
<tr>
<td>Frequency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (%)</td>
<td>45.3</td>
<td>37.1</td>
</tr>
<tr>
<td>Moderate (%)</td>
<td>47.2</td>
<td>40.0</td>
</tr>
<tr>
<td>High (%)</td>
<td>7.5</td>
<td>22.9</td>
</tr>
<tr>
<td>Total Individuals</td>
<td>2701</td>
<td>706</td>
</tr>
</tbody>
</table>

The figures in Table 7.5 indicate that Indigenous young people, males, high frequency maltreatment, neglect and physical abuse, and adolescent maltreatment are overrepresented in substantiated maltreatment configurations with a higher than average rate of offending compared to configurations with a lower than average offending rate.
Again, these observed trends are consistent with earlier observations regarding the overall offending rates of Indigenous males (50.8%), Indigenous females (32.6%), non-Indigenous males (16%), and non-Indigenous females (7.4%), and also indicate the need to further examine maltreatment type, frequency, and timing in additional data exploration.

Based on the above observations the next point of focus for examination of the QLD90 CACC matrix is the impact of Indigenous status on observed maltreatment and offending links.

7.3.2.2 The impact of Indigenous status on observed maltreatment and offending links.

As identified earlier in this chapter, the five configurations with the highest proportion of offending young people were made up of Indigenous males. Similarly, as demonstrated in Table 7.5, Indigenous young people are particularly overrepresented in configurations with a higher than average rate of offenders compared to configurations with a lower than average rate of offenders.

To extend observations in this chapter regarding the impact of Indigenous status on maltreatment and offending links, the matrix was re-examined to identify a sample of configuration pairs which could provide a direct comparison of Indigenous and non-Indigenous young people. Specifically, identical configurations were paired, with variation restricted to Indigenous status only. First, configuration pairs allowing comparison of non-Indigenous and Indigenous males are examined. Second, configuration pairs allowing comparison of non-Indigenous and Indigenous females are examined.

7.3.2.2.1 Comparison of offending rates of Indigenous and non-Indigenous males with identical configurations.

Table 7.6 includes 9 matched pairs of Indigenous and non-Indigenous males.
Table 7.6

Direct comparisons of Indigenous and non-Indigenous males, with otherwise identical maltreatment configurations.

<table>
<thead>
<tr>
<th>Config.</th>
<th>Indigenous</th>
<th>Sex</th>
<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
<th>Offended (M)</th>
<th>N</th>
<th>% of Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Early</td>
<td>Middle</td>
<td>Adolescence</td>
<td>Neglect</td>
<td>Emotional</td>
<td>Physical</td>
</tr>
<tr>
<td>74</td>
<td>Yes</td>
<td>Male</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>79</td>
<td>No</td>
<td>Male</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>73</td>
<td>Yes</td>
<td>Male</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>44</td>
<td>No</td>
<td>Male</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>53</td>
<td>Yes</td>
<td>Male</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>No</td>
<td>Male</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>43</td>
<td>Yes</td>
<td>Male</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>No</td>
<td>Male</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>24</td>
<td>Yes</td>
<td>Male</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>10</td>
<td>No</td>
<td>Male</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>64</td>
<td>Yes</td>
<td>Male</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>9</td>
<td>No</td>
<td>Male</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>54</td>
<td>Yes</td>
<td>Male</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>11</td>
<td>No</td>
<td>Male</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>75</td>
<td>Yes</td>
<td>Male</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>No</td>
<td>Male</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>68</td>
<td>Yes</td>
<td>Male</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>No</td>
<td>Male</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
Examination of Table 7.6 reveals that Indigenous males were consistently more likely to offend than non-Indigenous males, despite identical configurations of maltreatment substantiations. However, more detailed examination reveals that in two pairings (configurations 53-3 and 75-4), the mean rate of offending for the Indigenous males was above average (50.8%), while the mean rate of offending for the non-Indigenous males was below average (16%). These configuration pairs indicate that maltreatment type and timing may affect Indigenous and non-Indigenous males differently. Specifically, isolated substantiations of adolescent physical abuse, and adolescent emotional abuse appear to increase rates of offending more so amongst Indigenous males, than non-Indigenous males. Unfortunately, it is impossible to explore in this thesis the degree to which records of substantiated maltreatment reflect lived experiences of maltreatment. It would be valuable to know whether there are differences between recognition and reporting of suspected maltreatment of Indigenous versus non-Indigenous youth. It is possible that isolated substantiations conceal more extensive maltreatment.

7.3.2.2.2 Comparison of offending rates of Indigenous and non-Indigenous females with identical configurations.

Table 7.7 presents seven matched pairs of Indigenous and non-Indigenous females.
Table 7.7

Direct comparisons of Indigenous and non-Indigenous females, with otherwise identical maltreatment configurations.

<table>
<thead>
<tr>
<th>Config</th>
<th>Indigenous</th>
<th>Sex</th>
<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
<th>Offended (M)</th>
<th>N</th>
<th>% of Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td>Middle</td>
<td>Adolescence</td>
<td>Neglect</td>
<td>Emotional</td>
<td>Physical</td>
</tr>
<tr>
<td>38</td>
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<td>No</td>
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</tr>
<tr>
<td>1</td>
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<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>46</td>
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</tr>
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<td>No</td>
<td>No</td>
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</tr>
<tr>
<td>61</td>
<td>Yes</td>
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<td>Yes</td>
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</tr>
<tr>
<td>2</td>
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<td>No</td>
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<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>77</td>
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<td>Female</td>
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</tr>
<tr>
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<td>Yes</td>
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</tr>
<tr>
<td>49</td>
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<tr>
<td>70</td>
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<tr>
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</tr>
<tr>
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<td>No</td>
<td>Yes</td>
<td>No</td>
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</tr>
<tr>
<td>12</td>
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<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
Table 7.7 reveals that Indigenous females were consistently more likely to offend than non-Indigenous females, despite identical configurations of maltreatment substantiations. However, in two configuration pairs (configurations 38-1 and 49-5), though the mean proportion of offending Indigenous females was higher than average (32.6%), for non-Indigenous females it was lower (7.4%), suggesting some variation in the impact of particular maltreatment dimensions on offending across these two groups. Specifically, isolated substantiations of physical abuse and neglect in adolescence, appeared to increase offending rates more so amongst Indigenous females than non-Indigenous females. The result regarding the impact of adolescent physical abuse is consistent across males and females. Clearly, the impact of distinct maltreatment dimensions across Indigenous compared to non-Indigenous young people requires further investigation. Again, it would be valuable to know whether there are differences between recognition and reporting of suspected maltreatment of Indigenous versus non-Indigenous youth.

The above results indicate that for the remainder of this chapter, comparisons between Indigenous and non-Indigenous young people will be less valuable than comparisons within these two seemingly distinct groups. In the next section, the focus remains on identifying the unique impact of each maltreatment dimension on offending by Indigenous youths. Maltreatment configurations of Indigenous males are examined first, followed by maltreatment configuration of Indigenous females.

### 7.3.2.3 Unique contributions of maltreatment dimensions to offending outcomes for Indigenous youths.

As there are substantially fewer dominant maltreatment configurations representing Indigenous young people, than for non-Indigenous young people, all configurations representing maltreatment experiences for Indigenous males are presented together in Table 7.8, and all configurations representing maltreatment experiences for Indigenous females are presented together in the following Table 7.9.
Table 7.8

*Indigenous males compared according to maltreatment timing, and type and overall proportion of offenders.*

<table>
<thead>
<tr>
<th>Config.</th>
<th>Indigenous</th>
<th>Sex</th>
<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
<th>Offended (M)</th>
<th>N</th>
<th>% of Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Early</td>
<td>Middle</td>
<td>Adolescence</td>
<td>Neglect</td>
<td>Emotional</td>
<td>Physical</td>
</tr>
<tr>
<td>73</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>74</td>
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<td>Yes</td>
<td>Yes</td>
<td>No</td>
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</tr>
<tr>
<td>24</td>
<td>Yes</td>
<td>Male</td>
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<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>68</td>
<td>Yes</td>
<td>Male</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
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<td>No</td>
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</tr>
<tr>
<td>43</td>
<td>Yes</td>
<td>Male</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>64</td>
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<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
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</tr>
<tr>
<td>54</td>
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<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>75</td>
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<td>Male</td>
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<td>No</td>
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<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>53</td>
<td>Yes</td>
<td>Male</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
7.3.2.3.1 Maltreatment configurations for Indigenous males.

As shown in Table 7.8, maltreated Indigenous males were represented by nine dominant maltreatment profiles, including seven low maltreatment frequency configurations and two high maltreatment frequency configurations. Importantly, there was variation between these configurations with regards to mean offending rates, suggesting that some configurations of substantiated maltreatment were associated with a higher rate of offending than others amongst maltreated Indigenous males.

Within these nine configurations representing maltreated Indigenous males, there were five configurations with a higher than average (50.8%) proportion of offenders. Each of these five configurations with an above average proportion of offenders, were characterised by maltreatment substantiations which continued into adolescence (configurations 73 and 74) or began in adolescence (configurations 68, 75, and 53). The remaining four configurations with a lower than average proportion of offenders, were characterised by maltreatment substantiations that ceased prior to adolescence (configurations 24, 43, 64, and 54). These observations indicate the importance of maltreatment timing to offending outcomes amongst maltreated Indigenous males.

In chronic, high substantiation frequency configurations (configurations 73 and 74), the addition of emotional abuse substantiations to neglect and physical abuse substantiations, appeared to be associated with a proportion of offenders. This may indicate that the experience of multiple maltreatment types increases risk in chronic, high frequency configurations, or alternatively may indicate the unique contribution of emotional abuse. The absence of additional multi-type, high frequency configurations prevents further examination of this possibility. However, it does appear that an isolated substantiation of neglect during adolescence (configuration 68), was associated with a higher proportion of offenders than the above described chronic, multi-type maltreatment configurations characterised by substantiated neglect, and physical abuse (configuration 74), and neglect, physical abuse and emotional abuse (configuration 73). Additionally, an isolated substantiation of emotional abuse in adolescence (configuration 75) was associated with a consistent proportion of offenders to a chronic configuration of neglect and physical abuse (configuration 74), but a lesser proportion of offenders than chronic emotional abuse, neglect and physical abuse (configuration 73). These comparisons of configurations may indicate the greater impact of some
maltreatment types compared to others. Of course, it is impossible to determine the extent to which configurations of maltreatment substantiations match lived experiences.

Amongst configurations in which a single maltreatment substantiation was recorded in adolescence, the greatest proportion of offenders was associated with neglect (configuration 68), followed by emotional abuse (configuration 75), and physical abuse (configuration 53). Similarly, when a single event of maltreatment was substantiated in middle childhood, the greatest proportion of offenders was associated with neglect (configuration 43), followed by physical abuse (configuration 64). However, when a single substantiation of maltreatment occurred in early childhood, the greatest proportion of offenders was associated with physical abuse (configuration 54), followed by neglect (configuration 24). These results indicate that the impact of each maltreatment type on offending may be affected by the age at which the maltreatment occurs.

These results regarding the differential impact of maltreatment types during different developmental periods may assist in explaining the earlier difficulties in interpretation of the impact of multiple maltreatment types in chronic, high frequency configurations. Specifically, for cases of chronic, multi type maltreatment, the data produced by this CACC does not allow clear identification of the developmental period in which each distinct maltreatment type occurred. Rather, the figures produced here simply identify that across the life-course, individuals in the configuration had substantiations for multiple maltreatment types, and substantiated maltreatment events in multiple developmental periods, but the timing of each distinct substantiated maltreatment type is unknown.

Taken together, the above observations indicate that a higher than average proportion of maltreated Indigenous males will offend if maltreatment is substantiated in adolescence, regardless of maltreatment type. However, the proportion of offenders is highest in configurations with substantiated adolescent neglect, followed by emotional abuse and physical abuse. Interestingly, a lower than average proportion of Indigenous males offended in configurations where maltreatment substantiations ceased prior to adolescence. It is unclear if this is because maltreatment actually ceased, or because an alternative intervention or turning point occurred. Nonetheless, the impact of each
maltreatment type appeared to vary according to the developmental period in which it was substantiated.

It is important to note here that there was an absence of dominant maltreatment configurations representing the experience of sexual abuse. This does not suggest that Indigenous males are never sexually abused. Rather, this result suggests that the experience of sexual abuse does not typically occur within dominant maltreatment configurations for Indigenous males. Hence, the impact of sexual abuse on offending by Indigenous males cannot be determined here. Similarly, due to a lack of comparative configurations, the impact of maltreatment frequency could not be fully examined here.

Overall, the highest rate of offending by Indigenous males was evident in cases with an isolated substantiation of neglect in adolescence, and for chronic life-course maltreatment, characterised by neglect, physical abuse and emotional abuse. Importantly, figures from Allard et al. (2010) indicate that 35.08% of the overall population of Indigenous males born 1990 offended. Hence, in all but one configuration (configuration 24), maltreated Indigenous males offended at a higher rate than Indigenous males in the general population. The only maltreatment configuration with a lower proportion of offenders that this general population average (35.08%) was characterised by a single substantiation of neglect in early childhood. This may indicate the limited impact of early childhood neglect on offending, or alternatively may represent the impact of particular child protection actions, among other factors. Clearly, the above observations must be balanced with future qualitative research to fully understand the processes underlying these observed trends.

7.3.2.3.2 Maltreatment configurations of Indigenous females.

Seven configurations representing dominant maltreatment profiles for Indigenous female youths are presented in Table 7.9.
Table 7.9

*Indigenous females compared according to maltreatment timing, type and frequency and overall proportion of offenders.*

<table>
<thead>
<tr>
<th>Config.</th>
<th>Indigenous</th>
<th>Sex</th>
<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
<th>Offended (M)</th>
<th>N</th>
<th>% of Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Early</td>
<td>Middle</td>
<td>Adolescence</td>
<td>Neglect</td>
<td>Emotional</td>
<td>Physical</td>
</tr>
<tr>
<td>34</td>
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<td>Female</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>46</td>
<td>Yes</td>
<td>Female</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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</tr>
<tr>
<td>70</td>
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<td>Female</td>
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<td>No</td>
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<tr>
<td>77</td>
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<tr>
<td>49</td>
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<td>Yes</td>
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</tr>
<tr>
<td>61</td>
<td>Yes</td>
<td>Female</td>
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<td>No</td>
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<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>38</td>
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<td>Female</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
As shown in Table 7.9, there were six low and one moderate maltreatment frequency configurations. As reported earlier in this thesis, 13.4% of the overall population of Indigenous females born in 1990 offended, compared to 32.6% of maltreated females. As demonstrated by Table 7.9, in all but one configuration (configuration 46), females with substantiated events of maltreatment offended at a higher proportion than the general population of Indigenous females born 1990. This low offending configuration was characterised by a single substantiation of physical abuse in early childhood. As argued earlier in discussion of offending by maltreated Indigenous males, this may indicate a reduced impact on offending by this maltreatment type or timing, or may alternatively represent the impact of a particular child protection intervention. Again, qualitative data may enhance understanding of these observations.

Compared to the average rate of offending amongst maltreated Indigenous females (32.6%), there were three configurations with an above average proportion of offenders (configurations 77, 49, and 38), and four with a below average proportion of offenders (configurations 34, 46, 70, and 61) (though configuration 34 was only slightly below average). In a similar pattern observed for Indigenous males, each of these high offending configurations were characterised by substantiated adolescent maltreatment. One additional configuration had substantiated adolescent maltreatment (configuration 61), but had a lower than average proportion of offenders. This configuration had an isolated substantiation of emotional abuse in adolescence. This may indicate an interrelated impact of maltreatment timing and type. Specifically, a single substantiation of adolescent physical abuse (configuration 38) was associated with a higher proportion of offenders than a single substantiation of adolescent neglect (configuration 49) or emotional abuse (configuration 61). As an aside, the association between substantiated adolescent neglect on offending appeared stronger when maltreatment substantiations occurred at a moderate frequency compared to a low frequency. Due to a lack of additional comparative configurations, the effect of maltreatment frequency for other maltreatment types could not be examined further here.

An alternative impact of maltreatment types was observed for early childhood limited maltreatment. Specifically, an isolated substantiation for neglect in early childhood (configuration 4), was associated with a higher proportion of offenders than an isolated substantiation of physical abuse in early childhood (configuration 46). There was only one dominant middle childhood configuration for Indigenous females
This configuration allowed examination of the association between neglect and offending across developmental periods. Specifically, the highest proportion of female Indigenous offenders was associated with neglect in adolescence (configuration 49), followed by early childhood (configuration 34) and middle childhood (configuration 70), respectively. Likewise, physical abuse in adolescence (configuration 38) was associated with a higher rate of offending than physical abuse in early childhood (configuration 46). Again, these observations indicate the potential importance of adolescent maltreatment to offending amongst Indigenous females.

All but one configuration (configuration 46) had a higher proportion of offenders than the average for the overall sample of maltreated young people (15.7%). Furthermore, this configuration, characterised by an isolated substantiation of early childhood physical abuse, was the only one which was associated with a lower than average rate of offenders compared to the general population of Indigenous females born 1990 (13.42%). This indicates that almost all dominant maltreatment configurations were associated with a higher risk of offending amongst Indigenous females. Overall, the highest rate of offending by Indigenous females was observed in configurations representing isolated substantiations of adolescent neglect, and isolated substantiations of adolescent physical abuse.

Taken together, the above observations indicate that adolescent maltreatment is associated with a higher proportion of Indigenous females who offend, but there is a relationship between maltreatment timing and type. Specifically, a higher than average proportion of Indigenous female offenders was observed in configurations in which maltreatment substantiations occurred in adolescence, unless the maltreatment type was emotional abuse. Furthermore, it is possible that an increased frequency of maltreatment may be associated with a higher proportion of Indigenous female offenders, though this observation is restricted to a single configuration pairing. Due to a lack of additional comparative configurations, the association between emotional abuse and offending by Indigenous females could not be further examined here. Likewise, due to a lack of dominant maltreatment configurations in which sexual abuse was substantiated, the association between sexual abuse and offending by Indigenous females could not be determined here. Lastly, considering earlier observations regarding the reduced impact of early childhood maltreatment, the relatively high rate of offending amongst Indigenous females with substantiated neglect in early childhood (configuration 34)
may warrant further attention, particularly as this indicates an opposite association compared to Indigenous males. To extend beyond the above observations, the next section examines the potential impact of gender on maltreatment and offending links among Indigenous youths.

7.3.2.3.3 The impact of gender on observed maltreatment and offending links among Indigenous Australian youths: Comparison of offending outcomes for Indigenous males compared to Indigenous females with identical configurations.

To further explore the impact of sex on observed relationships between maltreatment dimensions and offending by Indigenous males and females, paired configurations were located for Indigenous males and females. Table 7.10 lists six pairs of configurations.
### Table 7.10

Comparison of offending proportions for Indigenous males and females with otherwise identical configurations

<table>
<thead>
<tr>
<th>Config.</th>
<th>Indigenous</th>
<th>Sex</th>
<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
<th>Offended</th>
<th>N</th>
<th>% of Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Early</td>
<td>Middle</td>
<td>Adolescence</td>
<td>Neglect</td>
<td>Emotional</td>
<td>Physical</td>
</tr>
<tr>
<td>34</td>
<td>Yes</td>
<td>Female</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>24</td>
<td>Yes</td>
<td>Male</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
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</tr>
<tr>
<td>70</td>
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<td>Yes</td>
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<td>Yes</td>
<td>No</td>
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</tr>
<tr>
<td>43</td>
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<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>49</td>
<td>Yes</td>
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<td>Yes</td>
<td>No</td>
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</tr>
<tr>
<td>68</td>
<td>Yes</td>
<td>Male</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>61</td>
<td>Yes</td>
<td>Female</td>
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<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>75</td>
<td>Yes</td>
<td>Male</td>
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<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>46</td>
<td>Yes</td>
<td>Female</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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</tr>
<tr>
<td>54</td>
<td>Yes</td>
<td>Male</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>38</td>
<td>Yes</td>
<td>Female</td>
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<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>53</td>
<td>Yes</td>
<td>Male</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Across all pairs except one (configurations 34 and 24), a much higher proportion of males engaged in offending than females, despite identical maltreatment substantiation configurations. The single configuration pairing in which females engaged in offending at a higher proportion than males, was characterised by substantiated early childhood neglect, though the average proportion of offenders was below average for both males and females in this configuration pair. Without additional data, it is not possible to determine why there is an increased association between early childhood neglect and offending by Indigenous females compared to Indigenous males. It is possible that this result reflects an alternative child protection response for these females, but this cannot be investigated or confirmed here.

In addition to the above, in one configuration pair (configurations 61 and 75), despite the offending proportion being above average for the Indigenous males (50.8%), it was below average for Indigenous females (32.6%). This configuration pairing indicates that emotional abuse in adolescence is associated with offending more so amongst Indigenous males than Indigenous females. This trend was almost also the case for an additional configuration pair (configurations 70 and 43), highlighting a differential association between substantiated middle childhood neglect amongst Indigenous males compared to females. This gendered impact of substantiated early childhood and middle childhood neglect, and adolescent emotional abuse amongst Indigenous females and males warrants additional attention in future research.

The next point of focus in this chapter is identification of the unique impact of maltreatment dimensions on offending by non-Indigenous Australian youths. Based on the above identification of gender differences between Indigenous males and females, non-Indigenous males and females are examined separately.

7.3.2.4 Unique impact of maltreatment dimensions for non-Indigenous Australian youths.

Consistent with the above approach taken for Indigenous males and females, comparisons of configurations are presented in separate tables for non-Indigenous males and females. However, due to the large number of configurations pertaining to maltreatment experiences of non-Indigenous males and females, separate tables are presented to account for the unique associations between each maltreatment dimension.
and offending outcomes. Maltreatment configurations for non-Indigenous females are examined first. The maltreatment dimensions are examined one-by-one. The associations between maltreatment timing and offending are examined first, followed consecutively by maltreatment type, frequency, multi-type maltreatment, and chronicity. This same process is then followed for maltreatment configurations of non-Indigenous males. Following this separate examination of non-Indigenous females and males, the observed general patterns for non-Indigenous males and females are compared to explore the impact of gender on observed maltreatment and offending links among non-Indigenous youths.

7.3.2.4.1 The impact of maltreatment timing on offending by non-Indigenous females.

Table 7.11 presents configuration pairings which demonstrate the association between maltreatment timing and offending by non-Indigenous females.
Table 7.11

Matched configuration pairs for non-Indigenous females, indicating unique contribution of maltreatment timing

<table>
<thead>
<tr>
<th>Config.</th>
<th>Indigenous</th>
<th>Sex</th>
<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
<th>Offended</th>
<th>N</th>
<th>% of Population</th>
</tr>
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</table>
Amongst non-Indigenous females, across all maltreatment types except sexual abuse (configurations 27, 21, and 6) substantiated adolescent maltreatment was associated with a higher proportion of offenders than maltreatment substantiations which ceased prior to adolescence. Specifically, except for sexual abuse, as the age at maltreatment substantiation increased, so too did the proportion of offenders.

As observed earlier, approximately 1.4% of the general population of non-Indigenous females offended, compared to approximately 7.4% of maltreated non-Indigenous females. As illustrated in Table 7.11, only five configurations (configurations 21, 15, 19, 40, 63 and 88) were associated with a rate of offending lower than the overall sub-population average. Each of these configurations reflected maltreatment substantiations that were restricted to early childhood, with the exception of one configuration (configuration 21) which reflected substantiated sexual abuse in middle childhood. It is not possible to identify here, whether this result is associated with child protection interventions.

Additionally, as shown in Table 7.11, when maltreatment substantiation occurred at a low frequency, regardless of timing or type, offending by non-Indigenous maltreated females was lower than the maltreated sub-group average (7.4%). The timing of maltreatment did appear to be associated with the rate of offending by maltreated non-Indigenous females compared to the average for the overall population of non-Indigenous females (1.4%), particularly when maltreatment type was also considered. Specifically, substantiated sexual abuse in early childhood (configuration 27) and adolescence (configuration 6) was associated with a slightly higher proportion of offenders, but substantiated middle childhood sexual abuse was not (configuration 21). Across physical abuse (configurations 15, 13, and 1) and emotional abuse (configurations 19, 17, and 2), middle childhood and adolescent maltreatment substantiations were associated with a higher proportion of offenders, but early childhood maltreatment substantiations were not. Finally, substantiated neglect at any age (configurations 12, 14, and 5) was associated with a higher proportion of offenders amongst maltreated non-Indigenous females compared to the overall population of non-Indigenous females (1.4%).

When maltreatment was substantiated at a moderate frequency, emotional abuse in middle childhood and adolescence (configurations 85 and 18) was associated with a
higher than average proportion of offenders than the maltreated sub-group average (7.4%). Similarly, a moderate frequency of neglect substantiations in middle childhood and adolescence (configurations 36 and 23), were associated with a higher than average proportion of offenders, yet a moderate frequency of early childhood neglect substantiations was not (configuration 40).

Consistent associations between timing and offending were also identified for some cases of substantiated multi-type maltreatment. Specifically, substantiated neglect and physical abuse in adolescence (configuration 32) was associated with an above average proportion of offenders, while these same maltreatment types substantiated in early childhood (configuration 63) were not. Likewise, substantiated neglect and emotional abuse in adolescence (configuration 28) was associated with a higher than average proportion of offenders, while these same maltreatment types substantiated in early childhood (configuration 88) were not.

Taken together, the above results indicate that, with the exception of sexual abuse, the risk of offending amongst non-Indigenous females increases alongside the age at which substantiations occur. However, the additional association between maltreatment type and frequency and offending requires further examination in relation to these observations. Based on the above observations, it appears that maltreatment is associated with a higher proportion of offending amongst non-Indigenous females when it is substantiated at a moderate frequency, and is substantiated in middle childhood or adolescence, particularly for neglect, physical abuse or emotional abuse. There were no moderate frequency sexual abuse configurations for non-Indigenous females to enable further consideration of this maltreatment type.

7.3.2.4.2 The impact of maltreatment type on offending by non-Indigenous females.

Table 7.12 presents matched configuration pairs indicating the unique association between each maltreatment type and offending by non-Indigenous females. The figures presented in Table 7.12 indicate that the association between each maltreatment type and offending varies according to the developmental period in which maltreatment is substantiated.
Table 7.12

*Matched configuration pairs for non-Indigenous females, indicating unique contributions of single maltreatment types*

<table>
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<tr>
<th>Config</th>
<th>Indigenous</th>
<th>Sex</th>
<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
<th>Offended</th>
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<th>% of Population</th>
</tr>
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</tbody>
</table>

223
As indicated by the figures in Table 7.12, when maltreatment substantiations are restricted to a single substantiation in early childhood, the maltreatment type which is associated with the highest rate of offending is neglect, followed by sexual abuse and physical abuse, with emotional abuse associated with no offenders. When maltreatment substantiations are restricted to a single substantiation in middle childhood, the maltreatment type which is associated with the highest rate of offending is neglect, followed by physical abuse, emotional abuse, with sexual abuse associated with no offenders. This pattern was altered when maltreatment was substantiated at a moderate frequency, whereby emotional abuse was associated with a slightly higher proportion of offenders than neglect. Lastly, when maltreatment substantiations were restricted to a single substantiation in adolescence, an equal highest rate of offending was associated with neglect, emotional abuse, and physical abuse, with sexual abuse associated with a lower rate of offending. Again, the association between maltreatment types and offending was altered when maltreatment was substantiated at a moderate frequency. Specifically, when maltreatment was substantiated at a moderate frequency in adolescence, the highest rate of offending was associated with neglect, followed by emotional abuse and physical abuse, respectively, with sexual abuse associated with no offenders.

Taken together, the above observations indicate that maltreatment types have a differential relationship with offending, which is associated with both the timing and frequency of maltreatment substantiations. Again, compared to average offending rates of maltreated non-Indigenous females, the greatest risk is associated with moderate maltreatment substantiations in middle childhood or adolescence, with the highest proportion of offenders noted in configurations with substantiated adolescent neglect.

7.3.2.4.3 The impact of maltreatment frequency on offending by non-Indigenous females.

Thus far, examinations of maltreatment configurations for non-Indigenous females indicate that maltreatment frequency (particularly when considered alongside maltreatment timing) is associated with increased offending among non-Indigenous females. Table 7.13 presents nine pairs of configurations, which allow additional
examination of the association between maltreatment frequency and offending by non-Indigenous females.
Table 7.13

Matched configuration pairs for non-Indigenous females, indicating unique contributions of maltreatment frequency

<table>
<thead>
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<th>Config.</th>
<th>Indigenous</th>
<th>Sex</th>
<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
<th>Offended</th>
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<th>% of Population</th>
</tr>
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Of the nine configuration pairs presented in Table 7.13, six indicate that the proportion of offenders increases alongside the frequency of maltreatment substantiations. However, three configuration pairs (62-6, 20-1, and 40-12) indicate the reverse pattern. Importantly, across these three configuration pairs, the difference between the mean rate of offending for each was relatively small, and may not be statistically significant. Furthermore, there was no absolute consistency across these three configuration pairs with regards to maltreatment timing or type.

In addition to the above, the final configuration pair (72 and 78) presented in the table depicted chronic maltreatment and multi-type maltreatment. Though this comparison indicated a higher proportion of offenders associated with a higher frequency of maltreatment, as previously argued, comparison of multiple maltreatment types across multiple developmental periods is very difficult because the exact timing of each maltreatment type is unknown. As explained earlier, all that is known is that multiple types were substantiated and substantiations were recorded in multiple developmental periods, but the exact timing of each distinct maltreatment type in these configurations cannot be identified here. Further, as argued previously, child protection interventions amongst these configurations are unknown, meaning that the impact of maltreatment frequency may also be affected by intervention decisions and actions.

Taken together, the slightly inconsistent results presented here indicate the potential importance of maltreatment frequency for offending by non-Indigenous females, yet also highlight the need for caution when drawing general conclusions. Again, these observations highlight the need for additional research, particularly using mixed methods which allow greater insight into lived experiences.

7.3.2.4.4 The impact of multiple maltreatment types on offending by non-Indigenous females.

Table 7.14 presents matched configuration pairs in an attempt to identify the unique associations between multiple maltreatment types and rates of offending amongst non-Indigenous females.
Table 7.14

**Matched configuration pairs indicating the combined impact of multiple maltreatment types**

<table>
<thead>
<tr>
<th>Config.</th>
<th>Indigenous Sex</th>
<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
<th>Offended</th>
<th>N</th>
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</tbody>
</table>
Overall, of the association between multiple maltreatment types and offending appears to vary. When a moderate frequency of maltreatment substantiations was restricted to early childhood, no offending occurred when neglect was the only substantiation (configuration 40), or substantiated alongside emotional abuse (configuration 88), or physical abuse (configuration 63). Alternatively, when a moderate frequency of maltreatment substantiations was restricted to adolescence, substantiated emotional and physical abuse together (configuration 25) was associated with a greater proportion of offenders compared to when emotional abuse (configuration 18) and physical abuse (configuration 20) were substantiated in isolation.

A greater proportion of individuals offended in configurations where adolescent emotional abuse was substantiated alongside neglect (configuration 28), than when emotional abuse was substantiated in isolation (configuration 18). Similarly, neglect and physical abuse substantiated together in adolescence (configuration 32) was associated with a higher proportion of offenders than physical abuse substantiated alone (configuration 20). Likewise, sexual abuse and neglect substantiated together in adolescence (configuration 67) was associated with a higher proportion of offenders than sexual abuse substantiated in isolation (configuration 62). Importantly, amongst these configuration pairings, the association between an isolated substantiation of neglect and offending is unknown. Hence, in some cases the additional proportion of offenders may simply reflect the unique association between offending and neglect in adolescence.

For the remaining configuration pairings in Table 7.14, maltreatment experiences were chronic. When maltreatment substantiations occurred across middle childhood and adolescence at a moderate frequency, the proportion of offenders was higher in configurations where emotional abuse was substantiated alongside neglect (configuration 66) or physical abuse (configuration 57), compared to when emotional abuse was substantiated in isolation (configuration 84). Interestingly, in this same category, neglect and physical abuse substantiated together (configuration 72) were associated with no offending. Similarly, when maltreatment was substantiated at a high frequency across middle childhood and adolescence, neglect and physical abuse substantiated together (configuration 78) was associated with a higher rate of offending than these two maltreatment types substantiated alongside emotional abuse (configuration 42). Yet, emotional abuse substantiated alongside physical abuse...
(configuration 50) across the whole life-course, was associated with a higher proportion of offenders than emotional abuse substantiated alongside neglect (configuration 81).

As discussed earlier, it is likely that these results pertaining to chronic configurations are affected by the timing of each distinct maltreatment type, rather than accounting for combined impact of multiple maltreatment types. Hence, while CACC is effective in identifying the configurations in which multi-type maltreatment was substantiated, the unique impact of the experience of multiple maltreatment types on offending compared to single maltreatment types is difficult to determine, because the exact timing of each maltreatment type, particularly for chronic maltreatment groups, is unknown. In particular, for these configurations, all that is known is that multiple types were substantiated, and that substantiations were recorded in multiple developmental periods.

Taken together, the above observations indicate that the associated between offending and multi-type maltreatment varies according to other maltreatment dimensions such as timing and type. The data obtained here from this CACC, was unable to conclusively indicate the unique impact of multiple maltreatment types in most instances, with the exception of some results suggesting that in adolescence, higher offending rates are associated with the experience of multi-type maltreatment compared to single maltreatment types, particularly in relation to substantiated emotional and physical abuse (configurations 20, 18, and 25).

7.3.2.4.5 The impact of maltreatment chronicity on offending by non-Indigenous females.

Table 7.15 presents multiple configuration pairs in an attempt to identify the unique associated between maltreatment chronicity and offending amongst non-Indigenous girls.
Table 7.15

*Matched configuration pairs for non-Indigenous females, indicating unique contribution of maltreatment chronicity*

<table>
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<tr>
<th>Config.</th>
<th>Indigenous</th>
<th>Sex</th>
<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
<th>Offended</th>
<th>N</th>
<th>% of Population</th>
</tr>
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<tr>
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<td>Adolescence</td>
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<td>Physical</td>
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Overall, the results indicate that maltreatment chronicity has a less consistent association with offending than maltreatment timing and type. Specifically, when maltreatment substantiations were restricted to emotional abuse, there was very little change in rates of offending when maltreatment was substantiated in adolescence alone (configuration 18), compared to middle childhood alone (configuration 85), or was chronic across both middle childhood and adolescence (configuration 84). Likewise, when maltreatment substantiations included both emotional abuse and physical abuse, there was no increase in offending proportions when the maltreatment was chronic across middle childhood and adolescence (configuration 57), compared to when substantiations were restricted to adolescence (configuration 25).

When a moderate frequency of substantiations for neglect and emotional abuse occurred chronically across middle childhood and adolescence (configuration 66), the proportion of offenders was slightly higher than when these substantiations were restricted to adolescence (configuration 28). Yet, when a high frequency of neglect and emotional abuse substantiations was experienced chronically across the life-course (configuration 81), the proportion of offending was lower than when these substantiations were restricted to adolescence (configuration 60).

Again, these results are likely to be attributable, at least in part, to the unknown timing of each maltreatment type. As argued earlier, with the exception of the configuration pairing relating to substantiated emotional maltreatment isolated in adolescence (configuration 18), substantiated emotional maltreatment isolated to middle childhood (configuration 85), and emotional maltreatment substantiated chronically across adolescence and middle childhood (configuration 84), the unique association between offending and maltreatment chronicity was difficult to determine. As with the impact of multi-type maltreatment, while CACC is useful in identifying affected configurations, the available data here cannot lead to effective conclusions regarding its impact on offending. In particular, there were small sample sizes in these contingency groups, and no indication of the statistical significance of observed links.
7.3.2.4.6 The impact of maltreatment timing on offending by non-Indigenous males.

Following on from the focus on non-Indigenous females in preceding sections, in the following sections the focus is on non-Indigenous males. Table 7.16 presents maltreatment configurations for non-Indigenous males, which illustrate the association between maltreatment timing and offending for non-Indigenous males.
Table 7.16 Matched configuration pairs for non-Indigenous males indicating the unique contribution of maltreatment timing

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<th>Frequency</th>
<th>Offended</th>
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As indicated in Table 7.16, with the exception of low frequency substantiations of physical abuse (configurations 11, 9 and 3), all low frequency substantiation configuration pairings indicated that maltreatment in adolescence, regardless of type, was associated with a higher rate of offending than maltreatment that ceased prior to adolescence. A consistent pattern was identified for moderate frequency substantiations of neglect, as well as for multi-type maltreatment (configuration pairs 65-82 and 41-52).

Exceptions to the above patterns were identified for low frequency substantiations of physical abuse, and moderate frequency substantiations of emotional abuse. Specifically, for low frequency physical abuse substantiations, early childhood substantiations (configuration 11) was associated with a higher proportion of offending than adolescent maltreatment (configuration 3), with middle childhood (configuration 9) physical abuse associated with the lowest proportion of offenders. Alternatively, for moderate frequency maltreatment, middle childhood emotional abuse substantiations (configuration 56) were associated with slightly more offenders than adolescent emotional abuse (configuration 22), though the difference here was very small, and may not have been statistically significant. Lastly, the moderate frequency, multi-type maltreatment experience of emotional abuse and physical abuse substantiations in adolescence (configuration 30) was associated with an equal proportion of offenders as these maltreatment types substantiated in middle childhood (configuration 80), while these same maltreatment types substantiated in early childhood (configuration 87) were associated with no offenders.

In conjunction with maltreatment type and frequency, the timing of maltreatment did appear to be associated with offending rates amongst maltreated non-Indigenous males. As discussed earlier the average rate of offending amongst maltreated non-Indigenous males was approximately 16%. Maltreated non-Indigenous males generally offended above this rate in configurations where neglect was substantiated in adolescence, regardless of its frequency (configurations 7 and 35), yet neglect substantiated in earlier developmental periods was associated with a below average proportion of offenders (configurations 8, 10, 39, and 33). Similarly, a moderate frequency of maltreatment substantiations during adolescence was consistently associated with a higher than average proportion of offenders regardless of maltreatment type (configurations 22, 30, 35, 65 and 41), while these same experiences
in early and middle childhood were associated with less consistent offending outcomes (configurations 80, 87, 39, 33, 82, and 52).

Compared to the aforementioned average proportion of offenders in the general population of non-Indigenous males (4.3%), maltreatment substantiations in adolescence, regardless of type or frequency, were always associated with increased rates of offending (configurations 31, 3, 4, 7, 22, 30, 35, 65 and 41). In fact, with the exception of sexual abuse substantiations in early and middle childhood (configuration 47 and 55), a moderate frequency of neglect substantiated in early childhood (configuration 87), and early childhood limited combined substantiations of physical and emotional abuse (configuration 87), all maltreatment substantiations were associated with an above average proportion of offending (4.3%) amongst non-Indigenous males.

Overall, these results indicate that amongst non-Indigenous males, maltreatment substantiated in adolescence is typically associated with a greater risk for offending than maltreatment substantiations that ceased prior to adolescence. However, the mild variations noted above indicate that the association between maltreatment timing and offending amongst maltreatment non-Indigenous males may be affected by maltreatment type and frequency.

7.3.2.4.7 The impact of maltreatment type on offending by non-Indigenous males.

Table 7.17 includes matched configuration pairs which explore the unique associated between distinct maltreatment types and offending by non-Indigenous males.
Table 7.17

Matched configuration pairs for non-Indigenous males, indicating the unique impact of single maltreatment types

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<th>Config.</th>
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<th>Frequency</th>
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<th>% of Population</th>
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</table>
As demonstrated above, and as illustrated by Table 7.17, rates of offending vary across configurations of different maltreatment types, though the links between these variables are likely affected by other maltreatment dimensions. Specifically, when maltreatment substantiations were restricted to a single substantiation in early childhood, the maltreatment type which was associated with the highest rate of offending was physical abuse (configuration 11), followed by neglect (configuration 10) and emotional abuse (configuration 26). Configurations of substantiated sexual abuse in this developmental period did not contain any offenders (configuration 47). When maltreatment substantiations were restricted to a single substantiation in middle childhood, the maltreatment type which was associated with the highest rate of offending was neglect (configuration 8), followed equally by physical abuse (configuration 9) and emotional abuse (configuration 16). Again, configurations of substantiated sexual abuse contained no offenders (configuration 55). Contrarily, when maltreatment was substantiated at a moderate frequency in middle childhood, the largest proportion of offenders was associated with emotional abuse (configuration 56), followed by physical abuse (configuration 45) then neglect (configuration 39), though this difference between physical abuse and neglect was small. There was no moderate middle childhood sexual abuse configuration to examine for this group. Interestingly, when maltreatment substantiations were chronic across early and middle childhood, physical abuse (configuration 76) was associated with a higher proportion of offenders than neglect (configuration 86). Lastly, when maltreatment substantiations were restricted to a single substantiation in adolescence, the maltreatment type which was associated with the highest rate of offending was neglect (configuration 7), followed by emotional abuse (configuration 4), and then equal proportions for physical (configuration 3) and sexual abuse (configuration 31). Clearly, maltreatment timing appears to be associated with variations in the associations between particular maltreatment types and offending.

Across the configurations presented in Table 7.17, the only maltreatment configurations which was associated with an above average rate of offending compared to average rates of offending for maltreated non-Indigenous males (16%), were characterised by a moderate rate of substantiations of emotional abuse in middle childhood (configuration 56), and a moderate rate of chronic physical abuse substantiations in early and middle childhood (configuration 76). These results vary
from the overall pattern reported in the preceding section of this chapter, with regards to
the overall association between maltreatment timing and offending, particularly
regarding adolescent substantiations. Importantly though, compared to the average rate
of offending for the general population of non-Indigenous males (4.3%), all
maltreatment substantiations except for sexual abuse in early and middle childhood,
were associated with increased rates of offending amongst maltreated non-Indigenous
males.

Taken together, the above results indicate that the association between
maltreatment types and rates of offending vary according to the developmental period in
which substantiations occur. Generally, sexual abuse appears to share the smallest
relationship with offending. Within each developmental period, sexual abuse
substantiations were consistently associated with the lowest proportion of offenders. In
fact, adolescence was the only period in which sexual abuse appeared to be associated
with an increase offending (configuration 31). This result is perhaps a greater indicator
of the association between offending and maltreatment timing than type. The remaining
maltreatment types showed varying associations with offending, and were seemingly
associated with timing, and frequency.

7.3.2.4.8 The impact of maltreatment frequency on offending by non-Indigenous
males.

Eight configuration pairs are presented in Table 7.18 to further examine the
unique associations between maltreatment frequency and offending rates amongst non-
Indigenous males.
Table 7.18

Matched configuration pairs for non-Indigenous males, indicating unique contributions of maltreatment frequency

<table>
<thead>
<tr>
<th>Config.</th>
<th>Indigenous</th>
<th>Sex</th>
<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
<th>Offended</th>
<th>N</th>
<th>% of Population</th>
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<td></td>
<td></td>
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<td>Physical</td>
<td>Sexual</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>No</td>
<td>Male</td>
<td>Yes     No          No          Yes      No      No      No      Moderate 0.04 27 0.6</td>
<td></td>
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</tr>
<tr>
<td>10</td>
<td>No</td>
<td>Male</td>
<td>Yes     No          No          Yes      No      No      No      Moderate 0.09 102 2.28</td>
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</tr>
<tr>
<td>39</td>
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<td>Male</td>
<td>No      Yes         No          Yes      No      No      No      Moderate 0.05 21 0.47</td>
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<tr>
<td>8</td>
<td>No</td>
<td>Male</td>
<td>No      Yes         No          Yes      No      No      No      Moderate 0.11 103 2.3</td>
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</tr>
<tr>
<td>56</td>
<td>No</td>
<td>Male</td>
<td>No      No          Yes         No      Yes     No      No      Moderate 0.21 14 0.31</td>
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<tr>
<td>16</td>
<td>No</td>
<td>Male</td>
<td>No      No          Yes         No      Yes     No      No      Moderate 0.08 72 1.61</td>
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<td>29</td>
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<td>Male</td>
<td>No      No          Yes         No      No      Yes     No      Moderate 0.16 32 0.71</td>
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<tr>
<td>3</td>
<td>No</td>
<td>Male</td>
<td>No      No          Yes         No      No      Yes     No      Moderate 0.10 163 3.64</td>
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<tr>
<td>45</td>
<td>No</td>
<td>Male</td>
<td>No      Yes         No          No      No      Yes     No      Moderate 0.06 17 0.38</td>
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<tr>
<td>9</td>
<td>No</td>
<td>Male</td>
<td>No      No          Yes         No      No      Yes     No      Moderate 0.08 103 2.3</td>
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<tr>
<td>48</td>
<td>No</td>
<td>Male</td>
<td>No      No          Yes         Yes     Yes     Yes     No      High 0.44 16 0.36</td>
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<td>Male</td>
<td>No      No          Yes         Yes     Yes     Yes     No      Moderate 0.35 20 0.45</td>
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<tr>
<td>22</td>
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<td>Male</td>
<td>No      No          Yes         No      Yes     No      No      Moderate 0.20 46 1.03</td>
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<tr>
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<td>No</td>
<td>Male</td>
<td>No      No          Yes         Yes     No      No      No      Moderate 0.21 24 0.54</td>
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</tr>
<tr>
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<td>No</td>
<td>Male</td>
<td>No      No          Yes         Yes     No      No      No      Moderate 0.18 106 2.37</td>
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As shown in Table 7.18, five of the eight pairings indicate that rates of offending increase as frequency of maltreatment increases (configuration pairs 56-16, 29-3, 48-41, 22-4, and 35-7). Alternatively, three pairings depict an opposite impact, where a lower frequency was associated with a higher proportion of offenders (configuration pairs 33-10, 39-8, and 45-9). Again, some of these differences were small, and may not be statistically significant.

In all configurations in which maltreatment was substantiated in adolescence, regardless of maltreatment type, the proportion of offenders increased as maltreatment frequency increased (configuration pairs 29-3, 48-1, 22-4, and 35-7). Contrarily, the association between offending and maltreatment frequency varied. This variation may be attributable to associations with maltreatment type. Specifically, the higher frequency of substantiations for emotional abuse in middle childhood was associated with a larger proportion of offenders (configuration pair 56-16), while a lower frequency of substantiations for neglect (configuration pair 39-8) and physical abuse (configuration pair 45-9) were associated with a greater proportion of offenders. These observations indicate some interplay between maltreatment, type, timing, and frequency. As argued earlier in this chapter, these results may also be affected by particular child protection actions, which may vary according to maltreatment type and timing. Again, without additional data, particularly qualitative data reflecting lived experiences of maltreatment and interventions, this possibility cannot be further explored here.

7.3.2.4.9 The impact of multiple maltreatment types on offending by non-Indigenous males.

Table 7.19 seeks to further examine the association between multi-type maltreatment and offending.
Table 7.19

**Matched configuration pairs for non-Indigenous males, indicating the combined impact of multiple maltreatment types**

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<th>Config.</th>
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<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
<th>Offended</th>
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<th>% of Population</th>
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As shown in Table 7.19, when maltreatment substantiations were chronic across the life-course, a higher proportion of young people offended in configurations with substantiations of neglect, emotional abuse and physical abuse (configuration 44) than for neglect and physical abuse alone (configuration 79). However, the chronic nature of these configurations does prevent identification of the potential unique contribution of each maltreatment type in each developmental period. When substantiated maltreatment was restricted to early childhood, substantiations for neglect in conjunction with physical abuse (configuration 51) were associated with a higher proportion of offenders than isolated neglect substantiations (configuration 33), yet, configurations of physical abuse substantiated in conjunction with emotional abuse in this developmental period contained no offenders (configuration 87).

Similar inconsistencies were identified for moderate frequency maltreatment substantiations in middle childhood. Specifically, emotional abuse substantiated in isolation (configuration 56) was associated with a higher proportion of offenders than substantiations of both emotional abuse and neglect (configuration 52), and an isolated substantiation of neglect (configuration 39). Yet, substantiations of both emotional abuse and physical abuse (configuration 80), were associated with a lower proportion of offenders than emotional abuse substantiated alone (configuration 56), but a higher proportion of offenders than physical abuse alone (configuration 45). Lastly, substantiations of both neglect and physical abuse (configuration 82), was associated with a higher proportion of offenders than isolated physical abuse (configuration 45), and isolated neglect (configuration 39).

When maltreatment substantiations were restricted to adolescence, substantiations of both neglect and emotional abuse (configuration 41), were associated with a higher proportion of offenders than neglect substantiated in isolation (configuration 35) and emotional abuse substantiated in isolation (configuration 22). Substantiations of both physical abuse and emotional abuse (configuration 30) were associated with a higher rate of offenders than physical abuse substantiated in isolation (configuration 29), but an equal proportion of offenders to emotional abuse substantiated in isolation (configuration 22). Substantiations of both neglect and physical abuse (configuration 65) were associated with a higher proportion of offenders than physical abuse substantiated alone (configuration 29) and neglect substantiated alone (configuration 35).
When maltreatment substantiations were chronic across early and middle childhood, neglect substantiated in isolation (configuration 86), was associated with an equal proportion of offenders as configurations with substantiations of both neglect and emotional abuse (configuration 83). Yet, when maltreatment substantiations were chronic across middle childhood and adolescence, physical abuse substantiated in isolation (configuration 69) was associated with a higher proportion of offenders than physical abuse substantiated alongside neglect (configuration 58). Yet, substantiations of both neglect and emotional abuse (configuration 59), were associated with a higher proportion of offenders than configurations with substantiations of both neglect and physical abuse (configuration 58).

Taken together, the above observations indicate a varying impact association between maltreatment chronicity and offending among maltreated non-Indigenous males. Though CACC was useful for identifying the configurations in which multiple maltreatment types were substantiated, the unique association between multi-type maltreatment and offending rates was difficult to determine. Overall, it appears that more consistent results are obtainable from examinations of associations between maltreatment types and timing, and offending by non-Indigenous males.

7.3.2.4.10 The impact of maltreatment chronicity on offending by non-Indigenous males.

Table 7.20 presents paired configurations in an effort to further investigate the unique associations between maltreatment chronicity and offending rates of non-Indigenous males.
Table 7.20

**Matched configuration pairs for non-Indigenous males, indicating unique contributions of maltreatment chronicity**

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<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
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<th>% of Population</th>
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<td>58</td>
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</tr>
<tr>
<td>37</td>
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<td>71</td>
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</tr>
<tr>
<td>44</td>
<td>No</td>
<td>Male</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

245
As shown in Table 7.20, when maltreatment substantiations were restricted to physical abuse, chronic maltreatment substantiations appeared to be associated with an increased proportion of offenders. Specifically, chronic physical abuse substantiations across middle childhood and adolescence (configuration 69) were associated with a higher proportion of offenders than when this maltreatment type was substantiated only in either adolescence (configuration 29) or middle childhood (configuration 45). Likewise, chronic physical abuse substantiations across early and middle childhood were associated with a higher proportion of offenders (configuration 76) than abuse substantiations restricted to middle childhood (configuration 45).

Similarly, neglect and emotional abuse substantiated chronically across middle childhood and adolescence (configuration 59) was associated with a higher proportion of offending than when these maltreatment types were substantiated only in either middle childhood (configuration 52) or adolescence (configuration 41). Likewise, these maltreatment types substantiated chronically across early and middle childhood were associated with a higher proportion of offenders (configuration 83) than when these substantiations were restricted to middle childhood (configuration 52). Again, when maltreatment substantiations was restricted to neglect, chronic substantiations of neglect and physical abuse in middle childhood and adolescence (configuration 86), were associated with a higher proportion of offenders than when these substantiations were restricted to either early (configuration 33) or middle (configuration 39) childhood.

The results were less clear for the remaining paired configurations reflecting multi-type maltreatment. Specifically, neglect and physical abuse substantiated together in adolescence (configuration 65), was associated with a higher proportion of offenders than when these types were substantiated chronically across middle childhood and adolescence (configuration 58). Yet, chronic substantiations of neglect and physical abuse in middle childhood and adolescence (configuration 58), were associated with a higher proportion of offending than when these maltreatment types were substantiated only in middle childhood (configuration 82). These results most likely indicate the combined impact of maltreatment type and timing on associations with offending, as opposed to chronicity, but this possibility cannot be explored further here.
Likewise, neglect, emotional abuse and physical abuse substantiated chronically across the life-course (configuration 44), was associated with a larger proportion of offenders than when chronic maltreatment substantiations ceased prior to adolescence (configuration 71). Alternatively, these life-course substantiations (configuration 44), were associated with a lower rate of offending than chronic substantiations occurring only in middle childhood and adolescence (configuration 37). Again, these results most likely indicate the combined impact of maltreatment type and timing on associations with offending, as opposed to chronicity. But without additional data, this possibility cannot be explored further here. As discussed earlier, the figures presented here can only confirm the presence or absence of these dimensions over the life-course, and not necessarily the exact combinations of these at any particular time.

7.3.2.4.11 The impact of gender on observed maltreatment and offending links among non-Indigenous Australian youths: Comparison of offending outcomes for non-Indigenous males compared to non-Indigenous females with identical configurations.

To assist with identification of gendered impacts of maltreatment dimensions amongst maltreated non-Indigenous youths, maltreatment configurations were paired to reflect identical maltreatment substantiation configurations, distinguishable by sex only. There were at least 25 identified configuration pairs which were suitable for comparison. As this number of configuration pairs cannot be clearly presented here, only those pairs which represent an atypical proportion of offenders are presented in Table 7.21. Specifically, as the offending rate for males was typically higher than for females, the configuration pairs which indicate an alternative balance of offending proportions across non-Indigenous males and females are presented in Table 7.21.

The six configuration pairs presented in Table 7.21 indicate gendered effects of some combinations of maltreatment dimensions. Specifically, adolescent emotional abuse substantiations were associated with an average rate of offending for non-Indigenous females but a below average proportion of offenders for males. Adolescent neglect substantiated at a low frequency, was associated with an average rate of offending by females but an above average rate of offending by males, while adolescent neglect substantiated at a moderate frequency was associated with above average rate of offending by males and a much higher than average rate of offending by females. Interestingly, neglect substantiated in middle
childhood at a moderate rate was associated with above average offending by females, but below average offending by males. This result indicates the importance of frequency for non-Indigenous young people, especially females, particularly when considered alongside type and timing. Sexual abuse in early childhood was associated with offending amongst females at a below sub-group average, but above general population average for non-Indigenous females. Yet this same maltreatment substantiation configuration contained no male offenders. Lastly, high frequency, life-course maltreatment substantiations of neglect, emotional abuse and physical abuse was associated with below average offending by females, but above average offending by males. Importantly, as discussed previously in this chapter, it is not possible to determine in which developmental period each distinct type was substantiated, meaning there may have been some variation across males and females in these configurations.
Table 7.21

Matched configuration pairs for non-Indigenous males and females that indicate atypical offending proportions associated with maltreatment dimensions

<table>
<thead>
<tr>
<th>Config.</th>
<th>Indigenous</th>
<th>Sex</th>
<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
<th>Offended</th>
<th>N</th>
<th>% of Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Early</td>
<td>Middle</td>
<td>Adolescence</td>
<td>Neglect</td>
<td>Emotional</td>
<td>Physical</td>
</tr>
<tr>
<td>5</td>
<td>No</td>
<td>Female</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>No</td>
<td>Male</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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</tr>
<tr>
<td>2</td>
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<td>Female</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
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<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>27</td>
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<td>Female</td>
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<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>47</td>
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<td>Male</td>
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<td>No</td>
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<tr>
<td>36</td>
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<td>No</td>
<td>Yes</td>
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<tr>
<td>39</td>
<td>No</td>
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<tr>
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</tr>
<tr>
<td>35</td>
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<tr>
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<td>Yes</td>
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<tr>
<td>37</td>
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<td>Male</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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</tr>
</tbody>
</table>
7.3.2.5 Comparison of results across the four subgroups: Indigenous females, Indigenous males, non-Indigenous females and non-Indigenous males.

As shown throughout this chapter, there is considerable overlap across maltreatment dimensions, and apparent associations and interactions between these dimensions and offending. The results of this study indicate that it is justifiable to treat Indigenous males, non-Indigenous males, Indigenous females and non-Indigenous females as distinct subgroups, as the associations between maltreatment dimensions and offending appear to vary according to sex and Indigenous status.

As shown throughout this chapter there were sex differences across maltreated Indigenous young people. Specifically, early childhood neglect substantiations were associated with increased offending rates by maltreated Indigenous females, yet were associated with lower offending rates amongst maltreated Indigenous males. Alternatively, adolescent emotional abuse substantiations, and neglect substantiations in middle childhood appeared more related to offending by Indigenous males than Indigenous females.

Likewise, maltreatment type and frequency appeared to have differential associations with offending by non-Indigenous males compared to non-Indigenous females. Specifically, maltreatment frequency appeared to be associated with increased offending by both subgroups, but more so among females. Importantly, these relationships also varied across maltreatment types. To assist with comparison across the four subgroups, Table 7.22 presents for each subgroup, the two configurations with the highest proportion of offenders, and the two configurations with the lowest proportion of offenders.
Table 7.22

Two configurations with the highest proportion of offenders and two configurations with the lowest proportion of offenders by sex and Indigenous-status

<table>
<thead>
<tr>
<th>Config.</th>
<th>Indigenous</th>
<th>Sex</th>
<th>Maltreatment timing</th>
<th>Maltreatment type</th>
<th>Frequency</th>
<th>Offended</th>
<th>N</th>
<th>% of Population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Early</td>
<td>Middle</td>
<td>Adolescence</td>
<td>Neglect</td>
<td>Emotional</td>
<td>Physical</td>
</tr>
<tr>
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<tr>
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<tr>
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</tr>
<tr>
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</tbody>
</table>

Note: Configurations with the highest proportion of offenders for each sub-group are highlighted in **bold** font.
As shown in Table 7.22, across Indigenous males, Indigenous females, and non-Indigenous females, the two configurations with the highest proportion of offenders were characterised by maltreatment substantiations continuing into, or beginning during, adolescence. This pattern was disrupted across non-Indigenous males. As demonstrated in Table 7.22, though the configuration with the highest proportion of non-Indigenous male offenders was characterised by adolescent maltreatment substantiations, the second highest offending proportion related to chronic maltreatment substantiations across early and middle childhood. As noted previously, this may indicate that maltreatment had actually ceased in adolescence, or alternatively, may indicate an alternative turning point which prevented substantiation.

Taken together, the figures included in Table 7.22 indicate that neglect and physical abuse warrant additional research attention. Further, these figures appear to indicate that maltreatment frequency has a greater association with offending by non-Indigenous maltreated young people than Indigenous young people. Alternatively, frequency of maltreatment substantiations may reflect variations in maltreatment surveillance and detection across these groups.

Across all four subgroups, the two configurations with the lowest proportion of offenders were characterised by maltreatment substantiations which ceased prior to adolescence. Importantly, within the Indigenous sub-groups, there were no dominant maltreatment configurations that contained no offenders. Alternatively, within the non-Indigenous subgroups, the two configurations with the lowest offending rates, were configurations with zero offenders.

7.3.2.6 Summary and Discussion of the Results

Overall, the results of this study highlight the heterogeneous nature of life-course maltreatment experiences, as observed in administrative data representing substantiated events. Further, these results indicate highly complex interactions between maltreatment dimensions and subsequent offending rates. One particularly important result from this study relates to the differential associations between maltreatment dimensions and offending among Indigenous versus non-Indigenous young people, and males versus females in these groups.
The results presented in this chapter imply that future research using Australian data would benefit from treating Indigenous males, Indigenous females, non-Indigenous males and non-Indigenous females, as four distinct subgroups with potentially unique links between maltreatment dimensions and offending. Likewise, future research would benefit from further exploration of interaction effects of maltreatment timing, type, frequency, and chronicity and subsequent offending within and between each of the abovementioned subgroups. It is likely that these four subgroups have different risks and needs, which could be addressed through targeted intervention efforts. These observations are consistent with assumptions drawn from DLC and DST in Chapter Two of this thesis.

Overall the results of this study indicate that maltreatment types may have a different association with offending depending upon the time at which they are substantiated. Though again, neglect and to a lesser extent physical abuse, appear to share important links to offending. The results of this study also indicate a relatively consistent link between maltreatment in adolescence and increased risk of offending. These results regarding the impact of neglect and adolescent maltreatment are consistent with the results of Study 1. It is possible that youth offending interventions directed at adolescents with substantiated maltreatment may capture a large proportion of the maltreated individuals who are most at risk of offending. Yet, there are additional maltreatment configurations, not characterised by adolescent substantiations, which also share links with offending. While youth offending interventions could target adolescents with substantiated maltreatment, there is still an ongoing need to consider maltreatment across the life-course. Efforts to understand maltreatment across the entire life-course would assist in understanding complex interactions between dimensions which underlie maltreatment and offending links in general, and adolescent maltreatment and offending links in particular.

Basically, little is known about the “lived experiences” which underlie the links between adolescent maltreatment and offending, and neglect and offending observed across the three Studies of this thesis. While the general categories of neglect substantiations and adolescent maltreatment substantiations can be consistently noted in relation to a higher rate of youth offending, there is enormous heterogeneity and complexity within these categories. These observations reflect back on assumptions of the theoretical influences of this thesis, DLC and DST, which highlighted the likelihood
of complex interactions between multitudes of factors across the developmental system over time.

The results of the CACC make it possible to examine substantiated maltreatment configuration pairs to note variations in offending associated with the presence, absence, or degree of distinct maltreatment dimensions. However, as noted in Study 2 the nature of administrative data, and the impact of historical context on these data, may limit generalisability of the observations. Importantly, the strength of this study does not lie in specifying the exact combination of maltreatment dimensions leading to offending. Rather, the strength of this study lies in highlighting variations across subgroups of maltreated males versus females, and Indigenous youth versus non-Indigenous youth, as well as the overwhelming degree of overlap and interaction of maltreatment dimensions. The results of this study highlight the clear need for additional research in future which accounts for overlap and interactions between maltreatment dimensions, and the impact of these on observed links between child maltreatment and youth offending.

7.4 Strengths and Limitations of This Design: Future Applications

The CACC method is designed with the assumption of “...maximum causal complexity” (Miethe et al., 2008, p. 239) of multiple variables, which, at a surface level, complements the underlying assumptions of both theoretical influences in this thesis (DLC and DST) as well as available empirical research regarding the links between maltreatment and offending. Specifically, it is assumed that the links between maltreatment and offending are complex, and, complementarily, CACC assumes maximum causal complexity amongst multiple variables, and enables thorough visual inspection and examination of these. In the words of Miethe et al. (2008, p. 239) “This method offers a middle ground between (1) the focus on specificity and multiple causality that underlies most qualitative research and (2) the variable-oriented search for general patterns across contexts in most quantitative research”. As applied in this thesis, a particular strength of CACC was the ability to monitor variations across males and females and non-Indigenous and Indigenous Australian youths, free of the assumption that gender and racial impacts would be consistent across all maltreatment dimensions (Hart, Miethe, & Regoecri, 2014).
In this Study, CACC was beneficial in illustrating the heterogeneous nature of maltreatment experiences across the life-course, as reflected in administrative data of substantiated events. Additionally this analytical technique was valuable for identifying the variations in the impact of maltreatment dimensions which were attributable to Indigenous status and sex. The CACC was also very useful in identifying the potential overlap between maltreatment type, timing and frequency, and provided some initial indication of the unique associations between these dimensions and variations in offending amongst maltreated youths.

As identified throughout this chapter, due to the overlap between maltreatment chronicity and the multi-type maltreatment substantiations, it was difficult to determine the unique associations of either of these dimensions with youth offending. Nonetheless, the CACC was particularly beneficial for providing the initial indication of this overlap between these dimensions, which is a valuable contribution to future research.

Researchers applying this technique in future could consider alternative treatment of the predictor variables. For example, there may be benefit to exploring alternative methods of operationalising maltreatment frequency and chronicity. Similarly, researchers could explore alternative methods of accounting for the impact of maltreatment at transition points, as well as child protection intervention efforts. Data were not available to account for child protection interventions for the QLD90 dataset. Future research would benefit from attempts at accounting for the impact of child protection interventions on links between maltreatment dimensions and youth offending.

As argued throughout this chapter, it was not possible to identify the statistical significance of any observed differences in offending rates amongst maltreated children in any of the configuration pairs. Nonetheless, the observations enabled by this CACC provide an important starting point for future research by identifying elements of maltreatment dimensions and their interrelationships, which require additional research and examination. Of course, it is important to reiterate here that the configurations presented in this chapter reflect the frequency and timing of recorded contact with the child protection system for substantiated maltreatment, and offending outcomes. Maltreatment substantiations may not necessarily reflect actual maltreatment experiences. In many instances, multiple maltreatment types may have been
experienced by the individual at the time of substantiation, but only the most serious harm type is recorded. It is also possible that individuals experienced other episodes of maltreatment at other points in the life-course which were not reported to, and substantiated by, the Department. It would be valuable to perform a CACC using self-report data, particularly to explore the extent to which administrative records reflect lived experiences and actual associations between maltreatment dimensions and offending.

Data regarding the severity of maltreatment episodes were not available for these analyses. Inclusion of severity in this analysis may have altered observed links between maltreatment and offending. Likewise, characteristics of the broader developmental systems of the individuals included in the dataset remain unknown. While it is clear from the results of this study that maltreatment experiences are heterogeneous, and the links between substantiated maltreatment and offending are complex, it is highly likely that the inclusion of additional details of the developmental system of these individuals would highlight an even larger degree of heterogeneity and complexity in observed maltreatment and offending links. Overall, the results of this Study indicate the need for further research on the links between maltreatment dimensions and youth offending, with particular examination of interactions between these dimensions and their alternative effects within distinct maltreatment sub-groups of Indigenous and non-Indigenous males and females.

7.5 Links to Chapter Eight

The three studies of this thesis have each contributed unique insight into the links between maltreatment dimensions and youth offending. The next chapter, Chapter Eight, presents a discussion of the results of the three studies of this thesis with reference to the two primary research questions: Research Question One: Which maltreatment dimensions are related to youth offending? and Research Question One: Do the links between maltreatment dimensions and youth offending change across cohorts? The discussion includes consideration of the implications of the results of this thesis for theory, policy and practice, and future research.
Chapter Eight: Discussion

8.1 Chapter Overview

The primary aim of this thesis was to examine the links between child maltreatment and youth offending. Particular consideration was provided to the heterogeneous and complex nature of child maltreatment across childhood and adolescence, within the broader developmental system and historical context. It was assumed that the use of a series of modern analytic methods would allow simultaneous consideration of multiple maltreatment dimensions alongside examination of their unique effects.

There were three propositions that were central to this thesis. First, in order to progress maltreatment and offending research, researchers must consider child maltreatment temporally, across all of childhood and adolescence, with simultaneous consideration of maltreatment dimensions, such as the timing, type, frequency and chronicity of the maltreatment, as well as multi-type maltreatment. Second, consideration must be provided to the potential impact of jurisdiction and historical context on observed maltreatment and offending links. Third, in Australian research, consideration must be provided to the potentially differential maltreatment experiences and offending outcomes of Indigenous Australian children and young people compared to non-Indigenous Australian children and young people.

Extending from the above observations, the two primary research questions of this thesis were: Research Question One: Which maltreatment dimensions are related to youth offending? and Research Question One: Do the links between maltreatment dimensions and youth offending change across cohorts? These research questions were addressed by three separate, yet interrelated, studies. The purpose of this chapter is to summarise the results of the three studies of this thesis in relation to the two primary research questions, and discuss their implications for theory, policy and practice, and future research.

First, this chapter provides a summary and integration of the results from the three studies in relation to the two primary research questions of this thesis and existing empirical literature. Second, the strengths and limitations of the methodology and
analytic strategy of this thesis are discussed. Third, the implications of the results of this thesis are discussed with reference to theory, and policy and practice. Fourth, and finally, this chapter is concluded with a discussion of potential directions for future research on child maltreatment and its outcomes.

8.2 Summary and Interpretation of the Results: Links to Empirical Literature

8.2.1 Research Question One: Which maltreatment dimensions are related to youth offending?

Taken together, the results of the three studies of this thesis indicate complex interactions between maltreatment dimensions and youth offending. Overall, it appears unlikely that any single maltreatment dimension is responsible for the links between maltreatment and offending. Rather, there appear to be complex interactions between numerous maltreatment dimensions, which influence overall maltreatment and offending links. In particular, there are important overlaps between maltreatment chronicity, frequency and multi-type maltreatment. Likewise, the impacts of maltreatment types appear to vary depending on their timing. Perhaps the most important result to emerge from this thesis was the demonstration that the links between maltreatment and offending vary across subgroups of Indigenous females, non-Indigenous females, Indigenous males and non-Indigenous males. These results of this thesis highlight the value of applying developmental systems theory (DST) and developmental and life-course criminology (DLC) perspectives to maltreatment and offending research (discussed further below in section 8.5).

Importantly, the use of mixed analytical methods was valuable in this thesis, as each study provided a unique response to the research questions. Taken together, the results of the three studies provided a more comprehensive response to the research question than any one of the studies in isolation. The results of Study 1 regarding the unique impact of distinct maltreatment dimensions, provided a point of comparison with existing literature. More importantly, though, the results of Study 2 and 3 provided crucial contextualisation of the results of Study 1.

Consistent with much of the existing literature regarding the links between maltreatment dimensions and youth offending, the results of the Study 1 of this thesis
highlighted a significant link between neglect and youth offending (Zingraff et al., 1994, Mersky & Reynolds, 2007, Yun et al., 2011). No unique impact on youth offending was noted for emotional abuse. Though this maltreatment type has received limited research attention in relation to youth offending, Elklit et al. (2013) did note a significant impact of emotional abuse on self-reported crime.

Interestingly, the results of the binary logistic regression indicated that sexual abuse did not increase risk of offending in the QLD90, QLD83 or QLD83/84 cohorts. In fact, binary logistic regression of the QLD90 cohort indicated a significant negative relationship between sexual abuse and offending. It is possible that sexual abuse does not increase risk of youth offending. However, there are at least four possible alternative explanations for this result. First, the use of child protection administrative data may prevent consideration of a large portion of sexual abuse cases. Specifically, consistent with legislative requirements, sexual abuse cases reflected in the datasets of this thesis represent only sexual abuse perpetrated by parents or caregivers of the child. Importantly, a large portion of sexual abuse is committed by non-parents or caregivers (Child Family Community Australia, 2014) and these cases are typically dealt with through the criminal justice system rather than the child protection system. Cases of sexual abuse in which a parent or caregiver is not the perpetrator are not the jurisdiction of the Queensland child protection system or included in Queensland child protection administrative data unless the parent or caregiver failed to protect the child from sexual abuse when they had the capacity to do so, and hence would be more likely classified as neglect or similar.

Second, consistent with observations made in Section 3.5.1 of Chapter Three, it is possible that the absence of observed links between sexual abuse and offending in this thesis is due to the use of official data to represent youth offending. For example, Zingraff et al. (1994), Swanston et al. (2003), and Siegel and Williams (2003) found varying links between sexual abuse and offending. It is possible that observable links between sexual abuse and offending vary according to outcome measure, namely official records of offending versus self-reports of offending (Swanston et al., 2003). Third, the results of Study 1 may indicate a “sleeper effect” (Smith et al., 2005). Based on their results, Smith et al. (2005) hypothesised a “sleeper effect” whereby the impact of sexual abuse on criminal offending may not be observed until adulthood. To explore this possibility it would be necessary to link the existing datasets to official records of
adult offending. Reanalysis of the cohort datasets using adult offending outcomes would extend understanding of the impact of heterogeneous maltreatment measures on offending.

Fourth and finally, it is possible that there are other variables from the broader developmental system of these children and young people that are impacting on this result, but are not incorporated in administrative data. For example, the broader developmental system of individuals who experience sexual abuse may differ from the developmental system of individuals who experience neglect, emotional abuse, physical abuse, or multi-type maltreatment. These broader characteristics of the developmental system may in fact represent risk or protective factors which are independently responsible for variations in offending outcomes of affected young people. Building on the above argument, it should also be noted that the links between neglect and youth offending that were observed throughout the three studies of this thesis, may also be attributable to elements of the broader developmental system of the affected individuals, or limitations of the administrative data. First, individuals who experience neglect may exist in developmental systems with different or more numerous risk factors which are themselves responsible for a higher rate of offending. For example, Verrecchia et al., (2011) hypothesised that the links between neglect and offending may relate to a lack of supervision or, alternatively, may be moderated by risks within the individual and the family. In other words, “maltreatment is connected to delinquency in the context of multiple ecological risks” (Verrecchia et al., 2011, p.210). Second, as noted in earlier chapters of this thesis, administrative data often reflect decision making by professionals. For example, police officers’ decisions to divert young offenders from formal processing may in part rest upon assessments of the young person’s family environment and the capacity for parental involvement, among other factors (Schulenberg & Warren, 2009). It is possible that police may be less inclined to divert young offenders when their family environment indicates a lack of capacity for appropriate supervision or involvement from parents or guardians, meaning young people with neglectful caregivers may be less likely to receive diversion options than young people with abusive caregivers. This may give the appearance that neglect increases the risk of offending, while sexual abuse decreases risk of offending. Differences across the broader developmental system may also contribute to variations noted across Indigenous and non-Indigenous young people regarding the links between
maltreatment dimensions and youth offending. As noted throughout the three studies of this thesis, reliance on administrative data restricted exploration of the potential impact of variables from the broader developmental system such as poly-victimisation, SES, community factors, and school attendance, engagement and achievement. These points are discussed further in Section 8.4 of this chapter, in relation to implications of the results of this thesis for policy and practice.

The results of Study 1 regarding the impact of maltreatment timing were largely consistent with the literature. Specifically, the results indicate the maltreatment that occurs in adolescence is linked to youth offending, while maltreatment in early childhood and middle childhood is not. These results are consistent with the results of Ireland et al. (2002) and Thornberry et al. (2010). The results of Study 1 regarding the impact of physical abuse and maltreatment frequency on offending provided the first indication of the potential impact of historical context on observed maltreatment and offending links. Specifically, though physical abuse increased risk of offending in the QLD83 and QLD83/84 regressions, physical abuse was not significant in the QLD90 regressions (discussed further in section 8.3.2).

It is also important to consider whether the stronger link between adolescent maltreatment and offending compared to maltreatment in early and middle childhood may reflect the impact of a lack of reporting or substantiation. For example, it is possible that some individuals who came to the attention of the department in adolescence may have experienced maltreatment in earlier developmental periods which was not reported, and by extension, received no intervention. In this sense, the lower incidence of offending among individuals maltreated in early or middle childhood may be due to the effectiveness, or protective impact, of departmental interventions.

Importantly, due to the heterogeneous nature of child maltreatment, it is important to consider interactions between maltreatment dimensions. While the logistic regression provided an indication of the unique impact of each predictor variable, it did not provide indication of overlap between the variables, or in this instance, the heterogeneous nature of maltreatment experiences across the life-course, and the links between these heterogeneous experiences and offending. Notably, the results of Study 1 were effectively contextualised by the results of Study 2 and 3.
The results of Study 2 provided the first tangible indication of the potential overlap between several maltreatment dimensions, particularly maltreatment frequency, chronicity, timing and multi-type maltreatment. These results also provided insight into the nature of maltreatment experiences of Indigenous youths compared to non-Indigenous youths. Again, adolescent maltreatment appeared to increase risk of offending. Lastly, the results of Study 2 identified a number of maltreatment trajectories with a peak in maltreatment frequency at or near transitions points, particularly coinciding with the transition to primary school, and the transition from primary school to secondary school. This is an important similarity to the results of Finkelhor et al. (2009), and also complements assertions of DLC, particularly the observations of Sampson and Laub (2005) regarding the importance of transition points to developmental outcomes.

As argued by Stewart et al., (2008), the increase in substantiated maltreatment at transition points could be attributed to increased contact with mandated reporters of maltreatment, or alternatively, may represent an actual increase in maltreatment resulting from increased stress on the family in relation to the transition. The links between maltreatment which occurs at transition points and increased risk of youth offending are likely to be complex, but possible explanations could be a negative impact of the maltreatment on school achievement, thereby increasing risk of youth offending (Stewart et al., 2008). Due to reliance on administrative data, the processes underlying these links cannot be examined directly in this thesis. Overall, the results of Study 2 highlighted the need for analytic methods capable of accounting for overlap across maltreatment dimensions, unique and shared impacts of maltreatment dimensions on youth offending, and variations across males and females, and Indigenous youths compared to non-Indigenous youths. The use of CACC and the results of Study 3 were particularly beneficial in highlighting the previously hidden interactions between several maltreatment dimensions. In particular, the results of Study 3 indicate that the links between maltreatment and offending vary for males compared to females, and for Indigenous youth compared to non-Indigenous youth. Further, the results indicate that maltreatment types have different impacts across different developmental periods, suggesting that the unique impacts of maltreatment dimensions such as timing and type are not as direct as initially believed.
The results of Study 3 highlighted considerable overlap between maltreatment chronicity and frequency, indicating the need for greater caution by researchers in interpretation of results regarding the examination of either of these variables in isolation. Overall, the results of Study 3 clearly highlight the need for additional research in this area accounting for complex and heterogeneous relationships between several maltreatment dimensions across the life-course of diverse sub-groups and youth offending.

In many ways, the results of this thesis have produced more questions than answers. Based on the results of the three studies, it appears that neglect is particularly relevant to youth offending, as is maltreatment in the adolescent period. However, under certain conditions, the remaining maltreatment dimensions also share links with offending. It is possible that youth offending interventions targeted towards maltreated adolescents may capture an important proportion of youth offenders, but not all maltreated offenders. Rather than focusing on these isolated dimensions, youth offending intervention and prevention efforts may be better served by consideration of interactions between numerous maltreatment dimensions across the life-course, particularly to develop an understanding of the processes underlying the links between maltreatment and offending.

Again, interactions across maltreatment dimensions and youth offending observed in Study 2 and 3 must be interpreted with acknowledgment of the potential limitations of administrative data. Specifically, as noted throughout this thesis, there are likely to be important inconsistencies between the lived experiences of the affected children and young people and their administrative records. Details regarding maltreatment type, timing, frequency and chronicity are likely influenced by appropriate recognition and reporting decisions by reporters, as well as the availability of adequate evidence to support substantiation decisions by child protection workers. Nonetheless, while these limitations must be acknowledged, the contribution of this thesis to this field of research remains important.

Guided by the results of this thesis, it may be argued that research accounting for single maltreatment dimensions in isolation may result in flawed research conclusions, and by extension, limited effectiveness in youth offending intervention and prevention efforts. Specifically, isolated examination of any single maltreatment dimension would
under-represent the complex relationships which occur between them, which may possibly affect their observed impact on offending. Future research, and youth offending intervention and prevention efforts, must account for complex interactions between several maltreatment dimensions. In Australian research, consideration of complex interactions must be extended to also account for differential experiences and outcomes for males compared to females and Indigenous youths compared to non-Indigenous youths.

8.2.2 Research Question 2: Do the links between maltreatment dimensions and youth offending change across cohorts?

Comparison of the analyses of the QLD83, QLD83/84 and QLD90 longitudinal datasets across Studies 1 and 2, indicated that the links between maltreatment dimensions and youth offending remained largely consistent across the cohorts. The clearest and most important change across the cohorts was noted in Study 1. The logistic regressions in Study 1 indicated that physical abuse was a significant predictor of offending in the QLD83 and QLD83/84 cohorts, but was not a significant predictor of offending in the QLD90 cohort.

As noted during interpretation of the results of Study 1, it is possible that this variation in significance of physical abuse was due to the historical context surrounding the Queensland child protection system across these cohorts. Figure 4.2 in Chapter Four indicated a decrease in the rate of substantiations of physical abuse, relative to the other maltreatment types, across the cohorts. The exact reason for this change in substantiations of physical abuse relative to the other maltreatment types is unclear. Regardless, this result highlights the need for caution in interpretation of research which examines the isolated impact of single maltreatment types in single data sources.

As noted in Study 1, one possible explanation for the changing significance of physical abuse across cohorts is the presence of overlap across maltreatment dimensions, and the experience of multi-type maltreatment. Specifically, as knowledge of each maltreatment subtype increased, it is possible that decisions regarding the “most serious harm type” present in cases of multi-type maltreatment changed (Bromfield & Higgins, 2004; Bromfield & Holzer, 2008). Unfortunately, due to the nature of these administrative datasets, it is not possible to determine the presence of multi-type
maltreatment at each substantiation, only a change in “most serious harm type” across substantiations for individuals who had multiple distinct substantiations across the life-course. Interestingly though, as noted in Chapter Three of this thesis, figures reported in the Child Protection Australia 2013-14 report, indicated that among children and young people who had contact with Australian child protection systems in the 2013-14 financial year for substantiated maltreatment, there was considerable co-occurrence between maltreatment types (Australian Institute of Health and Welfare, 2015b). Furthermore, in cases of co-occurrence, co-occurrence between physical abuse and emotional abuse was common (46.9%), as was co-occurrence between emotional abuse and neglect (30.4%) (Australian Institute of Health and Welfare, 2015b).

Perhaps increased awareness of the importance of neglect and emotional abuse, which occurred throughout the 1990s (Child Family Community Australia, 2015), resulted in these maltreatment subtypes being recorded as the ‘most serious harm type’ when they co-occurred with physical abuse in the QLD90 cohort. Figure 4.2 in Chapter Four indicates an increase in substantiations of emotional maltreatment and a stable rate of substantiations of neglect alongside the decrease in substantiations of physical abuse. Though this potential relationship cannot be examined in this thesis, it may be useful if future research examined the degree of overlap between physical abuse and emotional abuse, and variations to substantiation decisions within the Queensland child protection system over time.

In Study 2, there was some identified variation across the QLD83/84 and QLD90 datasets with regards to the apparent degree of overlap between maltreatment frequency, timing, and overrepresentation of Indigenous youths, and youth offending outcomes. Nonetheless, overlap between these variables was noted for both cohorts. It is possible that the method of Study 3 may have assisted in more clearly highlighting differences across the datasets, had the QLD83/84 dataset been subjected to CACC. Perhaps the impact of historical context was hidden in comparisons across the datasets by the overwhelming complexity of interactions between maltreatment dimensions. There remains a clear need to consider the impact of historical context in future research. Though, in this thesis, the impact of historical context was more obvious within cross-sectional data presented in Chapter Three, than the comparison of cohorts in Study 1 and 2.
It is possible that an impact of historical context may be observed in comparisons of cohorts separated by a greater period of time. The cohorts examined in this thesis shared some period of overlap. In their research regarding changing rates of maltreatment and victimisation in the USA, Finkelhor and Jones (2006) noted an important distinction between “period effects” and “cohort effects”. Specifically, “cohort effects” are those changes that only influence individuals born at or around a particular point in time, while “period effects” are those that affect all individuals (ie. multiple cohorts) across one period in time. It is likely that there were overlaps in period and cohort effects in this thesis. Importantly, researchers have acknowledged longstanding difficulties in separating age, period and cohort effects in studies of real-world processes (Bell & Jones, 2013). The application of the method of this thesis to newer cohort datasets from Queensland would provide a valuable opportunity to test this distinction.

Additionally, greater insight into the impact of historical context on observed maltreatment and offending links may be obtained from application of the method of this thesis to comparative data from other Australian States and Territories and international datasets. As indicated by the theoretical influences discussed in Chapter Two of this thesis, variations are likely to exist across time and place.

8.3 Strengths and Limitations of the Methodology and Analytic Strategy Used in This Thesis

As highlighted throughout the three studies of this thesis, reliance on administrative data resulted in some restrictions to interpretation of results. The impact of child protection interventions, particularly out of home placements, on maltreatment and offending links, could not be determined in this thesis. Study 3 in particular, highlighted the difficulties associated with teasing apart the effects of maltreatment chronicity and frequency in the absence of information regarding out of home placements. Some studies have identified that out of home placements and other maltreatment interventions can affect the links between maltreatment and offending (Eckenrode et al., 2001; Jonsson-Reid & Barth, 2000). Future data extractions of administrative data which include details of interventions and out of home placements may provide partial solutions to this problem. However, alternative research methods
such as qualitative interviews could provide additional insights. For example, qualitative research could be designed to account for maltreated individuals’ maltreatment and victimisation experiences, and interventions received, as well their own perspectives of the ways in which these experiences shaped their development.

The impact of maltreatment severity could not be explored for the QLD90 cohort across the three studies of this thesis. As indicated by the results of Verrecchia et al. (2011), inclusion of maltreatment severity variables in the three studies of this thesis may have altered the obtained results across the three studies of this thesis. It would be beneficial to include some measure of severity in future applications of this method to maltreatment and offending data. Likewise, information regarding the perpetrator of the maltreatment may have made an important contribution to understanding variations in outcomes for maltreated children (Barnett et al., 1993; LeRoy et al., 2014).

Further, it should be noted that the administrative datasets utilised in the three studies of this thesis, only included individuals with formal contact with the child protection system. The differences between individuals with substantiated and unsubstantiated maltreatment events may be smaller than the differences between individuals with formal systems contacts and those without. For example, previous research has noted limited differences between groups of individuals in contact with the child protection system who have substantiated versus unsubstantiated cases (Hussey et al., 2005; Snyder & Smith, 2015). Likewise, as noted by Manly (2005, p. 429) “...reports that are unsubstantiated may, nevertheless, reflect dysfunction in families who could benefit from support and therapeutic preventive programming”. It is possible that the links between maltreatment experiences and youth offending outcomes observed in this thesis may vary with inclusion of a broader research sample not limited to formal contacts with the child protection system. Reliance on administrative data in this thesis may have exaggerated some observed links while obscuring others. It would be valuable to have data from individuals in the broader community to explore the links between self-reported maltreatment and offending. This observation supports the arguments of other researchers regarding the need for a national incidence study in Australia which incorporates large-scale self-report data of a range of life-course victimisation experiences and developmental outcomes (Child Family Community Australia, 2014; Higgins, 2004a).
The incorporation of complementary qualitative data may assist in unravelling underlying processes of the interactions noted between maltreatment dimensions in this thesis. Due to the strengths and limitations associated with both self-report and official data, researchers have discussed the importance of using both sources of data in maltreatment research (J. Brown, Cohen, Johnson, & Salzinger, 1998). Importantly, Brown et al. (1998) used a combination of self-reports and official records of child maltreatment in their research, and identified limited correspondence between these two data sources. Potential discrepancies between self-reports and official records require additional investigation in future research.

Due to the nature of the administrative data used in this thesis, it was impossible to be sure that the recorded “most serious harm type” accurately reflected the lived experience of the affected child (Bromfield & Higgins, 2004). As argued by Lau et al. (2005, p. 548) administrative records may be “…better characterized as groups of report types rather than reified as actual constellations of maltreatment experiences”. The incorporation of qualitative data in future research may assist in gaining a greater degree of insight into the lived experiences of maltreated children, which in turn, would allow a greater understanding the potential processes underlying observed links.

As highlighted in Chapter Three of this thesis, definitions of child maltreatment in general, and maltreatment dimensions in particular, vary widely across studies. The operationalisation of key variables in this thesis was largely dependent upon the nature of the administrative data used. Future research may benefit from exploring the method used through this thesis, and experimenting with alternative operationalisations of key variables. An important test of the value of the methodology of this thesis would be the application of this methodology and analytic strategy to comparative datasets from other national and international jurisdictions.

The experience and effects of other forms of victimisation, such as poly-victimisation experiences (Finkelhor et al., 2007a), as well as other risk and protective factors throughout the broader developmental system, could not be examined in this thesis via analysis of the available administrative data. Hence, the results of this thesis represent a small part of a broader and more complex phenomenon of child victimisation and youth offending. Nonetheless, this thesis has illustrated the complex nature of maltreatment experiences over childhood and adolescence, thereby indicating
that the broader phenomenon of poly-victimisation, and particularly its links to negative developmental outcomes, may be even more complex than currently understood.

Overall, the benefits of administrative data, and the methodology and analytic strategy of this thesis should not be ignored. The use of administrative data enabled timely and cost effective temporal examination of life-course maltreatment and subsequent youth offending, as well as consideration of historical context. Additionally, one often ignored benefit of official data is that it represents children whose maltreatment experiences have been recognised, and who are immediately accessible for intervention efforts. Children who remain unknown to the child protection system cannot feasibly receive targeted interventions. Arguably, current intervention efforts designed to break the links between maltreatment and offending should be catered towards the needs of children known to the child protection system. Of course, additional research aimed at improving recognition and reporting of maltreated children not yet in contact with the child protection system is also required.

As demonstrated across the three studies of this thesis, there are benefits to subjecting a single dataset to numerous analytic methods. The integration of the three studies of this thesis provided a deeper and more comprehensive response to the research question than any one of these studies in isolation. Furthermore, the use of different methods of coding for important research variables, such as maltreatment timing, allowed greater insight into their effects. The use of mixed analytic methods on a single dataset also provides some reference point for researchers to expand their discussion of the merits of different analytical approaches and data sources. As told by Fallon et al. (2010, p. 78), “Each approach provides insight into the extent and nature of child maltreatment, which is the foundation for prevention of child maltreatment”. At a minimum, the results of this thesis provide a valuable starting point for future research.

8.4 Implications for Policy and Practice

As posited by Herrenkohl and Herrenkohl (2009), if child protection workers are forced to identify the predominant type of maltreatment present in cases of multiple maltreatment, they “…may focus on the maltreatment type that is most likely to be upheld in a court hearing” (p. 492). Child protection administrative data would be more useful if all maltreatment types present at the point of substantiation were recorded.
Being able to account for co-occurrence of maltreatment would enable better understanding of the links between maltreatment experiences and child outcomes, which in turn could inform intervention and prevention efforts (Herrenkohl & Herrenkohl, 2009). The results of the three studies of this thesis indicate that data collection by child protection workers should, at a minimum, account for the presence or absence of all maltreatment types, as well as the timing, frequency, severity, chronicity, and perpetrator(s) of each.

Based on his results regarding the prevalence of multi-type maltreatment and the value of maltreatment groupings based on frequency and severity rather than type, Higgins (2004a) made a range of recommendations for Australian policy and practice that remain relevant in relation to the results of this thesis. In particular, Higgins (2004a) identified the likelihood of multiple causes of maltreatment and the subsequent need for multi-dimensional approaches to family support, and intervention and prevention for a range of developmental outcomes. Additionally, Higgins (2004a) noted the potential value of policies and treatment programs which consider the extent to which an individual has experienced each maltreatment type, rather than classifying individuals into separate categories of maltreatment. Higgins (2004a) also noted the potential for differential treatment approaches for individuals with multi-type, severe or frequent maltreatment compared to individuals with single type or low-frequency maltreatment. Lastly, Higgins (2004a) suggested the potential value of intervention strategies that involve the family of the child and acknowledge the likelihood of a dysfunctional family environment.

By building on Higgins’ (2004a) arguments and incorporating the theoretical frameworks of this thesis, it is reasonable to assume that for many children, substantiated maltreatment is indicative of risk or dysfunction across the broader developmental system and, as such, prevention, intervention and treatment efforts regarding a range of developmental outcomes should seek to target these risks at as many different points in the developmental system as possible. This would likely require integrated efforts across a range of government bodies and services providers. While the value of child protection administrative data would be increased for researchers if data collection was expanded to include details of the broader developmental system and victimisation experiences of children and young people, the current child protection legislative framework limits intervention to harm from parents.
and caregivers. Future child protection legislative reform may benefit from consideration of the above arguments.

The results of this thesis indicate that the heterogeneous and complex nature of child maltreatment and its links to youth offending cannot be better understood without additional temporal, life-course data, simultaneously accounting for numerous maltreatment dimensions. As stated by Proctor (2012), there is a “…gap between research advances and real-world care” (p. 107). Perhaps a greater degree of interaction between researchers and persons active within the child protection system would allow the collection of data which is valuable to researchers, and conversely, the production of research which has clear value and can be readily applied by child protection workers.

In particular, the results of this thesis indicate differential links between maltreatment and offending for males compared to females, and Indigenous youth compared to non-Indigenous youth. Variations in the risks and needs of these subgroups may need to be considered when designing and assessing youth offending intervention and prevention efforts. Building on assumptions of DLC and DST, it is logical to assume that the broader developmental system, including historical context, of Indigenous Australian youths differs from non-Indigenous Australian youths, and these differences may lead to differential outcomes for these groups.

Lastly, as discussed by Cashmore (2011), Australian child protection systems are characterised by “systems neglect of adolescents”. Specifically, Cashmore (2011) noted the imbalance between the overrepresentation of adolescents in the child protection system, and the limited responses provided to these adolescents in the child protection and youth justice systems. In particular, Cashmore (2011) noted the need for increased interventions “early in the pathway” as opposed to interventions that are restricted to “early in the life”. As noted previously, the results of this thesis did highlight increased risk of offending following maltreatment in the adolescent period compared to maltreatment in early or middle childhood.

Importantly, the results of this thesis also highlighted considerable interactions between several maltreatment dimensions which affect maltreatment and offending links. Overall, the results of this thesis provide support for the arguments of Cashmore (2011) regarding the need for interventions “early in the pathway”. The results of Study 3 in particular highlighted several maltreatment configurations resulting in a high rate of
offending, characterised by limited contact with the child protection system prior to adolescence. For these individuals, interventions must take place in adolescence. Clearly, additional research is required to further explore the nature of the many distinct maltreatment pathways and their links to youth offending.

8.5 Theoretical Implications

The incorporation of developmental systems theory and developmental and life-course criminology to this thesis has been valuable and informative. These theoretical frameworks provided initial indication of the potentially complex interactions between maltreatment dimensions and youth offending. In particular, DST and DLC provided a sound framework indicating the potential importance of maltreatment timing and frequency, and historical context, and the capacity for bidirectional relationships between these. Additionally, it appears the links between maltreatment and offending are different for males compared to females, and for Indigenous children and young people compared to non-Indigenous children and young people. Specifically, it appears that different maltreatment types have different impacts for different people, depending upon the developmental period, and the combinations in which they occur. These observations are consistent with the general assumptions of both DST and DLC.

To provide a more intensive application of these theoretical frameworks to research on the links between maltreatment and offending, it would be beneficial to incorporate information regarding other levels of the developmental system, such as details regarding school, neighbourhood, community, and peer groups (Lerner, 2002). As discussed in Chapter Three, the results of Zingraff et al. (1994), Brezina (1998), Verrecchia et al. (2011), demonstrate the importance of these domains to maltreatment and offending links, and their potential impact on observed links between maltreatment and offending.

As discussed in Chapter Three, there are different perspectives regarding the process of impact of multiple maltreatment experiences. Some researchers operate from a cumulative risk perspective, assuming that risk increases alongside the number of maltreatment types experienced, while other researchers operate from an interactive risk perspective, assuming that risk results from interactions between certain maltreatment types (Berzenski & Yates, 2011). The results of this thesis indicate that the links
between maltreatment and offending are most likely a result of interactive risk as opposed to cumulative risk. Specifically, risk of offending appears to be related to complex interactions between multiple maltreatment dimensions, as opposed to the accumulation of any single maltreatment dimension.

To develop a deeper understanding of these complex links between maltreatment and offending, it may be valuable for maltreatment researchers to broaden their theoretical frameworks of interest to include a more comprehensive examination of psychological theories of child and adolescent development. Perhaps it would be valuable to consider which developmental milestones are reached in each developmental period, and the relationship between these developmental milestones and the impact of various maltreatment types in each developmental period. For example, the Developmental Crime Prevention Consortium (1999) noted that each developmental period in the life-course is associated with different developmental tasks and, likewise, different risk factors. These risk factors can affect the individual’s ability to successfully negotiate the required developmental tasks (Developmental Crime Prevention Consortium, 1999). It may be beneficial to explore these developmental tasks and the degree of impact that different maltreatment types may have on each. As noted by Mersky et al. (2012, p. 312), “It may be that the overall effects of maltreatment are not age-graded but the mechanisms that connect maltreatment to criminality do differ according to the age at which the child is victimized.”. The developmental psychopathology literature base may also provide a useful starting point for these enquiries (for example Cicchetti & Toth, 1995). In particular, the developmental psychopathology literature base includes a number of studies which examine the links between maltreatment and psychopathology with consideration of development over the life-course. The methodological and analytic approaches of these studies may be adapted for use in research regarding maltreatment and youth offending links.

Lastly, as indicated in Chapter two of this thesis, both DLC and DST acknowledge the importance of mixed-methods research. The use of administrative data has been valuable in this thesis for illustrating the complex and heterogeneous nature of child maltreatment and its links to youth offending. Importantly, incorporation of qualitative research may assist in developing a deeper understanding of the processes underlying the impact of maltreatment and its links to youth offending.
In particular, there may be value in integrating narrative interviews with individuals born 1983, 1984 and 1990. Given the apparent importance of maltreatment timing in conjunction with other maltreatment dimensions, it may be valuable for researchers to approach qualitative research via the use of life-events calendars (for example Sutton, 2010). This approach would allow deeper consideration of important elements of DST and DLC.

8.6 Directions for Future Research

Perhaps the most important implication of the results of this thesis is the demonstration of the need to consider the many complex interactions that can occur between numerous maltreatment dimensions, and the many processes by which these interactions may affect the links between maltreatment and offending for different subgroups. The results of this thesis highlight the potential problems associated with relying on research that considers the impact of any single maltreatment dimension in isolation. Furthermore, the results of this thesis provide some indication of the need for future researchers to interpret research results with careful consideration of the potential impact of jurisdiction, historical context and related definitional variability.

The results of this research also indicate the value of rigorous analysis of data. Researchers often produce research that addresses a single research question with a narrow selection of variables, rather than demonstrating their exploration of the data in relation to multiple research questions and perspectives. In this sense, existing datasets may benefit from additional, rigorous exploration and analysis through multiple techniques. In particular, there may be value in reapplying the methodology and analytic strategy of this thesis to a newer extraction of Queensland data in future, thereby allowing an additional test of the impact of historical context in this area of research. Similarly, there may be value in applying the methodology and analytic strategy of this thesis to comparative administrative data for multiple cohorts from other Australian and international jurisdictions. This would allow exploration of the impact of jurisdictional variability and historical context on observed maltreatment and offending links. Reapplication of this method to future Queensland administrative data has become particularly relevant due to very recent changes to Queensland’s child protection
legislation, *Child Protection Act 1999*, which raised the threshold for statutory intervention from “harm” to “significant harm”.

The three studies of this thesis only considered the links between maltreatment and offending. It is logical to assume that the complex interactions between maltreatment dimensions are important to other developmental outcomes such as mental health. Perhaps the methods used in this thesis could be valuably applied to additional extractions of administrative data relating to contact with government mental health services. Also, this thesis accounted only for the presence or absence of criminal offending by youths, represented by the presence or absence of at least one recorded conviction. It must be considered whether the onset, extent, type, duration and desistance of youth offending is affected by maltreatment dimensions (Stewart et al., 2005). This would certainly be a valuable topic for future research using these data.

As argued by Feiring and Zielinsk (2011, p. 6), “Culture is inherently complex and contextual and should not be equated with status categories of race or ethnicity”. Qualitative research methods may enable greater understanding of the underlying reasons for the differential maltreatment experiences of Indigenous Australian children and adolescents compared to non-Indigenous Australian children and adolescents. Future research would likely benefit from comprehensive examination of potential differences between the developmental systems of Indigenous youths compared to non-Indigenous youths in Australia, particularly guided by key features of Developmental Systems Theory. Likewise, as noted earlier in this thesis, Australia is a culturally diverse nation. There may be benefits in exploring variations across other cultural groups in Australia.

Lastly, as identified above, the data utilised in this thesis precluded consideration of poly-victimisation experiences, and the impact of these on offending outcomes among maltreated children. Finkelhor et al. (2009, p. 316) argued that early identification of children most likely to become poly-victims, would result in more effective direction of prevention resources, thereby improving outcomes for these children. While the use of official maltreatment data does limit researchers’ ability to account for poly-victimisation experiences of affected young people, it is possible to argue here that children who are known to the child protection system may represent a meaningful portion of poly-victims, and likewise, represent young people to whom
prevention resources could be well directed. Future research examining this possibility could result in policy recommendations for child protection services to consider the broader developmental context of maltreated children with particular reference to their poly-victimisation experiences which extend beyond childhood maltreatment subtypes to include bullying and property and assault victimisation. Likewise, as noted earlier, the results of this thesis provide added to support to existing calls for a national incidence study in Australia which incorporates large-scale self-report data of a range of life-course victimisation experiences and developmental outcomes (Child Family Community Australia, 2014; Higgins, 2004a).

8.7 Conclusion

The goal of this thesis was to extend existing research regarding the links between maltreatment and offending through consideration of numerous maltreatment dimensions and historical context, as indicated by developmental systems theory and developmental and life-course criminology. The results of this thesis have successfully illustrated the complex and heterogeneous nature of child maltreatment across the life-course, and its links with youth offending. In particular, the results of the three studies have highlighted the need for analytical approaches which simultaneously reflect the complex nature of maltreatment across the life-course, whilst also delineating the unique contribution of single maltreatment dimensions to youth offending outcomes. The results of this thesis also indicate the need to consider the impact of gender and Indigenous status on maltreatment and offending links.

Overall, this thesis provides a valuable contribution to the current literature base regarding the links between child maltreatment and youth offending. Most importantly, the primary message of this thesis is that future research efforts regarding maltreatment and offending links must incorporate numerous maltreatment dimensions, and consider potential interactions between these variables across the life-course. Researchers exploring the links between child maltreatment and youth offending should no longer rely on simplistic conceptualisation of child maltreatment. Rather, these researchers should incorporate the growing body of research which highlights the heterogeneous nature of maltreatment across the life-course and its complex links to a range of developmental outcomes. Complex conceptualisation of maltreatment has the potential
to identify appropriate prevention and intervention strategies to improve the outcomes for maltreated children.
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