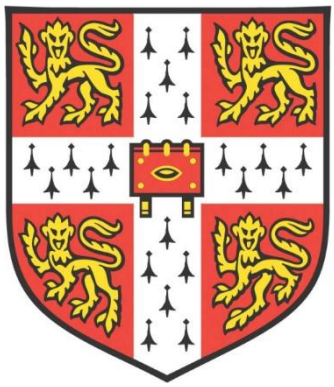
Criminal Offending and Mental Disorders

Long-term bidirectional and intergenerational effects between mental health problems and offending behaviour



Kim Reising

Pembroke College

Institute of Criminology

University of Cambridge

This thesis is submitted for the degree of

Doctor of Philosophy.

30th September 2020

Declaration

This thesis is the result of my own work and includes nothing which is the outcome of work done in collaboration except as specified in the text. I further state that no substantial part of my thesis has already been submitted, or, is being concurrently submitted for any such degree, diploma or other qualification at the University of Cambridge or any other University or similar institution except as specified in the text.

Part of this work has been presented in the following publications:

(1) Reising, K., Ttofi, M. M., Farrington, D. P., & Piquero, A. R. (2019). The impact of longitudinal offending trajectories on mental health: Lifetime consequences and intergenerational transfer. *Journal of Criminal Justice*, *62*, 16–22.
(2) Reising, K., Ttofi, M. M., Farrington, D. P., & Piquero, A. R. (2019). Depression and anxiety outcomes of offending trajectories: A systematic review of prospective longitudinal studies. *Journal of Criminal Justice*, *62*, 3–15.
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For all three papers, I was the lead investigator, responsible for all major areas of concept formation, data analysis, as well as manuscript composition. Ttofi, M. M. and Farrington, D. P. were involved in the early stages of concept formation and contributed to manuscript editing. Piquero, A. R. and Coid, J. W. contributed to manuscript editing.

In accordance with the Department of Law guidelines, this thesis, including footnotes, does not exceed the permitted length.

30/09/2020

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Kim Reising
Cambridge

Criminal Offending and Mental Disorders:

Long-term bidirectional and intergenerational effects between mental health problems and offending behaviour

Kim Reising

Abstract

Objective. The relationship between crime and mental disorders has long been a topic of debate. While in public perception these two phenomena are often seen as inextricably linked, research has painted a more complex picture, with only little consensus about the precise nature of the association. The aim of this thesis is to further unravel the interrelations between offending and mental disorders and to contribute to a more comprehensive understanding of their association over the life-course.

Methods. First, a broader view is adopted as a strategy to assess the current understanding of the relationship. Then, a more specific stance is taken within the theoretical framework of developmental and life-course criminology in order (1) to link research into offending pathways with the study of longitudinal effects and intergenerational transmission of mental health problems and (2) to investigate the link between family socio-psychological factors, violence, and personality disorders over the life-course by using different quantitative methods and drawing on data from the Cambridge Study in Delinquent Development.

Results. Having drawn attention to the importance of studying different offending pathways in the development of mental health problems, the considerable heterogeneity of mental disorder symptoms, and the role of early-life family context, findings demonstrate (1) that those with more severe offending pathways have an overall greater vulnerability to developing internalising problems in middle adulthood, (2) that certain personality disorder symptoms, specifically cluster A and cluster B disorders, are associated with lifetime violent behaviour, and (3) that early life paternal offending is associated with adult children's internalising and externalising problems.

Conclusions. It is suggested that early-life interventions targeting families as part of their work can play an important role in preventing the development of both later-life internalising and externalising problems. Further, results highlight the importance of recognising the heterogeneity of people with internalising and externalising problems in order to offer responses that are effectively tailored to an individual's needs. Finally, the thesis supports further efforts to improve mental health awareness and knowledge to reduce stigma.

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1 Criminology and Deviance

The relationship between crime and mental disorders has long been a topic of debate, both within the scientific community and the wider public. Each phenomenon is seen as a deviation from "normality", although in different ways and each is potentially destructive, whether to society or to the individual. Thus, the relationship between the two is of major interest, not only for those involved in the criminal justice and mental health systems, but also for policy and practice, and society at large.

The study of deviance spans many disciplines, including criminology, sociology, psychology, and psychiatry. Criminology typically focuses on the specific form of deviance called crime, which encompasses the violation of norms and rules written into law. Psychiatry, in turn, concerns itself with another form of deviance, known as mental disorders, which can be understood as a violation of the norm of having "normal" mental health.

In its basic form, the concept of deviance only indicates that an individual's behaviour, cognition, or affect is different from what is normally expected or considered acceptable. However, in its popular usage, the term often has a negative connotation, suggesting a degree of dysfunction or social undesirability. This "dilemma of difference"[1] is of major relevance because labels of deviance are often closely tied to stigma (Becker, 1963; Lemert, 1967), which facilitates the association of people with unfavourable or disapproved behaviours. Stigma shapes peoples' experiences and affects how others perceive them. These rather complex social processes have been linked to fear, lack of information, interpersonal divide, or stereotyping. In the end, however, they always mean that individuals, who are perceived to be different in some way, are rejected by greater society, often leading to isolation and social disconnection, which carries its own devastating health effects, because as human beings "people need social bonds not only to thrive but to merely survive" (Gable & Bromberg, 2018).

With its position and influence in contemporary society, mainstream media plays a central role in the process of reflecting and shaping prevailing currents of thought. Notably, media coverage of people with mental health problems tends to focus on events such as crime

[1] Minow (1990) conceptualised the term "dilemma of difference" in relation to how schools serve for children with special needs. In this context, the term is used in a broader sense, referring to the dilemma that individuals may experience due to being perceived as different by others, regardless of what exactly it is that constitutes the difference.

and violence (Carmichael, Adamson, Sitter, & Whitley, 2019), thereby reinforcing perceptions of people with mental disorders as being dangerous and contributing to generating a culture of fear. As such, people with specific problems do not only carry the burden of being different – in addition to the daily management of their symptoms – but are also likely to experience the consequences of being perceived as dangerous and a threat to community safety.

It is beyond question that criminality and mental disorders each have destructive elements and that both create a heavy economic and social burden. Specifically, violence and untreated mental health problems are serious public health concerns, with globally at least one out of five individuals experiencing a mental health problem in any given year (Patel, Flisher, Nikapota, & Malhotra, 2008; Steel et al., 2014; Wittchen & Jacobi, 2005) and a large number of violence acts that, for instance, in 2017 resulted in some 464,000 deaths (Vienna, 2019; see also Krug & Dahlberg, 2006). It should be kept in mind, however, that despite these numbers, an overestimation of the problem has tremendous consequences for individuals, possibly leading to stigmatisation, social isolation, detention, increased medication, and longer prison sentences, among others. Therefore, a comprehensive understanding of the relationship between crime and mental disorders is of uttermost importance, not only for policy and practice, but particularly for those involved in criminal justice and mental health systems.

The association between mental disorders and crime is not only a topic of media interest, but has also long been debated within academia, both in context of clinical practice and criminal justice. As discussed above, the study of deviance spans many scientific disciplines and as such research focuses and approaches vary considerably. However, in recent years the various disciplines have started to discover the benefits of joining their intellectual forces in investigating this topic of common interest. Overall, there is a long history of interference between law and psychiatry. While, traditionally, sociological, and psychological approaches within criminology focus on explaining crime and criminal behaviour, they have also made substantial contributions to the development of concepts such as diminished responsibility. Conversely, psychiatry applies its clinical expertise in legal contexts and areas such as risk assessment and treatment of behavioural problems, including offending.

These scientific disciplines are extremely diverse within themselves and comprise psychological, sociological, and biological perspectives, approaches, and research methods. As such, there is substantial overlap between the disciplines, which presents a great

opportunity for cross-disciplinary collaboration and the integration of research frameworks and ideas from the various fields of the social and medical sciences in order to further advance knowledge about the interrelations between crime and mental disorders, which, in fact, is a multifaceted research area (see also Ahonen, 2019). Within criminology, the developmental and life-course perspective (see e.g., Piquero, 2015 for a review) offers a unique opportunity to take this fact into account as it enables wide exploration by incorporating concepts from sociology, criminology, and psychology to provide explanations about long-term processes and interrelations of various phenomena that can affect an individual over the life-course, including mental health problems. It is suggested that research on the association between mental health and criminal behaviour will profit from the incorporation of life-course principles.

In order to advance knowledge and gain a deeper understanding of the relationship between offending and mental disorders, this thesis approaches the topic from different perspectives by exploring research across correctional, clinical and community settings, using different quantitative methods and drawing on data from community-based research projects for further analyses. Initially, a broad view is adopted as a strategy to detect patterns in order to assess the current understanding of the association. Then, a more specific stance is taken within the theoretical framework of developmental and life-course criminology in order (1) to link research into offending pathways with the study of longitudinal effects and intergenerational transmission of mental health problems (i.e., anxiety and depression) (Paper I and Paper II) and (2) to investigate the link between family socio-psychological factors, violence, and personality disorders over the life-course by using data from the Cambridge Study in Delinquent Development (Paper III).

Due to the choice of data, the definitions of crime and mental disorders in this thesis are of pragmatic nature, following official diagnostic manuals and crime-recording practices. This will be evident in the subsequent chapters which provide a brief overview of the mental disorders referred to in this thesis (Chapter 2) and a brief definition of crime (Chapter 3). Chapter 4 presents a review of the literature on the association between mental disorders and offending, covering clinical, correctional and community research, which leads to the aims of the present thesis followed by an introduction to the theoretical framework that guides the investigation (Chapter 5). The chapter begins with a general discussion of the developmental and life-course perspective within criminology and concludes with suggestions for the integration of the concept of mental disorders. Chapter 6 to Chapter 8 address the identified gaps within current research and theoretical understanding by employing data from a

community-based prospective longitudinal study to examine more specifically (1) anxiety and depression outcomes of distinct offender trajectories (Paper I and Paper II), (2) the intergenerational transmission of offending behaviour and certain mental health problems (Paper II), (3) the association between personality disorder symptoms and violence over the life-course (Paper III) and (4) childhood risk factors for specific personality disorders related to violence (Paper III). Finally, Chapter 9 and Chapter 10 conclude with a discussion of the most important results and main themes that emerged from the papers and review of the literature in order draw some overall conclusions about the association between crime and mental disorders, the implications for policy and practice and future research.

2 Introduction to Mental Disorders

Mental health is as important as physical health to the overall well-being of individuals and society. The term mental health has been defined variously and cultural dynamics play an important role in shaping its perception and conceptualisation (e.g., Gopalkrishnan, 2018; Marsella, & Yamada, 2000). Concepts include "subjective well-being, perceived self-efficacy, autonomy, competence, intergenerational dependence, and self-actualisation of one's intellectual and emotional potential" (WHO, 2001). A general understanding of mental health and, in particular, mental functioning is important because it provides the fundamental basis for a more comprehensive understanding of the development of mental and behavioural disorders. Mental health refers to people's emotional, psychological, and social well-being. It affects how people think, feel and act and shapes how they handle stress, relate to others, and make choices. The World Health Organization (WHO) defines mental health as "a state of well-being in which every individual realises his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (WHO, 2018).

This state, however, is estimated to be disrupted in approximately one of every five individuals at some point in their lives (Steel et al., 2014). Mental disorders affect the well-being and lives of millions of people all over the world. The exact number of people who suffer from some form of mental disorder is not known, but in 2001 the WHO estimated that 450 million people globally will have a mental disorder over the course of their lives. According to a more recent estimate, the Global Burden of Disease (GBD) Study of 2017 presumed that approximately 792 million people live with a mental disorder (Ritchie, & Roser, 2018). This implies that on any particular day, some 10% of all adults throughout the world are experiencing a mental disorder. While many people seem to escape such problems, many others do not, which makes mental health an important social concern (WHO, 2018).

The true prevalence of mental disorders globally remains poorly understood, mainly due to problems of definition and measurement. Practically everyone feels sad, depressed, or anxious at times. Such feelings are often considered a normal response to difficult life experiences and an integral part of being human. Therefore, the extent to which such moods and feelings actually constitute a clinical case of a mental disorder is subject to debate. Apart from that, mental health problems are often underreported. Although the number of patients receiving treatment in psychiatric hospitals and outpatient mental health facilities can be

determined, investigators face various problems in obtaining reliable data on the extent of mental health problems in non-institutionalised populations.

Despite these complex challenges, growing evidence shows that mental disorders are a major global problem with considerable associated social and economic costs. Above all, mental disorders have a significant impact on the individuals affected and on others within their social networks. Those suffering from mental health problems often have a significantly reduced life expectancy, face pervasive stigma and discrimination, are more likely to be unemployed, have damaged social relationships, and experience coexisting alcohol or drug use problems (e.g., Chesney, Goodwin, & Fazel, 2014; Fergusson, & Woodward, 2002; Whiteford et al., 2013). Further, there are also physical and mental health effects on caregivers and other family members (e.g., Avison, 1999; Schulz, & Sherwood, 2008). Before proceeding to a more detailed examination of some of the consequences of mental disorders, it is essential to define the concept of mental disorders first.

2.1 Defining Mental Disorders

Historically, the concept of mental disorders has been associated with supernatural, somatogenic[2] or psychogenic[3] theories and models. With changing perceptions, theoretical frameworks have undergone a series of transformations throughout history and, as a consequence, numerous definitions of mental disorders have been offered (see e.g., Aucouturier & Demazeux, 2003 for a review).

Defining exactly what constitutes a mental disorder is a challenging task and, interestingly, most standard textbooks in psychiatry, as well as the first two editions of the popular and widely used Diagnostic and Statistical Manual of Mental Disorders (DSM), did not offer a general definition. In an attempt to resolve this situation, Robert Spitzer formulated a more precise concept for the American Psychiatric Association (APA), which included a formal definition of mental disorder, published in the third edition of the DSM:

> In the DSM-III, each of the mental disorders is conceptualized as a clinically significant behavioral or psychological syndrome or pattern that occurs in an individual and that is typically associated with either a painful symptom (distress) or

[2] Somatogenic perspective: Abnormal psychological functioning has physical origins, i.e., mental disorders are seen as a result of biological disorders in the brain (e.g., Emil Kraepelin, 1856-1926).

[3] Psychogenic perspective: Abnormal psychological functioning has psychological origins (e.g., Sigmund Freud, 1856-1939).

> impairment in one or more important areas of functioning (disability). In addition, there is an inference that there is a behavioural, psychological, or biological dysfunction, and that the disturbance is not only in the relationship between the individual and society (APA, 1980, p. 6).

This definition was designed to address various challenges that psychiatry faced during the 1960s and 1970s. In particular, it was meant to serve as a starting point for a more descriptive, atheoretical classification of mental disorders and to counter the arguments of the anti-psychiatry movement, which claimed that psychiatry was more oriented to social and ethical values rather than medical facts (Telles-Correia, 2017, 2018). The DSM-III definition was a first attempt to formally conceptualise mental disorders by introducing operational diagnostic criteria, which stressed the importance of the harm criteria in the form of distress or disability, along with the criteria of a mental dysfunction. This definition remained largely unchanged in subsequent revisions of the DSM and it has been widely adopted by psychiatry in general (APA, 1994, 2000).

Since the introduction of diagnostic manuals, they have contributed extensively towards a common international language for defining and conceptualising mental disorders. The two dominant and internationally best-known diagnostic manuals are the previously mentioned Diagnostic and Statistical Manual of Mental Disorders (DSM; APA, 2013) and the International Statistical Classification of Diseases and Related Health Problems (ICD; WHO, 2019).

The DSM is a manual for the classification of mental disorders published by the APA. Despite their attempt to provide a formal definition, APA has acknowledged that defining what constitutes a mental disorder is difficult. They addressed this problem of terminology in their fourth edition of the DSM by noting that "[a]lthough this manual provides classification of mental disorders, it must be admitted that no definition adequately specifies precise boundaries for the concept of 'mental disorder'" (APA, 1994, p. xxi). In line with that, the latest edition of the DSM (APA, 2013) states that there is no single consensus on the operational definition of mental disorders and therefore it provides a list of minimal criteria that must be met for a condition to be called a mental disorder. According to the DSM-5,

> [a] mental disorder is a syndrome characterised by clinically significant disturbance in an individual's cognition, emotion regulation, or behavior that reflects a dysfunction in the psychological, biological, or developmental processes underlying *mental functioning*. Mental disorders are usually associated with significant *distress* in social,

> occupational, or other important activities. An expectable or culturally approved response to a common stressor or loss, such as the death of a loved one, is not a mental disorder. Socially deviant behavior (e.g., political, religious, or sexual) and conflicts that are primarily between the individual and society are not mental disorders unless the deviance or conflict results from a dysfunction in the individual, as described above [emphasis added]. (APA, 2013, p. 20).

Another widely used diagnostic manual is the ICD, a standard diagnostic classification system for a variety of health conditions published by the WHO. The ICD-10 (WHO, 1992) has been in use since 1994 and, similar to the DSM, it acknowledges the problem of terminology by stating that the term mental disorder is "not an exact term", but is used to:

> imply the existence of a clinically recognizable set of symptoms or behaviour associated in most cases with *distress* and with interference with *personal functions*. Social deviance or conflict alone, without personal dysfunction, should not be included in mental disorder as defined [emphasis added]. (WHO 1992, p. 5).

Although the ICD-10 contains only a brief definition of the term mental disorder, it differs only slightly from the definition provided in the DSM-5. Both manuals describe mental disorders as conditions that are associated with distress and manifest mental dysfunctions and are not merely an expected response to a particular life event.

Diagnostic manuals are used by clinicians and researchers to diagnose and classify mental disorders. For each disorder, a set of diagnostic criteria, essentially a checklist of features, indicates symptoms that must be present to qualify for a particular diagnosis. These symptoms typically detail some characteristic traits, attitudes, or behaviours that are strongly related to that particular disorder. Where many of the symptoms occur together, they are assumed to constitute a mental disorder. The following section provides an overview of those mental disorders examined in this thesis.

2.2 Types of Mental Disorders

The diagnostic manuals provide clinical descriptions of a wide range of mental disorders and assist clinicians and researchers in arriving at consistent diagnoses. Each psychiatric condition is categorised and given a relatively clear set of criteria that must be met for a diagnosis to be made. The following is a summary of those mental disorders examined in this thesis and how they are diagnosed.

2.2.1 Schizophrenia

Schizophrenia is a chronic mental disorder characterised by distortions in thinking, perception, emotions, language, the sense of self and behaviour (WHO, 2019). Symptoms are typically conceptualised in terms of positive and negative symptoms. Positive symptoms include delusions (i.e., fixed false beliefs), hallucinations (i.e., hearing voices or seeing things that are not there), or disorganised speech and behaviour, experiences which are usually present in people during a psychotic episode. Negative symptoms include deficits in normal emotional responses, including marked apathy or disconnection between reported emotions and what is observed such as facial expression or body language. The most general symptoms of schizophrenia tend to appear in adolescence or early adulthood, typically between the ages of 16 and 30 (National Institute of Mental Health, 2016; APA, 2013). The onset of schizophrenia is usually defined as the time when the first positive symptoms of psychosis occur or are noted and is known as first episode psychosis (FEP).

Schizophrenia is described in both diagnostic classification manuals, the DSM-5 and ICD-10. To date, no reliable biomarkers for schizophrenia have been identified and clinical assessment is performed by qualified practitioners based on observed behaviour and reported experiences (e.g., Perkovic et al., 2017; Weickert, Weickert, Pollai, & Buckley, 2013). The DSM-5 states that, to be diagnosed with schizophrenia, the individual must meet at least two criteria over a period of one month with significant disturbance and persistent impact on self-care and social or occupational functioning for at least six months. At least one of the symptoms must be a positive symptom, while the second symptom can be one of the negative symptoms (APA, 2013). The ICD-10 lists as the most important symptoms in people with schizophrenia “thought echo, thought insertion or withdrawal, thought broadcasting, delusional perception and delusions of control, influence or passivity, hallucinatory voices commenting or discussing the patient in the third person, thought disorders and negative symptoms” (ICD-10; WHO, 2019). The requirement for a diagnosis according to the ICD-10 is the presence of one very clear positive symptom or two other symptoms including, for instance, negative symptoms such as marked apathy or severe catatonic behaviour for most of the time during a period of one month or more (WHO, 2019).

2.2.2 Mood disorders

Mood disorders are a group of psychiatric conditions in which a fundamental disturbance in an individual’s mood is the main underlying feature. Two of the most common mood disorders are depression and bipolar disorder.

Major depressive disorder. Major depressive disorder, commonly called depression, is a mood disorder where individuals experience persistent feelings of sadness and hopelessness, often accompanied by a loss of interest or pleasure in most or all activities they once enjoyed. A depressive episode is typically defined as a period of at least two weeks in which a person experiences depressive symptoms on most days (WHO, 2020). Depression is a psychiatric condition that can begin at any age, though people are most likely to develop a first major depressive episode between the ages of 30 and 40. However, no age group seems to be exempt from depression. Studies have shown that approximately eight out of ten people who experience a major depressive episode will have at least one more during the course of their lives (Fava, Park, & Sonino, 2014).

Major depressive disorder is described in both diagnostic classification manuals, the DSM-5 and ICD-10. To date, there are a few potential biomarkers, but no laboratory tests can confirm a major depressive disorder. Assessment is typically conducted based on observed behaviour and reported experiences by a qualified practitioner. According to the DSM-5, major depressive disorder is particularly characterised by the following symptoms: depressed mood, markedly diminished interest in all, or almost all, daily activities, significant change of weight or appetite, insomnia or hypersomnia, fatigue or loss of energy, feelings of worthlessness or excessive guilt, decreased concentration, and recurrent thoughts of death or suicidal ideation (APA, 2013). If at least five of these symptoms are present within a two-week period, with one of them being either depressed mood or anhedonia (i.e., reduced ability to experience pleasure, or a diminished interest in pleasurable activities), and if these symptoms significantly affect the person's previous level of functioning, then mental health professionals refer to this condition as major depressive disorder (APA 2013, p. 160).

The ICD-10 postulates that all forms of depressive disorder (i.e., mild, moderate and severe) are characterised by experiences of the following symptoms: depressive episodes, low mood, reduced energy and capacity for enjoyment, interest and concentration, marked tiredness, disturbed sleep and appetite, reduced self-esteem and self-confidence, and ideas of guilt and worthlessness (WHO, 2019). To determine a moderate depressive disorder diagnosis according to the ICD-10, four or more of these symptoms must be present and the individual needs to show great difficulty in continuing daily activities (WHO, 2019).

Bipolar Disorder. Bipolar disorder, also known as manic-depressive disorder, is a mood disorder in which people experience alternating episodes of depression and mania (Phillips, & Kupfer, 2013). Symptoms of the depressive phase are typically the same as those

experienced in the classic depressive disorder. The manic phase, on the contrary, is a distinct period of abnormally and persistently elevated, expansive, or irritable mood (APA, 2013), in which an individual experiences feelings of heightened energy and euphoria, with symptoms including persistent excitement, feelings of restlessness, less need for sleep and grandiosity or delusional ideas. Mania is also associated with exaggerated self-esteem, uncontrollable racing thoughts, pressured speech and increased impulsive or high-risk behaviour. Individuals may also experience a mixed bipolar episode during which symptoms of both depression and mania occur simultaneously or alternate rapidly (Swann et al., 2013). An example might be someone in a hyperactive mood who has feelings of excessive guilt or someone who may be crying uncontrollably but at the same time is fixated on working on a task that needs to be done. Further, psychotic symptoms, such as delusions or hallucinations, may also occur in the depressive and manic phases of bipolar disorder. In classification manuals, bipolar disorder often falls between schizophrenia and depressive disorder "in recognition of their place as bridge between the two diagnostic classes in terms of symptomatology" (APA, 2013, p. 123). Bipolar disorder is commonly diagnosed during adolescence or early adulthood, but its onset can occur throughout life (APA, 2013, pp. 123-154).

Bipolar disorder is described in both diagnostic manuals, the DSM-5 and ICD-10, and assessed based on self-reported experiences and observable symptoms by a mental health professional. According to the DSM-5, a diagnosis of bipolar disorder requires at least one episode of mania lasting for at least one week and being present most of the day, nearly every day (APA, 2013). During that period three or more of the following symptoms must be present and lead to marked impairment in social or occupational functioning: grandiosity, less need for sleep, racing thoughts, pressured speech, increased distractibility, high goal-directed activity and involvement in high-risk behaviour. A history of a major depressive episode is not required for a diagnosis, but it is typically expected that such an episode will occur in the majority of individuals with bipolar disorder (APA, 2013). The ICD-10 diagnostic criteria are mostly equivalent to those of the DSM-5. Bipolar disorder is characterised as a mood disturbance consisting of multiple episodes of mania and depression. A diagnosis requires at least two episodes of mood disorder, with at least one of them being manic (WHO, 1992). For the diagnosis of a manic episode, the individual's mood needs to be markedly elevated for at least one week, and three or more of the classic symptoms must be present. To be diagnosed with bipolar disorder, the individual can either be currently manic with a history of depressive episodes or currently depressed with at least one manic or mixed bipolar episode in the past.

2.2.3 Anxiety disorders

Anxiety disorders are a group of psychiatric conditions that include fears (phobias) or anxiety symptoms. In clinical usage, fears are considered to be an emotional or physical response to a specific stimulus, while anxiety is defined as a persistent, unpleasant emotional state for which the cause is either not yet identified or perceived to be uncontrollable (e.g., Barlow, 2002). The major types of anxiety disorders are generalised anxiety disorder, posttraumatic stress disorder, obsessive compulsive disorder, and social anxiety disorder. Generalised anxiety disorder is a relatively common disorder characterised by long-lasting excessive worry, which is often non-specific and accompanied by "restlessness, fatigue, concentration problems, irritability, muscle tensions, and sleep disturbance" (Schacter, Gilbert, & Wegner, 2011). Posttraumatic stress disorder is a disorder that develops in some people who have experienced very stressful, frightening, or distressing events (NHS, 2018) and social anxiety disorder, also known as social phobia, is a common condition that is characterised by long-term and overwhelming fear of social situations (NHS, 2020). The ages of onset of anxiety disorders range from early adolescence to young adulthood, with most people being diagnosed before age 25 (Legerstee et al., 2019; Lijster et al., 2017).

Anxiety disorders are described in both diagnostic manuals, the DSM-5 and ICD-10. To date, there are no objective biomarkers, and diagnoses are based on observable symptoms which typically need to be present for at least six months and negatively impact the individual's daily functioning (Craske, & Stein, 2016). The DSM-5 diagnostic criteria states that to be diagnosed with generalised anxiety disorder an individual must experience excessive anxiety and worry about a number of events or activities for at least six months (APA, 2013). The individual must find it challenging to manage the anxiety which is associated with at least three of the following symptoms: restlessness, feeling fatigued, problems concentrating, irritability, muscle tension or difficulty sleeping. The symptoms must lead to significant distress and cause problems in social, occupational, or other important areas of functioning. According to the ICD-10, generalised anxiety disorder is described as anxiety that is generalised and persistent but not restricted to a specific stimulus. The dominant symptoms include persistent nervousness, trembling, muscular tensions, sweating, light-headedness, dizziness, and epigastric discomfort (WHO, 2019). For the diagnosis of generalised anxiety disorder, the individual must experience tension, worry and feelings of apprehension about everyday events, typically for a period of at least six months.

2.2.4 Personality disorders

Personality, defined psychologically, is an abstract concept that refers to complex "patterns of thinking, feeling and behaving" which distinguish individual humans (Kazdin, 2000). An individual's personality is influenced by experiences, environment, and inherent characteristics and considered to be both relatively stable and changeable, although the degree of change is specific to each person (e.g., Damien, Spengler, Sutu, & Roberts, 2019). Personality is often described as a pattern of deeply embedded psychological characteristics which are largely unconscious and express themselves automatically in almost every area of functioning (e.g., Millon 1981). Personality disorders are characterised by enduring patterns of thinking, feeling, and behaving, exhibited across many contexts and deviating from those expected or accepted by the individual's culture.

Official criteria for diagnosing personality disorders are listed in both diagnostic manuals, the DSM-5 and ICD-10. Diagnoses are typically based on self-reported experiences and observable symptoms are assessed by a psychiatrist in a process involving a structured clinical interview with a scoring system, for example, the SCID-II (First, Spitzer, Gibbon, Williams, & Benjamin, 1996) as a screener. Both classification systems provide a short list of criteria that should be met by all personality disorder cases before a more specific diagnosis is made. A diagnosis of personality disorder in general requires: an enduring and pervasive pattern of inner experience and behaviour that affects several areas of functioning, including cognition, affectivity, interpersonal functioning, or impulse control and leads to significant personal distress or impairment in social or occupational performance (APA, 2013; WHO, 2019). Importantly, the ICD-10 states that "[f]or different cultures it may be necessary to develop specific sets of criteria with regard to social norms, rules, and obligations" (WHO, 1992, p. 202).

The DSM-5 lists ten specific personality disorders: paranoid, schizoid, schizotypal, antisocial, borderline, histrionic, narcissistic, avoidant, dependent and obsessive-compulsive personality disorder. It also contains three diagnosis for personality patterns not matching these ten disorders, but nevertheless exhibiting characteristics of a personality disorder, including personality change due to a medical condition, other specified disorder and unspecified personality disorder (APA, 2013, pp. 234-236). The ICD-10 lists eight specific personality disorders: paranoid, schizoid, dissocial, emotionally unstable, histrionic, anankastic, anxious, dependent, and four diagnoses for other personality patterns including: other specific personality disorder, unspecific personality disorder, mixed personality

disorders and troublesome personality changes (WHO 1992, p. 34). In the forthcoming ICD-11 all discrete personality disorder categories will be replaced by a single diagnosis of "personality disorder", while giving practitioners the option to classify three levels of severity and to specify one or more trait domain qualifiers (WHO, 2019). The following is a brief overview of the ten personality disorders examined in this thesis.

Paranoid. Paranoid personality disorder is characterised by a pattern of irrational suspicion and pervasive feelings of mistrust. Individuals with paranoid personality disorder are often guarded and defensive, persistently perceiving interpersonal threats and danger without sufficient justification. They experience difficulties in forming relationships and are often perceived as overly sensitive to setbacks and unforgiving of insults. They tend to have a combative and tenacious sense of personal rights and easily feel shame and humiliation (Lewis, & Ridenour, 2017; WHO, 2019).

Schizoid. Schizoid personality disorder is characterised by withdrawal from affectional and social relationships. Individuals with schizoid personality disorder are often detached, prefer to be alone and are prone to introspection. They are often perceived as apathetic, indifferent, and distant, due to a limited capacity to express emotions. Despite their reluctance to form close relationships, schizoid individuals are generally well functioning (WHO, 2019; Mayo, 2016).

Schizotypal. Schizotypal personality disorder is a condition that is only listed as such in the DSM-5, while the ICD-10 uses the term "schizotypal disorder" and classifies it as a clinical disorder associated with schizophrenia. In the DSM-5, schizotypal personality disorder is defined as a "pervasive pattern of social and interpersonal deficits marked by […] cognitive or perceptual distortions and eccentricities of behavior" (APA, 2013, pp. 655-659). People with schizotypal personality disorder are often described as odd or eccentric, and experience extreme difficulties in interacting socially and forming relationships, which typically stem from experiencing paranoia. They tend to hold peculiar beliefs and have abnormal perceptual thinking (APA, 2013; Mayo, 2016).

Antisocial. Antisocial or dissocial personality disorder is characterised by a pervasive pattern of disregard for morals, social norms and the rights and feelings of others (Mayo, 2016). People with antisocial or dissocial personality disorder are often perceived as irresponsible, impulsive, aggressive, manipulative, and lacking feelings of guilt. Their behaviour patterns often lead to conflicts with society (APA, 2013; WHO, 2019).

Borderline. Borderline personality disorder, also known as emotionally unstable personality disorder, is a condition that impacts the way individuals think and feel about themselves and others. Individuals with borderline personality disorder tend to lack a sense of self and experience feelings of ongoing emptiness. They are often perceived as unpredictable, impulsive, and unstable due to rapidly fluctuating moods. They fear abandonment, often engage in manipulative behaviours, and have patterns of instability in personal relationships (APA 2013; WHO, 2019).

Histrionic. Histrionic personality disorder is a pattern of constant attention-seeking behaviour and exaggerated expression of emotions. People with histrionic personality disorder lack a sense of self-worth and depend on the approval of others for their wellbeing. They may use physical appearance to draw attention to themselves and often tend to be overly charming and dramatic, as well as inappropriately seductive and stimulation seeking (APA, 2013; WHO, 2019; Mayo 2016).

Narcissistic. Narcissistic personality disorder is associated with an extreme sense of self-importance (grandiosity), a deep need for attention and admiration, and a lack of empathy for others. People with narcissistic personality disorder are often perceived as egotistical, arrogant, and pretentious. At the same time, they have trouble handling anything they perceive as criticism and often experience interpersonal problems. They have difficulty in regulating emotions and often show destructive anger (also known as narcissistic rage) when experiencing a setback or perceived criticism, which endangers their illusion of superiority and is believed to trigger feelings of inadequacy (APA, 2013; Mayo, 2016).

Avoidant. Avoidant personality disorder is characterised by pervasive feelings of social inhibition and inadequacy. Individuals with avoidant personality disorder are typically preoccupied with their own shortcomings and tend to believe that they are socially inept or inferior. Because of longstanding feelings of inadequacy, they are very self-conscious and excessively monitor their internal reactions, which often prevents them from engaging in social situations. Their main coping mechanisms are avoidance of fear inducing stimuli and habitually exaggerating the potential risk in everyday situations. Individuals with avoidant personality disorder are often perceived as shy, anxious, and tense in social situations (APA, 2013; WHO, 2019).

Dependent. Dependent personality disorder is characterised by a pattern of excessive dependence on other people and an excessive need to be taken care of. People with dependent personality disorder are often perceived as passive, submissive, and clingy. They tend to see

themselves as helpless or incompetent and have a great fear of being abandoned or separated from other important people in their lives (APA, 2013; WHO, 2019)

Obsessive-compulsive. Obsessive-compulsive personality disorder, or anankastic personality disorder, is characterised by an excessive preoccupation with orderliness, perfectionism, and mental as well as interpersonal control. Individuals with obsessive-compulsive personality disorder maintain a rule-bound lifestyle and adhere closely to social conventions. They tend to perceive themselves as devoted, efficient, and productive, while showing extreme perfectionism, which often results in dysfunction and distress when perfection is not achieved. Importantly, obsessive-compulsive personality disorder is not the same as obsessive-compulsive disorder, the previously mentioned anxiety disorder (see Section 2.2.3). The latter is defined by the presence of true obsessions and compulsions, which usually distress the individual, while people with obsessive compulsive personality disorder typically believe that their actions have aims and purposes (Mayo 2016; WHO 2019; APA 2013).

These ten specific personality disorders are typically grouped into three clusters based on similar characteristics and symptoms. In fact, research has shown that there is considerable personality disorder co-occurrence within but also across clusters. People who meet diagnostic criteria for one personality disorder are likely to also meet diagnostic criteria for another personality disorder (e.g., Sarkar 2019). The following is the categorisation of personality disorders as defined in the DSM-5 (APA, 2013).

Cluster A. Cluster A is characterised by odd or eccentric thinking and behaviour and includes paranoid, schizoid and schizotypal personality disorders. People with these disorders can be paranoid and often experience difficulty in social situations due to odd or eccentric modes of speaking and an inability to form or maintain close relationships (APA, 2013).

Cluster B. Cluster B is characterised by dramatic and overly emotional or unpredictable thinking and behaviour. This cluster comprises antisocial, borderline, histrionic and narcissistic personality disorders. People with cluster B personality disorders often experience problems with emotion regulation and interpersonal conflicts. The underlying theme for people with these personality disorders is often considered to be a lack of empathy for others (Kraus, & Reynolds, 2001).

Cluster C. Cluster C is characterised by anxious thinking and behaviour and includes avoidant, dependent, and obsessive-compulsive personality disorder. Individuals with cluster

C personality disorders are typically very cautious and fearful, socially withdrawn and tend to overthink (APA, 2013).

In addition to grouping personality disorders into clusters, it is also possible to sort them according to degrees of severity. Usually, the classification of personality disorders in the diagnostic manuals follows a categorical approach, which implies that personality disorders are discrete categories, distinct from each other and from normal personality. In contrast, the dimensional approach is an alternative model following the idea that personality disorders represent extreme extensions of the same traits that describe "normal personality". This approach is included in the DSM-5 section labelled "Alternative DSM-5 Model for Personality Disorders" (APA, 2013). Further, as previously mentioned, the forthcoming ICD-11 will include a reconceptualisation of the categorisation of personality disorders with a dimensional description based on the severity of disturbed functioning (WHO, 2019). According to the dimensional model, an individual can have various levels of specific characteristics, in contrast to the traditional categorical approach which is based on the mere presence or absence of symptoms. The advantages of this alternative approach are, in addition to subthreshold diagnoses, that it also allows for complex personality disorders in which different clusters of personality disorder symptoms are present. It can also establish the severity of the personality disorder, which may be particularly important for those at greater risk.

2.3 A Note on the Diagnosis of Mental Disorders

The diagnostic approach to mental health is not without controversies. Diagnostic classification systems like the DSM and ICD have been remarkably influential over the years and have made significant contributions to describing and classifying mental health problems. While they enhanced the reliability of diagnoses by making descriptions of symptoms as observational as possible, the diagnostic framework for mental disorders is often considered flawed, lacking definitions of, for example, what exactly it is that constitutes a dysfunction, and failing to address the basis of norms of psychological functioning.

The relevance of values and norms has always played a role in the discourse on mental disorders. Over the past decades, unacceptable bias has been repeatedly identified, exemplified in categories like homosexuality (Stoller et al., 1973, p. 1216). What is relevant here is specifically the question of whether values and norms are an inherent part of the definition and conceptualisation of mental disorders. Descriptions of symptoms often contain references to current normative social expectations, some explicit and others more implicit.

This is inevitable given that they are meant to be symptoms of *abnormal* functioning. However, it is particularly the status of these norms that has been controversial (see e.g., Kendell, 1986). Specifically, the question as to whether these norms of functioning are a matter of objective medical fact or rather are social norms. It is generally suggested that normality and abnormality cannot be differentiated objectively.

In an attempt to ensure that psychological conditions are not merely a matter of deviation from social norms, diagnostic manuals have added specific qualifications to their descriptions of symptoms. For a psychological condition to classify as a mental disorder there must be an underlying personal *dysfunction*, a failure of some internal psychological mechanism to perform its function. However, the translation of this dysfunction into operational terms poses some difficulties. In this context it is important to mention again that mental disorders are diagnosed based on behavioural criteria and not on tests of biological functioning. Hence, the clinical judgment about dysfunction involves assumptions about internal mechanisms and psychological normality and abnormality. For instance, the criteria for generalised anxiety disorder includes reference to "excessive anxiety and worry" (APA, 2013, 300.02). It seems that judgements as to whether worrying is excessive and, in fact, dysfunctional is a matter of social norms rather than medical facts.

For a psychological function to be judged abnormal, it must be compared with what is considered normal. Normal functioning is typically determined according to an average reference group and this process inevitably introduces values, particularly, when deviance from this average is classified as dysfunctional (Bolton, 2008). It is difficult to see why deviance from this group should be considered as a dysfunction rather than as just a difference. It remains unclear why it is expected that people should all function the same as some reference group. For a psychiatrist, distress may be easily recognisable, but judgement as to whether or not it is functional when, for instance, life circumstances are taken into account is subjective and requires interpretation. Likewise, it may be easy to determine the deviation from normal functioning of a reference group, but whether comparison with another group would lead to the same conclusions is speculative.

Problems surrounding the diagnosis of mental disorders are more or less the same now as they were during the heated debates over the distinction between mental health and mental disorders and psychological normality and abnormality in the 1960s and 1970s. In fact, already Durkheim (1895/1958) postulated that what is considered deviant does not depend on individual behaviour, but on norms and values that society uses to determine appropriate or

acceptable behavior. In line with that, Foucault (1965) argued that what constitutes "madness" is based on social factors and emerges through cultural categorisation of behaviour. This is not to reproduce the nature-culture dualism, nor to engage in a social versus biology debate, but rather to emphasise the importance of both domains in the conceptualisation of mental disorders. It is important to see both the underlying reality of mental health problems, while also recognising that their expressions, definitions, and classifications are influenced by culture.

As mentioned in the introduction to this chapter, the authors of the diagnostic manuals themselves acknowledge shortcomings of the diagnostic system. In the latest edition of the DSM, for instance, the authors stated that "there is no assumption that each category of mental disorder is a completely discrete entity with absolute boundaries dividing it from other mental disorders or from no mental disorder. There is also no assumption that all individuals described as having the same mental disorder are alike in all important ways" (APA, 2013, p. xxxi). It is unclear what is the purpose of categorisation, if not to separate observations from each other and to distinguish them from uncategorised cases.

Critics of the diagnostic approach to mental health problems often emphasise non-disorder options, stressing the fact that normality and pathology lie on a continuum, and point out that individuals' responses to their experiences may very well reflect individual variation as opposed to disorders. Again, this is not to question the underlying reality of psychiatric symptoms and the genuine suffering of people with mental health problems, but more to identify the social construction of mental disorder categories. People may be separated into categories according to explicit criteria, but the act of categorisation is, in fact, social.

As a final point, diagnostic labels may be helpful in the sense that individuals may feel like their problems have been recognised and validated and it could be assumed that accurately naming a condition may lead to more empathetic understanding and more effective responses. However, Moncrieff (2010) and others have shown that, overall, diagnostic labels are less useful than, for example, a detailed description of a person's problems. What is relevant here is that diagnostic labels are imbued with power and that they shape social reality, often before this reality is even experienced. It is important to note that the classification and explanation of mental health problems are undertakings which are independent of the type of symptoms that individuals experience. This observation has two implications for this thesis: first, the term disorder is used throughout rather than illness or

disease, and secondly, analyses will focus mainly on psychiatric symptoms rather than diagnostic categories, in an attempt to put more focus on peoples' lived experiences.

Accordingly, a mental disorder is understood as a health problem that significantly affects how a person thinks, feels, and behaves and interacts with other people. It is diagnosed to standardised criteria. A mental health problem also interferes with how a person thinks, feels, and behaves, but, assumingly, to a lesser extent than a mental disorder. It is suggested that subthreshold and full syndromic disorders can be considered as falling along a spectrum, with subthreshold disorders being viewed as quantitatively milder than, but qualitatively similar to, full syndromic disorders (Shankman et al., 2008). It is important that research also considers subsyndromal mental health problems as (1) it has been shown to be rather difficult to identify clinical criteria that delineate between full and subthreshold, (2) subthreshold symptoms have been found to impair functioning and diminish quality of life, too and (3) subthreshold cases are encountered frequently, and although they have been shown to predict the onset of full syndrome disorders over time (Shankman et al., 2009), their classification as "non-clinical" often leaves those individuals' needs unmet (Okasha, 2008). Thus, analyses in this dissertation focus mainly on subsyndromal mental health problems.

3 Introduction to Crime

Criminology and psychiatry share a common interest in deviance. Since ancient times, societies have been concerned with behavioural expectations and disruptions of the social order. In sociology, the concept of social order refers to, inter alia, the organisation of various interrelated parts of society maintained by shared standards, values, and norms (Durkheim, 1897/1951, 1925/1961). Hence, behaviours and beliefs that are counter to those of the social order are perceived as deviant. Traditionally, social deviance is defined as any behaviour that violates the prevailing social norms. Although there are several definitions (see e.g., Best, & Luckenbill, 1982 for a review), deviance generally refers to socially disapproved behaviour that violates the standards of a given group or the society in which it is carried out (e.g., Higgins, & Butler, 1982; Schaefer; Grekul & Haaland, 2017; Tittle, & Paternoster, 2000).

Norms are social expectations concerning what members of a group believe to be acceptable thought or behaviour in a particular situation (e.g., Knight Lapinski, & Rimal, 2005). As such, the concept of deviance is complex and will vary depending upon time, place, and situation. Although it often has a negative connotation, the violation of social norms is not always perceived as a negative act and may be classified as positive or acceptable in some situations (e.g., Bandura, 1973; Heckert, & Heckert, 2002). Typically, deviant behaviour can be divided into three kinds of acts: those that are treated with informal responses, those that are officially recognised as offences in, for instance, civil law, and those that are defined as crimes in the criminal law (i.e., formal deviance). Hence, not all behaviour that is considered deviant within a society will be labelled as crime as defined in the criminal law. In criminology, "the process by which behaviours and individuals are transformed into crime and criminals" (Michalowski, 1985, p. 6) is called criminalisation. Before proceeding with a brief overview of the behaviours that are considered crimes under current law, the next section of this chapter provides an insight into what constitutes crime, how the concept is defined and how the term is used in this thesis.

3.1 Defining Crime

Rules governing social life have been part of the social order of human communities since recorded times. The earliest evidence of a society that identified a set of rules governing social life is ancient Babylon's Code of Hammurabi (1772 BC) (e.g., Veenhof, 2003). Violations of these codes of conduct have also been part of the social experience since humans began living in groups. As communities became more densely populated and organised, behaviours that violated the social order were handled more formally and

eventually judiciously, leading to the codification of conduct into formal laws and the construction of what today is widely referred to as crimes.

Crime, so observed by Émile Durkheim (1895/1958), is present in all societies and an expected part of group living. He stated that "what is normal, simply, is the existence of criminality, provided that it attains and does not exceed, for each social type, a certain level" (p. 67). Durkheim (1895/1958) defined crime as acts that offend strongly held "collective sentiments" (p. 67). While violations of social norms are present in all societies, defining what constitutes a crime is challenging and interestingly most criminological textbooks and journal articles rarely consider it necessary to define what is meant by the term crime (Lynch, Stretesky, & Long 2015; Hillyard, & Tombs 2007).

Generally, crime is a social construct that reflects the norms and values of a given society at a given point in time and as such, its definition varies across time and place. For instance, homosexuality was illegal in the UK in the early twentieth century until it was, formally, decriminalised in 1967 in the Sexual Offences Act (e.g., Sutcliffe-Braithwaite, 2018). Further, in the context of culture, homosexuality may be legal in the UK today, but is still illegal in approximately 70 other countries worldwide and in at least eleven of those even punishable by death (ILGA, 2019).

Within criminology, different perspectives have been taken to define the concept of crime. However, in the traditional discourse, crimes have often been taken for granted as simply being acts that violate criminal law, which constitutes the basis for the so-called legalistic perspective. To date, only few have discussed the strengths and weaknesses of this approach (see e.g., Lynch, Stretesky, & Long, 2015; Tappan, 1946). Crime, according to the legalistic approach, is any behaviour prohibited by criminal law. As stated by Clark and Marshall (1900/1952), "crime is any act or omission prohibited by public law for the protection of the public, and made punishable by the state in a judicial proceeding in its own name" (p. 1). From this it follows that crime, defined as a behaviour classified as wrong by the criminal law, does not exist until these laws come into effect. Hence, it can be considered as a social and more specifically, a political construction (e.g., Barak, 1998; Henry, 2009).

The criminal law defines what conduct is classified as a crime and how individuals who commit criminal offences may be prosecuted. According to the criminal law, acts defined as crimes share specific elements. For instance, in the UK legal system, for a crime to occur it must have three elements: (1) a guilty or criminal act (*actus reus*), (2) a guilty mind (*mens*

rea)[4], and (3) the concurrence of these two. The *Actus reus* describes the physical element of committing a crime and can refer to either an action, the threat of an action or the omission of action. The *Mens rea* is the mental element of committing a crime and refers to the intention to commit an offence. Finally, under the law, for a crime to occur it requires that the criminal action coincides with a guilty mental state. The following section gives a brief overview of different types of crimes that are examined in this thesis.

3.2 Types of Crimes

There are many different types of crimes and various approaches to categorising them. In general, all offences may be classified as either *mala in se*, meaning evil in itself or as *mala prohibita*, referring to acts proscribed by law (e.g., Duff, 2002). The former describes criminal acts that are considered as inherently wrong in almost all societies, typically including crimes like murder, rape, and theft. The latter are criminal acts that are classified as wrong because they violate the law, and as such they can vary across time and place. Examples include, in addition to the previously mentioned case of homosexuality, the prosecution of witchcraft, the acceptance of duelling in history or the ban on the sale of chewing gum in Singapore.

Crimes can also be categorised based on subject matter, in the sense that they can be either crimes against property, crimes against the person or crimes against society (e.g., Lacey, & Zedner, 2012). For example, crimes like murder, rape and assault are typically classified as crimes against the person, because they are victim-based. Conversely, if a crime harms another person by depriving them of their property (e.g., theft) or by damaging their property, then it is typically classified as a crime against property. Crimes against society usually do not have a direct victim and do not involve actions directed against property. They include, for instance, drug offences or weapon law violations.

The following is a brief overview of the crime categories referred to in this thesis. Crime categories are presented within the previously described offence groupings. This categorisation is chosen primarily for convenience and to assist the organisation, but it is not essential in the study of crime.

[4] It should be noted, however, that while this is the rule, there are exceptions. Offences of strict liability do not require *mens rea* or even negligence as to one or more elements in the *actus reus* (Ormerod & Laird, 2018, p. 143).

3.2.1 Offences against property

Property crimes cover a range of criminal acts and generally involve unlawful interference (e.g., deprivation) with the property of another person. Many offences against property belong into the category of theft crimes.

Theft. Theft crimes are characterised as the taking of a person's property without their permission. In English and Welsh law, the offence of theft is defined under the Theft Act 1968 as "dishonestly appropriating property belonging to another with the intention to permanently depriving the other of it" (Theft Act, 1968). Theft includes, for instance, vehicle-related theft, which is described as either taking items belonging to someone else from or off a vehicle or taking the vehicle itself without consent. It further includes theft from automatic machines like parking meters or telephone boxes. People who are found guilty of shoplifting are also charged with theft under the Theft Act 1968. Shoplifting is defined as taking goods from a shop without paying for them first (Theft Act, 1968).

Robbery. Section 8 of the Theft Act 1968 specifies the offence of robbery (Theft Act, 1968). Robbery includes all offences in which a person steals, or attempts to steal from another person, while either using force or threatening to use force against them.

Burglary. The offence of burglary is defined by section 9 of the Theft Act 1968 and involves entering a building as a trespasser with intent to steal, inflict bodily harm or do unlawful damage to the building or anything in it (Theft Act, 1968).

Handling stolen goods. The offence of handling stolen goods is created by section 22 of the Theft Act 1968 and is defined as receiving or handling stolen goods, including the removal and disposal or the arranging thereof (Theft Act, 1968).

Going equipped for theft. Going equipped for theft is an offence defined by section 25 of the Theft Act 1968. Offences in this group are linked to accusations of burglary or theft that involve carrying tools that cause suspicion, including, for instance, crowbars or bolt cutters (Theft Act, 1968).

Fraud. Fraud is a crime which involves obtaining financial gain by using misleading and deceptive conduct. The offence is described in section 1 of the Fraud Act 2006. It is committed by either making false representation (section 2), by failing to disclose information (section 3) or by abuse of a position (section 4). The Fraud Act 2006 may also be applied to deal with transport offences like more serious or systematic fare evasion (Fraud Act, 2006).

Criminal Damage. Vandalism is defined as the destruction or damaging of property belonging to another person. These offences are covered by the Criminal Damage Act 1971 and can vary in seriousness, ranging from destruction by fire, which may even cause danger to life, to minor incidents of damage with rather minimal costs. Offences involving property destroyed or damaged by fire are typically charged with arson (Criminal Damage Act, 1971).

3.2.2 Offences against the person

Personal crimes are most commonly generalised as violent crimes that result in physical or mental harm to another person. Fatal offences, where physical harm to another person is so severe that it causes death, are typically classified as homicide, including murder, manslaughter, and infanticide.

Assault. In English and Welsh law, assault is an offence described as inflicting intentional or reckless harm towards another individual (Offences Against the Person Act, 1861). It can encompass both physical and psychological harm. The various degrees of assault (associated with levels of injury) are common assault, actual bodily harm (ABH) and grievous bodily harm (GBH). While common assault involves unlawful touching of another person without any, or only minor, injuries, ABH involves serious injury and GBH involves very serious injury including wounding.

Murder and manslaughter. Murder and manslaughter are crimes where one person unlawfully kills another. Both offences are described as homicide (Offences Against the Person Act, 1861). Murder is committed when a person unlawfully kills another with an intent to kill or to cause serious injury. Manslaughter typically does not require an intent to kill and can be committed in three different ways: either by killing another person under extreme provocation which is considered loss of control (i.e., diminished responsibility), by acts of negligence, or by causing a person's death during an extremely dangerous act.

Sexual offences. Sexual offences are violent crimes that involve sex or violations of social taboos, such as incest or exhibitionism. There are a number of offences considered as sexual offences under the Sexual Offences Act 2003, including non-consensual sex, such as rape or sexual assault, crimes against children, including child sexual abuse or the creation of indecent photographs of a child, and crimes that exploit others for a sexual purpose in person or via the internet (Sexual Offences Act, 2003).

3.2.3 Public order offences

Public order offences generally involve the use of violence and/or intimidation by individuals or groups. These offences include a wide range of acts, including breach of the peace, disorderly conduct, violent disorder, threatening behaviour, and intentional harassment (Public Order Act, 1986).

Possession of a weapon. England and Wales have a wide range of laws which restrict the use and possession of offensive weapons, such as guns and knives. Carrying an offensive weapon in public is an offence under section 1 of the Prevention of Crime Act 1953 (Prevention of Crime Act, 1953). Further, the Firearm Act 1968 includes more than 50 offences related to different types of weapons. Generally, it is a criminal offence to use a gun or knife to harm or threaten another person. Under section 5, possession of certain weapons (e.g., firearms) is classified as offensive regardless of the context in which they are carried or used (Firearm Act, 1968).

Harassment, alarm, or distress. Section 5 of the Public Order Act 1986 creates the offence of intentional harassment, alarm, or distress. These offences include threatening or insulting words or behaviour or the display of any visible representation which is likely to cause distress, or provoke immediate violence (Public Order Act, 1986).

Drug offences. The Misuse of Drugs Act 1971 is the main law regulating drug use in England and Wales. Its primary objective is the control of the use and distribution of harmful drugs. Drug use *per se* is not an offence under the Misuse of Drugs Act 1971; it is rather the possession of the drug that constitutes an offence. Furthermore, drug trafficking or manufacturing and supplying drugs are also covered by the act and constitute drug-related crimes (Misuse of Drugs Act, 1971).

3.3 Note on the Legal Definition of Crime

The legalistic approach to crime (e.g., Tappan, 1947) is not without controversies. While seemingly straightforward, this perspective does not address the complexities surrounding the concept of crime. The legal definition of crime is a relative definition; it is a social construct and as such varies across time and place and reflects social and political conditions.

Hence, for a more complete definition of crime it is important to also look at what constitutes right and wrong in societies and to address the factors that make lawmakers decide to criminalise certain behaviours. Critical criminologists have argued that it is particularly

important to ask questions about whose interests are being served by classifying certain behaviours as undesirable and illegal (e.g., Chambliss, 1975; Quinney, 1974; Taylor, Walton, & Young, 1973). It seems a consensus view that criminal laws are built on widespread societal agreement. However, defining crime as a violation of law does not seem to have an objective basis. It is difficult to identify any explicit rules that lawmakers follow in order to determine if a behaviour ought to be defined as a criminal act in the law. Hence, for criminologists it is important to also address those factors that affect the construction of criminal law.

In its early years, there was only little debate about the concept of crime within the discipline of criminology. One of the first criminologists to criticise the definition of crime as the violation of criminal law was Ross (1907) who observed that there were other behaviours with very similar attributes to crime which were not officially labelled as crimes in the criminal law. He claimed that the law had specifically left out many of the crimes committed by the economically powerful and argued that crime, defined by the state, was merely a product of politically creating a label for some forms of deviance. As such, it is likely to be infused with power and to reflect the interests of those who create the law.

Over time, new approaches to defining crime were introduced (see e.g., Hagan, 1987 for a review) and other perspectives in criminology have started to challenge the legalistic definition of crime. One of them is the conduct norm perspective (e.g., Sellin, 1938), which is closely linked to the conflict school of criminology. Similar to Ross (1907), this perspective asserts that the definition of crime is controlled by those who hold political power, and as such, it reflects the norms and values of the dominant social class. This perspective advocates a wider definition of crime and suggests that it also includes acts like economic and political domination, violations of human rights as reflected by racism, sexism or imperialism, and unequal opportunities for education, housing, and health care. Another perspective is the symbolic interactionist approach, which has its roots in defining crime in the works of Mead (1863-1931), Cooley (1864-1929) and Thomas (1863-1947). Similar to the conduct norm perspective, symbolic interactionists argue that powerful individuals use their influence to determine the boundaries of acceptable and unacceptable conduct (e.g., Siegel, 2000). However, unlike the conduct norm perspective, the symbolic interactionist approach does not suggest that this is a result of capitalist relations, but rather it conceptualises criminal laws as reflecting the current morality of society more generally.

What is important here is that critical criminologists have drawn attention to the complexities surrounding the concept of crime and how its visible and invisible dimensions are linked to societal power relations. Using measures of crime that are based on the legal definition of crime has important implications when studying micro-level theories of criminal behaviour. The variability in crime across individuals, and across time and place, is linked to social forces that shape the definition of crime, and thus an unknown fraction of the variability in crime is due to these forces. This is a factor that affects statistical crime rates as well as the specification of micro-level explanations of crime.

Furthermore, in context of this thesis, it is important to bear in mind that the legal definition of crime is a social and political construct, a relative measure of crime, which excludes certain types of behaviours that may appear similar to other criminal acts but are not included in the criminal law, such as environmental crimes (e.g., Hoefnagels, 1973). The legal definition of crime allows for the construction of less serious or non-criminal categories for certain forms of deviance (e.g., Sutherland, 1949) or for the exclusion of some harmful behaviour from criminal persecution, including violations of certain human rights (e.g., Cohen, 1993). Thus, using the legal definition and measurement of crime may lead to a stronger focus on street crime and offenders from the underclass segments of society.

Finally, it is important to consider that, when studying micro-level theories based on the legal definition and measurement of crime, it may be that what is observed is simply the manifestation of the social and political construction of crime. This would be true if lawmakers were more likely to criminalise the behaviour of certain populations, as these populations may have the same characteristics that criminologists posit as causes of crime. In other words, it may be that, instead of investigating the causes of crime, criminologists may rather assess the effects of those factors on the making of the criminal law. The legalistic approach to defining crime clearly has advantages in terms of clarity and precision, particularly for quantitative criminological research, but it is important to be aware of the complexities (e.g., the processes of criminalisation) surrounding the concept of crime, which is crucial for a more comprehensive understanding of crime and may have implications for the study of criminal behaviour.

4 Mental Disorders and Criminal Behaviour

The relationship between crime and mental disorders has been a subject of debate for centuries and the focus of research for many decades (e.g., Gunn, 1977; Penrose, 1939). The importance of this topic is undeniable, both in terms of society's aim to prevent crime and promote mental health, particularly given the scarcity of resources and the efforts required for meeting people's complex needs and mitigating adverse consequences (e.g., Harte, 2015; Jennings, Gover, & Piquero, 2011; Torrey, 2011). While most people with mental disorders are not criminal and the majority of crimes, violent and nonviolent, are committed by people without mental health problems (Van Dorn, Volavka, & Johnson, 2012), high-profile criminal cases attract a large amount of public attention, affect perceptions and contribute to the stigmatisation of individuals with mental health problems (e.g., Ahonen, 2019; Corrigan, 2000).

Historically and in the media, the link between mental disorders and crime, in particular violent crime, has attracted substantial interest, while empirical evidence of the association is rather new and has been largely inconclusive (see also Elbogen & Johnson 2009). The purpose of this thesis is to contribute to and expand the knowledge about the association between crime and mental disorders and to challenge some prevailing conceptions. The following overview is not an exhaustive review of the literature but provides a thorough insight into the current understanding of the association between mental disorders and criminal behaviour. However, before considering contemporary public and professional perceptions of the relationship between mental disorders and crime, it will be helpful to briefly set the topic in historical and cultural context.

4.1 Historical Perceptions

Associations between crime and mental disorders have been debated for thousands of years. In a comprehensive review, the medical historian Rosen (1968) synthesised societal perceptions of the association during different historical periods and found first references in ancient Greek and Roman literature. In the *Second Alcibiades*, for instance, Plato described a conversation in which Socrates claimed that the prevalence of mental disorders in Athens had to be relatively low because of the few incidents of violence in the city (Rosen, 1968, p. 100). Likewise, Aristotle believed that madness was often the cause of bizarre murders (Rosen 1968, p. 171) and Plutarch claimed that there was a "wide acceptance of the view that those who were mentally deranged were likely to throw stones or exhibit other kinds of aggressive behaviour when agitated" (Rosen, 1968, p. 101).

However, even in ancient times the public did not believe that all people with mental disorders were violent, they just assumed that there was a relatively high percentage among them. The Roman philosopher Philo of Alexandria, for instance, suggested that there were two distinct groups of people with mental disorders: A larger group consisting of those who were of the "easy-going gently style" and a smaller group that was made up of those individuals "whose madness was […] of the fierce and savage kind, which is dangerous both to the madmen themselves and those who approach them" (Rosen, 1968, p. 89).

Throughout the Middle Ages and Renaissance similar views persisted (Rosen 1968, p. 143) and only little changed in terms of public perceptions in Modern Times. In the mid-19th century, for instance, Gray (1857), a leader in forensic American psychiatry, wrote: "A disposition to violence is a common characteristic of mental disease. It is exhibited in every conceivable manner, from harsh words to suicide and the most cruel and brutal murders and is found in every form of insanity" (p. 119). Similarly, following the acquittal of M'Naghten, who shot the British Prime Minister's private secretary, the *Times* printed the following lines in which Campbell (1843) expressed his sentiments about the mental disorder defence: "Ye people of England! exult and be glad, For ye're now at the will of the merciless mad" (p. 5).

The belief that psychiatric disorders are related to violence and criminal behaviour seems deeply embedded in Western culture but is by no means unique to it. The anthropologist Murphy (1976) conducted a comprehensive review of cross-cultural responses to mental disorders among a variety of ethnic groups, including the northwestern Alaska Yupik people and the Yoruba of Nigeria, and observed many similarities between perceptions in those different and more traditional societies. She concluded that "there seems to be little that is distinctively cultural in the attitudes and actions directed towards the mentally ill […] If the behaviour indicates helplessness, help tends to be given […] If the behavior is violent or threatening, the response is to restrain or to subdue" (Murphy, 1976, p. 1025). However, just because the belief that mental disorders are related to offending behaviour has persisted since ancient times and is found in many different societies does not necessarily mean that the belief is true.

4.2 Contemporary Perceptions

In modern times, surveys focusing on public perceptions, attitudes, and opinions have shown that society still tends to perceive individuals with a history of mental health problems as being more likely to be violent and dangerous (see e.g., Angermeyer, & Dietrich, 2006 for a review; Corrigan, & Watson, 2002; Garcia, Johnson, Carlucci, & Grover, 2020; Link,

Phelan, Bresnahan, Stueve, & Pescosolido, 1999; Nee, & Witt, 2013; Pescosolido, Medina, Martin, & Long, 2013; Stuber, Rocha, Christian, & Link, 2014).

In a large-scale study on public perceptions across 16 countries from all six inhabited continents, Pescosolido, Medina, Martin and Long (2013) found that more than half of respondents believed that people with mental disorders were unpredictable and likely to be violent. In a recent survey conducted with adults from a UK sample of the general public, Nee and Witt (2013) found that perceptions of an individual's propensity to commit crime were negatively affected by that individual's history of mental health problems. Participants were asked how likely they thought a person was to commit a crime and results showed that participants in all mental disorder vignettes were significantly more likely to think that the individual would commit a crime compared to those in the control group. For depression, 73% of the sample said it could be possible to certain that the individual would engage in criminal behaviour in the future and for schizophrenia, 62% endorsed the statement (Nee & Witt, 2013). In a replication of that study with adults from the USA, Garcia, Johnson, Carlucci and Grover (2020) found very similar results and concluded that the public "tends to view individuals afflicted with mental illness as being more dangerous or criminal" (p. 404).

However, as in ancient times, the public nowadays does not believe that mental disorders are inevitably linked to violence or criminal behaviour. In a recent survey on attitudes to mental disorders based on approximately 1,700 people, representative of adults in England, 64% of respondents agreed with the statement that "[p]eople with mental illness are far less of danger than most people suppose" (TNS BMRB, 2015).

Public opinion about the dangerousness of people with mental disorders is profoundly influenced by news and entertainment media. The media is a powerful source of information and the portrayal of individuals with mental disorders in movies and television in general has an important influence on public perceptions of those individuals and their conditions (Pirkis, Blood, Francis, & McCallum, 2006). In fact, research has shown that a substantial part of the population obtains their information and knowledge about mental disorders primarily from the media (Orchowski, Spickard, & McNamara, 2006; Wollf, Pathare, Craig, & Leff, 1996).

The media is often cited as contributing to establishing and reinforcing negative attitudes towards individuals with mental health problems (see e.g., Wahl, 1992 for a review; Wahl 1995; Granello, Pauley, & Carmichael, 1999). Research has shown that people with mental disorders are often portrayed as ineffective in fulfilling societal roles and as being threats to community safety (Gabbard, 2007; Harris, 2020; Myrick, & Pavelko, 2017; Owen,

2012; Phelan, Link, Stueve, & Pescosolido, 2000; Stuart, 2006). In a content analysis of the portrayal of schizophrenia in contemporary movies, Owen (2012) found that a majority (83%) of characters with schizophrenia were portrayed as dangerous or violent and nearly one third (31%) of these violent individuals engaged in homicidal behaviour. The portrayal of people with mental disorders as "homicidal maniacs", a term coined by Hyler, Gabbard, and Schneider (1991), is one of the more prevalent stereotypes found in contemporary films. Notably, in an analysis of feature-length animated Disney films, Lawson and Fouts (2004) found reference to mental disorders in approximately 85% of all films, with 21% of main characters being described as having mental health problems. Most of the characters referred to as being mentally disordered were usually generic representations and served "as objects of derision, fear, or amusement" (Lawson, & Fouts, 2004, p. 313).

The distinction between entertainment and news media seems to be obvious, the former has the function to entertain, while the latter provides information. However, as such, news articles and broadcasts are likely to influence public perception under the guise of objectivity (Anderson, 2003). Research has shown that public opinion about the dangerousness of individuals with mental disorders is particularly influenced by news media coverage of violent and homicidal events (Stuart, 2006; Barry, McGinty, Vernick, & Webster, 2013).

Ahonen (2019), for instance, has examined how, after the 2018 Stoneman Douglas High School shooting in Florida, many media outlets immediately referred to the perpetrator as appearing to be mentally disordered. Similarly, after the 2011 Tucson shooting in Arizona, a public opinion poll revealed that 55% of the respondents considered a failure to identify mental health problems as the primary cause of the incident (Newport, 2011) and in a follow-up study one year later, Newport (2012) reported that half of all those surveyed said that an increase in government spending on mental health screening and treatment would be the most effective method to prevent violence. More recently, after a Germanwings plane crashed into the French Alps and investigations began to suspect that the co-pilot, who emerged to have had a history of depression, had deliberately downed the plane, questions were raised as to whether pilots with mental health problems should be allowed to fly, thereby implying that everyone who is depressed, or even suicidal, could also be murderous (e.g., Herman, 2015).

Public perceptions about the relationship between mental disorders and violence or offending behaviour more generally are more often than not based on information from the media rather than on empirical evidence (Ahonen, Loeber, & Brent, 2017). In that context,

Stuart (2006) has noted that fewer than 15% of newspaper articles dealing with mental disorders include contributions from mental health professionals and only 0.8% contain input from people with mental disorders. The interrelations between entertainment media, news media, and public perceptions contribute to the persistence of negative attitudes towards individuals with mental health problems and demonstrate the complexities surrounding the link between mental disorders and crime. Corrigan (2000) has argued that "[s]evere mental illness strikes with a two-edged sword" (p. 48), suggesting that people with mental disorders do not only struggle with the symptoms related to their conditions, but that they are also stigmatised as a result of misconceptions about mental disorders. Hence, the following section provides an introduction to more professional perceptions which will help to determine to what extent public beliefs are incongruent with empirical findings and contribute to a more complete understanding of the association between mental disorders and crime.

4.3 Professional Perceptions

In society, there are primarily two professional groups who do not believe that mental disorders and violence or criminal behaviour are associated at greater than chance level (see also Monahan, 1992). One of them are mental health charities and organisations that work alongside people with mental health problems and typically hold the view that a mere diagnosis of a psychiatric disorder does not make a person more likely to be violent, behave irresponsibly or show disregard for societal rules and laws.

These organisations often claim that people with mental disorders pose no more of a threat than do other members of the community. Instead they argue that "there is at most a small correlation between mental illness and violence" and that "media sensationalization of violence, and especially graphic coverage of isolated instances of mass gun violence that involve persons with mental health conditions, tend to rekindle deep-seated fears and stereotypes" (MHA, 2018). Likewise, the UK Mental Health Foundation (MHF, 2015) has stated that "[t]he situation is exacerbated by the media" and that "in fact they [people with mental health problems] are more at risk of being attacked or harming themselves than harming other people."

The other group, that suggests that public perceptions about the relationship between crime and mental disorders does not reflect reality, consists of a number of sociological, psychological, and criminological scholars, whose research did not provide convincing evidence of a link between mental disorders and criminal behaviour (e.g., Sosowsky, 1978; Steadman, Cocozza, & Melick, 1978; Monahan, & Steadman, 1983). During the 1980s, two

contrasting perspectives on the relationship between mental disorders and offending behaviour emerged, reflecting methodological and ideological differences. Alongside the psychiatric view, a sometimes arbitrary labelled "criminological approach" (Wessely & Taylor, 1991) developed, which held that crime and mental disorders are only weakly associated, if at all. A well-known study by Monahan and Steadman (1983) opened the door to this new perspective. Based on a comprehensive review of more than 200 studies on the association between crime and mental disorders the authors summarised their findings as follows:

> The conclusion to which our review is drawn is that the relation between […] crime and mental disorder can be accounted for largely by demographic and historical characteristics that the two groups share. When appropriate statistical controls are applied for factors such as age, gender, race, social class, and previous institutionalization, whatever relations between crime and mental disorder are reported, tend to disappear. (Monahan & Steadman, 1983, p. 152).

Thus, the "criminological approach" suggested that factors associated with offending in general were also indicators of the risk of offending among people with mental disorders and it was proposed that any observed link between mental disorders and criminal behaviour was more a product of mental health and criminal justice system responses than anything else (e.g., Wessely, & Taylor, 1991). In fact, Wessely and Taylor (1991) claimed that there were specific sociological explanations for the overrepresentation of individuals with mental health problems in studies of crime. One explanation, for instance, refers to the deinstitutionalisation movement which in combination with inadequate provision of community-based treatment is hypothesised to have led to the criminalisation of mental disorders and contributed to shifting a large number of people, who were originally treated in the mental health system, to the criminal justice system (e.g., Aderibigbe, 1997; see Lamb, & Weinberger, 1998 for a review; Teplin, 1983). Another explanation refers to the concept of the medicalisation or psychiatrisation of criminal behaviour, in particular among mental health patients, whereby a range of behaviours is hypothesised to have become defined legitimate for psychiatric or medical intervention and individuals who might have normally remained in the criminal justice system were now referred to mental health services (e.g., Coid, 1988; Monahan, 1973).

Overall, the stance of the "criminological approach" during the 1980s was that mental disorders play only little part in the aetiology of criminality in people with mental health problems (e.g., Monahan, & Steadman 1983; Wessely, & Taylor 1991). However, the

relationship between mental disorders and offending behaviour is an issue with considerable clinical and political importance and over the last four decades research on this association has continuously sparked renewed debate. Even though a growing body of criminological research suggested that mental disorders and offending behaviour were not associated at greater than chance level, numerous studies in the early 1990s led researchers, including Monahan (1992) who originally dismissed any link between mental disorders and criminal behaviour, to review their opinions (see also Wessely, Castle, Douglas, & Taylor, 1994). It was argued that the fact that first epidemiological studies did not provide any convincing evidence for the association was mainly due to methodological shortcomings.

Ever since, there has been a long-standing debate in research over the association between mental disorders and offending behaviour and the amount of contrasting findings generated over the past years highlights the complex nature of the link.

With regard to public perceptions about the dangerousness of people with mental disorders, Teplin, Abram, and McClelland (1994) stated that "[n]o study has yet determined […] whether this stereotype is true: We do not know whether mentally disordered offenders are more likely than nondisordered offenders to commit violent crimes" (p. 335). In line with the stance of the "criminological approach", contemporary researchers like Rueve and Welton (2008) have claimed that "[t]he overall impact of mental illness as a factor in the violence that occurs in society as a whole appears to be overemphasized, possibly intensifying the stigma already surrounding psychiatric disorders" (p. 46). Likewise, in a recent comprehensive review of the literature on the link between mental disorders and violence, Elbogen and Johnson (2009) concluded that "[b]ecause severe mental illness did not independently predict future violent behavior, these findings challenge perceptions that mental illness is a leading cause of violence in the general population" (p. 159).

While the public tends to assume a link between mental disorders and offending behaviour, mental health charities and organisations as well as many criminological researchers have shown that this perception may not entirely be true. However, contrasting perspectives and research approaches indicate a more complex picture about the relationship and taken together, have produced mixed results about the link. This has aptly been illustrated by a quote from Monahan and Steadman (1983) who in response to Gunn's (1977) claim that "[t]he main problem in discussing any relationship […] is that the two concepts are largely unrelated" (p. 317) said that the fact that "they are not *completely* unrelated, however, may be the source of even more difficulty" (Monahan & Steadman, 1983, p. 145).

Before reviewing the literature in more detail, it will be helpful to introduce an analytical framework which will provide guidance and assist in the systematic organisation and interpretation of the various studies' results.

4.4 Evidence for a Relationship

For examining the association between mental disorders and offending behaviour, there are three complementary approaches. These include studies estimating the prevalence of (1) criminal behaviour among people with mental disorders (i.e., clinical research), (2) mental disorders in individuals who have committed a crime (i.e., correctional research), and (3) offending behaviour in those with and without mental disorders, regardless of their involvement with mental health or criminal justice systems (i.e., community-based research). While the first two approaches seek to estimate the relationship between mental disorders and crime by studying institutionalised individuals, who are being treated either for mental disorders (e.g., in hospitals) or for criminal behaviour (e.g., in prisons), the third approach seeks to estimate the relationship by studying people unselected for treatment in the community. The structure of the literature review follows this analytical framework, focusing on research on the association between offending behaviour and schizophrenia (Section 4.4.1), mood disorders (Section 4.4.2), anxiety disorders (Section 4.4.3) and personality disorders (Section 4.4.4).

4.4.1 Offending and schizophrenia

It seems that the majority of published research on offending behaviour and mental disorders focuses on the association between schizophrenia and violence (see also Short, Lennox, Stevenson, Senior, & Shaw, 2012). Violence is the most commonly examined offence category in relation to psychotic symptoms and a lot of research is based on clinical samples. Almost four decades ago it was suggested that there was no increased risk for violence in individuals with mental disorders (see Section 4.3). However, since then several large population-based studies have found modest associations, in particular for the link between offending behaviour and schizophrenia. There is evidence indicating that people with schizophrenia have a higher than average risk of committing violent acts (see e.g., Fazel, Gulati, Linsell, Geddes, & Grann, 2009 for a review), that they account for a large portion of forensic inpatients (e.g., Hodgins, & Müller-Isberner, 2004; see Hodgins, & Müller-Isberner, 2014 for a review) and that the prevalence of schizophrenia is higher among people in contact with the criminal justice system (e.g., Bradley, 2009; Fazel & Danesh, 2002; Singleton, Meltzer, Gatward, Coid, & Deasy, 1998 for reviews).

Clinical setting. Many people diagnosed with schizophrenia are enrolled in community-based mental health programmes. However, people who experience more serious psychotic symptoms may be referred to psychiatric clinics for treatment. A lot of published research on the association between violence and schizophrenia is based on these clinical samples.

In a large-scale systematic review of studies on the prevalence of violence in mental health patients with schizophrenia, Fazel and colleagues (2009) found significantly elevated rates of violent behaviour among patients. Of the 18,423 patients in the included studies, 9.9% reported violence, compared to only 1.6% violent individuals in the general population controls (n = 1,714,904). However, prevalence rates of violence in inpatient studies have been shown to vary considerably depending on when the violence took place relative to the treatment or hospitalisation (Choe, Teplin, & Abram, 2008). For instance, Volavka and colleagues (1997) analysed data from the WHO Collaborative Study on the Determinants of Outcome of Severe Mental Disorders (Jablensky et al., 1992) and found that among the 1,017 patients with schizophrenia, 20.6% had a history of assaulting behaviour, with 7% of the assaults occurring before, 58% coinciding with and 35% following the onset of the psychotic symptoms.

More recent case linkage studies have shown that, despite varying prevalence rates, up to half of the offending by people with schizophrenia occurs before their first contact with mental health services (e.g., Munkner, Haastrup, Jorgensen, & Kramp, 2003; Wallace, Mullen, & Burgess, 2004). In one review, Choe, Teplin, and Abram (2008) found that the violence perpetration of inpatients with psychotic or major affective disorders is most prevalent during the period before their first treatment encounter. The prevalence ranged from 14.2% among voluntary inpatients in the months before hospitalisation (Tardiff, Marzuk, Leon, & Portera, 1997) to 50.4% among committed inpatients in the four months before hospitalisation (Swanson et al., 1998). Similarly, a review by Large and Nielssen (2011) showed that about one third of patients (35.4%) with first episode psychosis showed some form of violent behaviour before their first treatment and approximately one in six (16.6%) committed an act of more serious violence before their initial treatment.

Rates were found to be even higher among patients in high security psychiatric hospitals. Jones, Van den Bree, Ferriter and Taylor (2009) investigated 1,594 patients with schizophrenia who were admitted to a high security psychiatric hospital and found that 54% had offended prior to their first service contact. In another comprehensive study with a

matched community control group, Wallace, Mullen, and Burgess (2004) found that 8.2% of the 2,861 individuals with first admission for schizophrenia had a conviction for violent offences compared with 1.8% of individuals in the control group. The authors concluded that those with schizophrenia were nearly five times (OR = 4.8) more likely to be convicted for a violence offence than those without schizophrenia. However, Wallace, Mullen, and Burgess (2004) noted as well that offending in those with schizophrenia was not likely to be influenced solely by the presence of active symptoms of schizophrenia, but was more likely to "reflect a complex interaction between the deficits in social, psychological, and brain function that precede, accompany, and follow the overt disturbances of mental state" (p. 726).

In line with that observation, Large and Nielssen (2011) stated that factors related with violence in first episode psychosis patients were very similar to the factors that are associated with violence in the wider community, including "young age, a lack of education, prior offending and substance use" (p. 214), leading them to conclude that violence before the initial treatment or hospitalisation may be due to a combination of active-phase symptoms of schizophrenia and the presence of other known risk factors for violent behaviour. Further it has been suggested that more serious violence is significantly associated with the length of time that patients experience psychotic symptoms without receiving appropriate treatment (Large, & Nielssen, 2008; Nielssen, Westmore, Large, & Hayes, 2007).

Although rates of violence and offending behaviour among individuals with schizophrenia have generally been shown to be higher in the pretreatment phase, there is also a high number of incidents occurring during the treatment phase or hospitalisation (e.g., Volavka et al., 1997). A recent review of studies on the prevalence of aggression[5] during first episode psychosis revealed that approximately 31% of patients engaged in aggressive behaviour of some form and 16% in more serious aggression following their initial service contact (Winsper et al., 2013). The percentage of aggressive individuals with first episode psychosis varied greatly in the included studies, from 17% (Milton et al., 2001) to 49% (Steinert, Wiebe, & Gebhardt, 1999) for any aggressive behaviour and from 5% (Milton et al., 2001) to 27% (Harris et al., 2010) for serious aggression.

Likewise, a German study on aggressive behaviour among first admission hospital patients with schizophrenia reported that 22% of the patients showed aggression during their admission (Steinert, Wiebe, & Gebhardt, 1999) and similarly, a study conducted in a Spanish

[5] Includes physical aggression, physical violence, assault against another person and violent crime (Winsper, Ganapathy, Marwaha, Large, Birchwood, Singh 2013).

general hospital found that 25.4% of inpatients with schizophrenia or schizoaffective disorder were physically violent during their hospitalisation (Arango, Calcedo Barba, González-Salvador, & Calcedo Ordóñez, 1999). Comparable violence rates were found in a recent meta-analytical review of studies based on samples with mixed diagnosis (20.5% with a diagnosis of schizophrenia). Iozzino and colleagues (2015) found that 17% of patients in psychiatric wards reported at least one act of violence during their treatment phase. Notably, their subgroup analysis revealed that the proportion of patients with a diagnosis of schizophrenia was not independently associated with an increased proportion of violent patients and the results of their logistic regression showed that the best predictor for violence was insight into the necessity of treatment, while a history of violence demonstrated the highest sensitivity.

While several studies have focused on the risk of violence in individuals diagnosed with schizophrenia before and during hospitalisation, fewer studies have examined the period after discharge (e.g., Link, Andrews, & Cullen, 1992; Steadman et al., 1998). In one review of studies, Choe, Teplin and Abram (2008) found that rates of violence after discharge varied by type of sample and time frame. The prevalence of violence ranged from 3.7% among former voluntary inpatients within the two weeks immediately after discharge (Tardiff, Marzuk, Leon, & Portera, 1997) to 27.5% among committed inpatients during the year after discharge, of whom over two-fifths had been involuntarily committed (Steadman et al., 1998).

The latter prevalence rates come from a study based on a sample from the MacArthur Violence Risk Assessment Study which is, to date, one of the most comprehensive studies published on violence risk after discharge (see also Link, Andrews, & Cullen 1992). Steadman and colleagues (1998) showed that the prevalence of violence after discharge decreased with time and found that comorbid substance use problems accounted for much of the violence in discharged psychiatric patients[6]. In fact, they reported that the prevalence of violence among former inpatients without substance use disorder was statistically indistinguishable from the prevalence of violence among others in their neighbourhood without substance use disorder. However, Steadman and colleagues (1998) did not provide information for schizophrenia alone.

In a case control study from Switzerland, Modestin and Ammann (1996) explored the lifetime prevalence of criminality among 282 former male patients with schizophrenia and

[6] Patients had a diagnosis of either schizophrenia, schizophreniform disorder, schizoaffective disorder, depression, dysthymia, mania or other psychotic disorders (including delusional disorder, atypical psychosis and brief reactive psychosis).

compared them to matched individuals from the general population. The authors did not find any significant differences in overall criminal records between the two groups (34% versus 36%), but observed a significant difference for violent offences: 5% of former patients had a conviction for violent offences compared with only 1% of individuals in the control group. Individuals with schizophrenia were five times (OR = 5.2) more likely to have been convicted of a violent crime than never-treated individuals. With regard to the temporal order, Modestin and Ammann (1996) reported that 59% of former patients with a criminal record were convicted before their first hospitalisation, while 41% were convicted afterwards.

A study conducted by Hodgins, Hiscoke, and Freese (2003) used data from the Comparative Study of the Prevention of Crime and Violence by Mentally Ill Persons (Hodgins & Müller-Isberner, 2004) and examined the prevalence rates of aggressive behaviour in 128 males with schizophrenia or schizoaffective disorder discharged from psychiatric hospitals in Canada, Finland, Germany and Sweden for a period of one year. The authors reported that 10.2% of the males with schizophrenia were violent during the first 12 months after discharge. Notably, almost all of those who showed aggressive behaviour after discharge (79%) had at least one previous hospital admission, more than two-thirds (69%) had a criminal record for violence before hospitalisation and 62% had a comorbid diagnosis of alcohol abuse or dependence.

Likewise, in another comprehensive study, Soyka, Graz, Bottlender, Dirschedl, and Schoech (2007) assessed the prevalence of criminal offences in a sample of former inpatients with a diagnosis of schizophrenia who were treated in a psychiatric ward in Germany. The authors reported that of the 1,662 patients, 10.2% were convicted in the 7-12 year following discharge, whereby male patients (17.1%) outnumbered female patients (5.3%) by more than three to one. They found that gender and lack of insight at discharge were significant predictors of future violence.

In a large-scale case linkage study, Fazel, Långström, Hjern, Grann, and Lichtenstein (2009) sought to determine the risk of violent behaviour among former inpatients diagnosed with schizophrenia using the Swedish National Inpatient Register. The authors compared the risk of violence in 8,003 former patients with schizophrenia with the risk among 80,025 general populations controls and found that 13.2% of patients committed at least one violent offence compared with only 5.3% of the control group, indicating that former patients with schizophrenia had twice the odds (OR = 2) to commit a violent offence. However, subgroup analyses revealed that the risk of violence was mostly confined to former patients with

comorbid substance use disorder, of whom 27.6% committed an offence (OR = 4.4), while the risk in patients without comorbid substance use disorder, of whom 8.5% committed at least one violent offence, was only slightly elevated (OR = 1.2).

Finally, in a nationwide Danish study, Pedersen, Olrik Wallenstein Jensen, Johnsen, Nordentoft, and Mainz (2013) followed up 10,757 patients with schizophrenia for one year after discharge. During that period, 20.2% of former patients with schizophrenia were charged with a criminal offence. Violent crime accounted for 58.9% of all criminal offences. Notably, the authors reported that they may have underestimated minor or nonviolent offences in their study, as it has been shown that patients with mental disorders are less likely to be charged with a crime, but instead are more likely to be admitted to a psychiatric hospital (see also Phillips & Verano, 2008).

Overall, however, studying violence or criminal behaviour among inpatients only may exaggerate the prevalence among patients with schizophrenia in general, because a majority of individuals receives treatment as outpatients. In a recent study combining in- and outpatients, Ose, Lilleeng, Pettersen, Ruud, and van Weeghel (2017) conducted a national census of patients treated within specialist mental health services in Norway, which included 65% of all inpatients (n = 2,358) and 60% (n = 23,124) of all outpatients. It was found that that among inpatients, the prevalence of violence was 32%, compared with only 8% among outpatients. This observation is line with findings of Choe and colleagues' (2008) systematic review, which found the lowest prevalence of violence among mental health patients, on average, in surveys of outpatients in treatment. Rates ranged from 2.3% for violent crime in the past three years (Brekke et al., 2001) to 13.0% self-reported violence among "the most severely disturbed patients" (Bartels et al., 1997).

In summary, the lowest rates of violence and criminal behaviour were found in surveys of outpatients in treatment (approximately 8%), followed by slightly higher average rates for discharged hospital patients (approximately 13%). The highest rates were found among inpatients during hospitalisation (approximately 31%) and before hospitalisation or first treatment contact (approximately 36%), when violence or other forms of deviant behaviour may have led to the admission.

Correctional setting. Overall, a large number of studies has examined the prevalence of mental disorders among people in contact with the criminal justice system. Since a pioneering study of admissions to Sing Sing prison in New York in 1918 highlighted the growing number of people with mental health problems in custody (Glueck, 1918), a large

body of research has demonstrated high rates of psychiatric morbidity within the criminal justice system. While research on schizophrenia is less common in prison studies, existing evidence suggests that individuals with schizophrenia are overrepresented in the criminal justice system (e.g., Andersen, 2004; Fazel & Seewald, 2012 for reviews).

The prevalence of schizophrenia in prison populations has been found to be mostly constant between 2% (Bland et al., 1990, 1998; Brinded, Simpson, Laidlaw, Fairley and Malcolm, 2001; Herrman, McGorry, Mills, & Singh, 1991; Teplin 1990a; Teplin, Abram, & McClealland, 1996) and 5% (Birmingham, Mason, & Grubin, 1996; Corrado, Cohen, Hart, & Roesch, 2000; Schanda et al., 2004), with a few studies reporting higher prevalence rates between around 12% and 16% (Bebbington et al., 2017) and overall slightly higher average rates in remanded individuals compared to sentenced individuals (e.g., Parsons, Walker, & Grubin, 2001; Singleton, Meltzer, Gatward, Coid, & Deasy, 1998).

A comprehensive review of studies on the prevalence of serious mental disorders in prisoners, which included 74 publications and about 30,635 prisoners (87.5% male) found that prisoners were significantly more likely to have a psychotic disorder (i.e., schizophrenia, schizophreniform disorders, and manic episodes) compared to the general population. It was estimated that overall, 3.7% of prisoners had an ongoing psychotic disorder compared with less than 1% in the general population (Fazel & Seewald, 2012).

Substantially higher prevalence rates were found in a more recent evaluation study of the needs for psychiatric treatment in prisoners in the UK. In that study, Bebbington and colleagues (2017) interviewed a representative sample of 368 prisoners (53.5% male) and found, an overall relatively high prevalence of psychosis. In total, 12.2% of prisoners met criteria for psychosis, which they stated is over 20 times the rate estimated for the general population (Qassem et al., 2015) and much higher than the prevalence found in previous studies (e.g., Fazel & Seewald, 2012). The authors suggested that these variations may be due to the type of sample and time frame they used. While Bebbington and colleagues (2017) examined the year before imprisonment, Fazel and Seewald (2012) examined only a period of six months before imprisonment.

Furthermore, Bebbington and colleagues (2017) found that the prevalence of psychosis in remand prisoners (16.1%) was nearly twice the rate in sentenced prisoners (8.8%). A similar pattern was found in a large-scale national survey among prisoners in England and Wales conducted by Singleton and colleagues (1998). The authors reported a relatively high prevalence of functional psychosis, including schizophrenia, among prisoners,

with remand prisoners (10%) having higher rates compared to sentenced prisoners (7%). Interestingly, Bebbington and colleagues (2017) found that participants had very high rates of pre-imprisonment contact with mental health services. More than 25.3% had previously been in touch with mental health services compared with 2.7% in the general population and around 7.4% had been admitted to a psychiatric hospital before, compared with only 0.3% in the general population.

Although prevalence rates of schizophrenia among prisoners have been shown to exceed those of the general population and violent behaviour by patients with schizophrenia before, during and after hospitalisation appears much higher than would be expected by chance, it is important to also examine the association in unselected samples (i.e., non-hospitalised and non-incarcerated individuals) of people in the community for a more complete understanding.

Community Setting. Before 1990, empirical evidence of the relationship between crime and mental disorders derived largely from clinical or correctional surveys that examined offending behaviour among psychiatric patients or mental health problems among incarcerated offenders. The first large-scale community-based study, and to date one of the most important epidemiological studies, was published in 1990 and reported on the prevalence of violent behaviour in individuals with and without diagnosable psychiatric disorders in a randomly selected community sample. In this pioneering study, Swanson, Holzer, Ganju, and Jono (1990) examined a representative sample of 10,059 individuals from the Epidemiologic Catchment Area study (Eaton & Kessler, 1985) and found that 8.4% of those with diagnosable schizophrenia reported violent behaviour compared with 2.1% of those without mental health problems. The authors found that people with diagnosable schizophrenia had four times the odds (OR = 4) of those without mental health problems to report violent incidents. Notably, this increase in risk of violence among people with schizophrenia remained statistically significant even after controlling for demographic and clinical factors (see also Monahan, 1992; Swanson, & Holzer, 1991).

In another influential community-based study, Link, Andrews, and Cullen (1992) examined rates of arrest and violence in a sample of 365 individuals from New York City who had never been in contact with mental health services and compared them with samples of former psychiatric patients from the same area. They found that the patient groups were almost always more violent than the never-treated community controls: while 12.3% of individuals with diagnosable schizophrenia reported violent behaviour during the past year,

only 5.2% of the never-treated community controls reported violent behaviour. The authors noted that the association between mental health patient status and violent behaviour was "remarkably resistant" (Link, Andrews, & Cullen, 1992, p. 286). Even after controlling for an extraordinary number of demographic and individual-level factors the significant difference between patients and never-treated individuals remained. Most notably, however, the authors observed that when controlling for current psychotic symptoms, the differences in rates of violent behaviour between patients and never-treated community controls rendered non-significant. This finding indicates that almost all differences in violence rates between the two groups could be accounted for by the level of active psychotic symptoms. Link, Andrews, and Cullen (1992) also found that among those who were never formally treated for mental disorders, experiencing psychotic symptoms was also associated with violent behaviour.

In a community-based epidemiological study with 2,678 young adults from Israel, Stueve and Link (1997) found that of the 29 individuals with a diagnosable psychotic disorder[7], 28.9% reported violent behaviour during the past five years compared with only 8.1% of individuals without psychotic disorders. Among males with diagnosable psychotic disorders, the odds ratio of violent behaviour was 3.3 for fighting and 6.6 for weapon use after controlling for substance use, antisocial personality disorder and other relevant sociodemographic factors.

In an influential Swedish birth cohort study of 406 males, Hodgins (1992, 1993) found that 14.6% of males with major mental disorders[8] had a lifetime criminal record for violent offences compared to only 5.7% of never-treated males. Those with a major mental disorder alone (i.e., without comorbid substance use disorder) had 1.7 times the odds of those without mental health problems to have been convicted for violent crime. Unfortunately, the authors did not provide separate information for schizophrenia only. In a more recent cohort study from Sweden, Fazel, Wolf, Palm, and Lichtenstein (2014) investigated a sample of 24,297 individuals with schizophrenia and compared them to 458,950 matched people from the general population. The authors estimated that over the study period of 38 years the adjusted odds ratio of a violence offence for individuals with schizophrenia compared with the general population controls was 6.6 in males and 14.9 in females.

[7] Psychotic disorders include diagnoses of schizophrenia, schizoaffective or unspecified functional psychosis and major depression with psychosis.

[8] Major mental disorders include diagnoses of schizophrenia and major affective disorders.

In a large-scale Danish birth cohort study with 165,602 males, Hodgins, Mednick, Brennan, Schulsinger, and Engberg (1996) found that 5.7% of males with a major mental disorder had a lifetime criminal record for violent crime compared to only 1.7% of never-treated males. Males with a diagnosis of a major mental disorder had 3.5 times the odds of those without mental health problems to have a conviction for violent crime. In a reanalysis of this sample, Brennan, Mednick, and Hodgins (2000) reported that of those 1,143 males with diagnosable schizophrenia, 11.3% were arrested for violent offences, indicating that they had nearly five times (OR = 4.6) the odds to be arrested for such an offence compared with never-treated individuals, of whom 2.7% reported arrests for violent offences. Among the 680 females with diagnosable schizophrenia, only 2.8% had a conviction for violent offences. However, compared to arrest rates among never-treated females they had 23.2 times the odds to be arrested for violence. The authors stated that the association between violent offending and schizophrenia was relatively robust and remained significant even after controlling for other factors. However, the odds ratios for violence arrests dropped from 4.6 to 1.9 for males with schizophrenia and from 23.3 to 7.1 for females with schizophrenia after controlling for confounding effects.

In a large-scale prospective longitudinal study of an unselected birth cohort of 12,058 individuals from Finland, Tiihonen and colleagues (1997) found that of those 51 males with diagnosable schizophrenia, 19.6% reported at least one registered crime. Notably, 70% of all registered crimes were violent offences. While the odds ratio for any criminal offence was 3.1 among those with schizophrenia, the corresponding odds ratio for violent offences was 7.0. The authors suggested that schizophrenia may be associated with a modest increase in risk for violent offences, but otherwise stated that the risk for other offence types was relatively low.

In a number of community-based studies from the UK, similar results were found. Wessely (1998), for instance, conducted a longitudinal study of 538 individuals diagnosed with schizophrenia and compared their conviction rates to the same number of matched controls. For males, he did not find any significant differences in overall conviction rates between those with and without diagnosable schizophrenia, but he observed a significant increase in violent offending in those with schizophrenia, with this group having twice the odds (OR = 2.1) of those without diagnosable schizophrenia to commit a violent offence. Notably, among females, prevalence rates for offending among those with diagnosable schizophrenia were increased across all offence categories with an odds ratio of 3.3 for overall offending and odds ratio of 3.1 for serious violent offending.

More recently, Coid and colleagues (2006a, 2006b) examined the prevalence of self-reported violence over a five-year period and its association to psychiatric disorders in a representative sample of adults in Britain. The authors interviewed a total of 8.397 individuals (49.8% males), of whom 12% reported violent behaviour in the last five years. Of the 982 violent individuals, 66% had a diagnosable psychiatric disorder compared to 37% non-violent controls. Individuals with psychosis had 3.2 times the odds of those without diagnosable psychosis to report violent behaviour in the last five years.

In an Australian case-linkage study with 4,156 individuals (92.3% males), Wallace and colleagues (1998) found a robust association between convictions for offences involving interpersonal violence and prior treatment for schizophrenia. Over a period of three years, 2,153 individuals were convicted for such offences, of these 3.3% had a diagnosis of schizophrenia. Among males who were convicted of homicide, 7.2% had been treated for schizophrenia. Individuals with schizophrenia were reported to have about four times the odds (OR = 4.4) to receive a conviction for serious violence and ten times the odds (OR = 10.1) to commit homicide compared with the general population.

In a birth cohort study from New Zealand, Arseneault and colleagues (2000, 2003) found that of the 961 adults interviewed, 39 had diagnosable schizophrenia and out of those, 33.3% reported violent behaviour in the preceding 12 months compared to only 3.8% violent incidents in the control group. The authors estimated that individuals with schizophrenia had 2.5 times the odds of those without diagnosable psychiatric disorders to report a violence conviction. They stated that violence committed by individuals with schizophrenia was best explained by either a history of conduct disorder or an overwhelming perception of threat. A similar observation was made in the previously mentioned study by Link and Stueve (1994), who found a strong relationship between serious violent behaviour and delusional beliefs that signal threats or compromised control, also known as threat/control override (TCO). It is suggested that an increased perception of personal threat (typically based on delusions) in combination with the perception of loss of control over one's thoughts precipitates aggressive behaviour (see also the principle of rationality-within-irrationality; Link, & Stueve, 1994).

Although some other studies have supported the notion that violence in individuals with schizophrenia could be explained by symptoms of TCO (e.g., Hodgins, Hiscoke, & Freese, 2003; Swanson, Borum, Swartz, & Monahan, 1996), others did not find any convincing evidence (e.g., Appelbaum, Robbins, & Monahan, 2000; Dean et al., 2007; Stompe, Ortwein-Swoboda, & Schanda, 2004). Coid and colleagues (2013), on the other side,

found a strong relationship between serious violence and delusional beliefs of threat, but no significant associations with control-override.

In another large-scale longitudinal study, Elbogen and Johnson (2009) examined 34,653 individuals from a representative sample in the USA. The authors found that, overall, 136 individuals had diagnosable schizophrenia with 5.2% of them reporting violent behaviour compared with 2.9% of non-schizophrenic individuals. The authors concluded that violence was neither predicted by schizophrenia alone nor by schizophrenia with comorbid substance use disorder. Using data from the National Epidemiologic Survey on Alcohol and Related Conditions (Grant et al., 2003, 2004), Van Dorn, Volavka and Johnson (2012), examined 32,653 individuals from a nationally representative household survey in the US. The authors found that among those with no mental or substance use disorders the prevalence of violence was 0.8% in contrast to 5.7% among individuals with a diagnosis of schizophrenia. Those with schizophrenia had the highest rate of violence compared with, for instance, individuals with affective disorders. They concluded that a past year schizophrenia diagnosis was significantly associated with violent behaviour (OR = 2.5).

Finally, in a systematic review and metal-analysis, which included 20 studies, 18,423 individuals with schizophrenia and 1,714,904 general population controls, Fazel, Gulati, Linsell, Geddes and Grann (2009) estimated that the pooled odds ratio of violence in individuals with schizophrenia compared with general population controls was 4.0 in males and 7.9 in females. Particularly comorbid substance use disorder was found to have a large impact in the risk of violent offending.

Overall, it may be said that in all community-based studies providing relevant information, the risk of violent or offending behaviour was higher among individuals with schizophrenia compared to those without diagnosable schizophrenia (but see Elbogen, & Johnson, 2009). Throughout almost all studies, a diagnosis of schizophrenia was found to be associated with a modest increase in risk of violent behaviour, but otherwise with a relatively low risk for other types of offences. The reported odds ratios were mostly constant between two and five, with one study reporting a 7-fold increased odds of violence among individuals with schizophrenia living in the community.

Conclusion. In conclusion, one can say that despite methodological differences with regard to sample population (i.e., psychiatric patients, incarcerated offenders, community residents), study design (i.e., cross-sectional, longitudinal) and assessment of offending behaviour (i.e., self-reports, official records), the reviewed studies seem to indicate that there

is a modest association between schizophrenia and violent behaviour. This finding is further strengthened by the fact that studies were conducted in various countries of the Western world with different criminal justice and mental health systems. However, it is important to note that attributable risk estimates generally suggest that the proportion of violent crimes committed by people with schizophrenia is rather small (e.g., Swanson, Holzer, Ganju, & Jono, 1990) and appears to be limited to particular symptom constellations (e.g., Coid et al. 2013; Hodgins, Hiscoke, & Freese, 2003; Link, Andrews, & Cullen, 1992).

4.4.2 Offending and mood disorders

To date, a number of studies has investigated the link between schizophrenia and violent behaviour, but studies on the association between affective disorders and offending are comparatively rare. The majority of published research on affective disorders and criminality is based on prison samples and most studies investigate overall mood disorders and do not explore the specific subtypes of affective disorders i.e., bipolar disorder, mania, and depression. Overall, there is evidence indicating that people with major affective disorders have a slightly higher than average risk of offending (e.g., Corrigan, & Watson, 2005; Fazel et al., 2015; Modestin, Hug, & Ammann, 1997) and that the prevalence of mood disorders is higher among people in contact with the criminal justice system (see e.g., Fazel & Danesh, 2002; Fazel & Seewald, 2012 for reviews). However, the nature of this association is still unclear. There is considerable debate as to whether the link is robust and whether any associations are actually due to symptoms of affective disorders or more a result of social and environmental factors.

Clinical setting. Depression is a relatively common and serious mental disorder, yet one of the most treatable psychological conditions. The majority of individuals with depression is treated on an outpatient basis, but in cases of severe symptoms individuals may be referred to inpatient treatment. However, most hospital stays for depression are rather brief and typically voluntary. A small number of studies has examined offending behaviour in patients with affective disorders and overall findings indicate a rather weak relationship (e.g., Graz, Etschel, Schoech, & Soyka, 2009; Hodgins, Lapalme, & Toupin, 1999; Modestin, Hug, & Ammann, 1997; Modestin, & Wuermle, 2005; Monahan, 1997).

In a comprehensive study from Switzerland, Modestin, Hug, and Ammann (1997) investigated the pretreatment prevalence of criminal behaviour in a sample of 261 male patients with major affective disorders (31% bipolar, 43% major and 26% minor or intermitted depressive disorder) and compared rates with those of matched individuals drawn

from the general population. The authors found that of the 261 patients with affective disorders, 42% had a criminal record in contrast to 31% individuals in the control group (see also Modestin, & Wuermle, 2005). Those with affective disorders had four times (OR = 4.1) the odds of individuals without diagnosable mental disorders to have a criminal conviction. Additionally, the authors reported that patients with affective disorders had spent more time in prison (30%) compared to the control group (15%). They estimated that those with affective disorders had twice the odds (OR = 2.4) of those in the control group to have been in prison before. Their subgroup analysis revealed a higher criminality rate among bipolar patients and patients with minor or intermittent depression, but no significantly increased rate among patients with major depression. Patients with bipolar disorder and minor or intermittent depression had twice the odds of the control group to have a criminal record (OR = 2.1 and OR = 2.2, respectively). Notably, the authors observed that criminal patients with minor or intermittent depression were more likely than other patients to also have an additional diagnosis of personality disorder. In addition, the authors suggested that the increased criminality rate in bipolar patients may be connected with their manic episodes. However, in a large-scale population-based study on the association between bipolar disorder and violent crime, Fazel, Lichtenstein, Grann, Goodwin, and Långström (2010) did not find any evidence of manic episodes as being specifically associated with an increased risk of violence compared with depressive episodes in bipolar disorder (OR = 1.2 ns).

In a slightly smaller study Hodgins, Lapalme, and Toupin (1999) investigated the criminal activities of 30 male patients with a primary diagnosis of major affective disorders (60% bipolar, 40% major depression). The authors found that 63% of patients had a criminal record and 27% were previously incarcerated. With regard to the type of criminal record, they did not find any significant differences: 47% of patients had a conviction for non-violent crimes, 40% for violent crimes and 13% for homicides. In contrast, Higgins (1990) found that major affective disorders were associated with violent rather than non-violent crimes. In line with that, Monahan (1997), who studied a large sample of patients after discharge for the MacArthur Risk Assessment study, reported that, compared to patients with other major mental disorders, those with affective disorders had the highest rates of violent behaviour during the follow-up period. However, in a twin study based on a group of 280 patients diagnosed with major mental disorders, Coid, Lewis, and Reveley's (1993) findings pointed into a different direction. The authors found that of those patients with affective disorders only 19.4% had a criminal record compared with 48.6% of patients with schizophrenia, for instance.

In a post-treatment study, Hodgins, Lapalme, and Toupin (1999) followed up 30 patients with major affective disorders (60% bipolar, 40% major depression) from hospitals in Canada and found that during the 24-months follow-up period, 33% of former patients were convicted of a criminal offence. Their subgroup analysis did not reveal any significant differences between patients diagnosed with major depression and those diagnosed with bipolar disorder in terms of criminality (33% versus 33%). However, they did find that those with bipolar disorder showed a tendency to have committed more non-violent offences and that they were more likely to have previously been incarcerated (83% versus 25%). Interestingly, the authors matched patients with major affective disorders and those with schizophrenia at discharge and found that those with major affective disorders were more likely to hold a job and had spent, overall, less time in hospital. In the 24-months follow-up period, twice as many participants with affective disorders (33%) were convicted of a crime than those with schizophrenia (15%). With regard to convictions for violent crime, 30% of former patients with affective disorders were convicted of such crimes in comparison to only 10% of those with schizophrenia. Lastly, the authors observed that that those with affective disorders were significantly more likely to have a lifetime diagnosis of alcohol abuse (50%) compared with those diagnosed with schizophrenia (27%).

In a more recent study, Graz Etschel, Schoech, and Soyka (2009) investigated the posttreatment criminal behaviour of a group of 1,561 former patients with affective disorders (5.7% manic, 48,4% bipolar, 45.0% major depressive disorder and 0.9% other or unspecified affective disorders). Overall, the authors found that 4.2% of former patients were convicted during the 7- to 12-year period after discharge. Of the 702 patients with a diagnosis of major depression, 4.7% were convicted during the follow-up period and of the 756 patients with bipolar disorder, 2.3% committed a crime during the follow-up period. Violent offences were comparatively rare with 1.4% of depressed patients and 0.7% of bipolar patients committing violent crimes. The authors concluded that, overall, findings indicated some evidence for a moderate association between affective disorders and criminal behaviour but noted that the highest prevalence was found among patients with mania (15.7% convicted after discharge).

In summary, clinical studies seem to indicate that there might be a slight increase in risk of offending behaviour in patients with affective disorders, in particular among those with manic or bipolar disorders. Compared to individuals without mental health problems and those diagnosed with other mental disorders like, for example, schizophrenia, rates of criminal behaviour among patients with affective disorders were slightly elevated during both pre- and posttreatment phases. However, findings are inconclusive and it remains unclear whether

small prevalence rates are due to the fact that there is only a small number of hospitalised individuals with affective disorders or whether those rates are an indication of relatively low rates of criminal behaviour in individuals with affective disorders in general.

Correctional setting. The majority of published research on the association between mood disorders and offending behaviour is based on offender populations. Overall, affective disorders are found with higher prevalence in prison studies compared with the general population (e.g., Baranyi et al., 2019; Fazel & Danesh, 2002; Fazel, Hayes, Bartellas, Clerici, & Trestman, 2016; Fazel & Seewald, 2012; Fazel & Yu, 2011 for reviews). However, prevalence rates in prison studies vary considerably depending on the subtypes of affective disorders included. Overall, studies focusing on depression (e.g., Bebbington et al., 2017; Binswanger et al., 2010; Brinded, Simpson, Laidlaw, Fairley, & Malcolm, 2001; Corrado, Cohen, Hart, & Roesch, 2000; Côté & Hodgins, 1992; Dunsieth et al., 2004; Hodgins, & Côté, 1990; Teplin, 1990a, 1990b; Teplin, Abram, McClelland, 1996) found rates of depressive symptoms ranging from 1% among female prisoners (Hurley, & Dunne, 1991) to 57% among prisoners on remand (Bebbington et al., 2017).

In a comprehensive review on the prevalence of serious mental disorders in prisoners, which included 54 publications and about 20,049 prisoners (79.9% male, 20.1% female), Fazel and Seewald (2012) estimated that the prevalence of major depression was around 10.2% in male and 14.1% in female prisoners. The authors did not find any significant differences in rates of depression between remand and sentenced prisoners (12.3% versus 10.5%). In view of the fact that evidence from this review was mainly based on studies from high income countries, Baranyi and colleagues (2019) conducted a systematic review of the prevalence of severe mental disorders among incarcerated individuals from low- and middle-income countries. The review included 23 publications and about 14,527 prisoners and the authors estimated a pooled prevalence of 16.0% for major depression among prisoners from low- and middle-income countries.

Remarkably higher prevalence rates were found in a more recent evaluation study of the needs for psychiatric treatment in prisoners in the UK. Bebbington and colleagues (2017) interviewed a representative sample of 368 prisoners (53.5% male, 46.5% female) and found extremely high prevalence rates of depression. The authors estimated that, overall, approximately 53.8% of prisoners met criteria for depressive disorder with 49.2% of male and 58.0% of female prisoners having depressive states (i.e., depressive episode plus mixed anxiety/depressive disorders) and 19.9% of male and 23.7% of female prisoners being

affected by more severe forms of depression. With regard to prisoner status, the authors found that the prevalence of depressive states was slightly higher in remand than in sentenced prisoners (57.0% versus 50.0%).

Studies that made direct comparisons between prison and community samples have found, overall, comparable, or little higher prevalence rates of depression in prison samples. In an early study, Teplin (1990a) compared the lifetime prevalence of major depression among a random sample of 728 male offenders and used data from the Epidemiologic Catchment Area study for comparison. Prevalence rates for major depression were reported to be 5.8% among male prisoners and 3.2% among males in the Epidemiologic Catchment Area study. In a similar study among 1,272 female prisoners in the same facility, Teplin, Abram and McClelland (1996) found prevalence rates for major depression that were twice as high as those for females in the Epidemiologic Catchment Area study (16.9% versus 7.6%). Overall major depressive episode was the most prevalent major mental disorder among the incarcerated females. Findings were very similar to those from another large-scale prison study in which 805 female prisoners from a different facility were also compared to females from the Epidemiologic Catchment Area study. In that study, Jordan, Schlenger, Fairbank, and Caddell (1996) found that 20,7% of female prisoners had major mood disorders compared to 16.6% of females in the Epidemiologic Catchment Area study.

Côté & Hodgins (1992) interviewed a random sample of 460 prisoners, of which 51 had diagnosable major depression. The authors found that, overall, significantly more homicide offenders (35%) compared to other offenders (21%) had a major mental disorder. However, further comparisons between the two groups regarding the prevalence of specific mental disorders did not yield any significant differences; homicide and other offenders did not differ significantly with regard to rates of major depressive disorder (14.9% versus 10.2%). The authors reported, however, that recurrent major depression characterised significantly more of the homicide offenders than the other offenders and that alcohol abuse associated with major depression significantly distinguished the homicide offenders. Interestingly, the authors found that in 83% of homicide offenders depression was present before they committed the homicidal act.

In a study of homicide offenders from Finland, Eronen, Hakola, and Tiihonen (1996) examined 693 individuals and found only slightly elevated rates of major depression among them. Prevalence rates for major depression in the general population were 1.8% for males and 2.9% for females in contrast to 3.0% among male and 6.0% among female homicide

offenders. The authors stated that male homicide offenders were significantly more likely (OR = 1.6) to experience major depression, while for female homicide offenders the association was not statistically significant (OR = 1.8).

In another study based on a sample of 1,087 homicide offenders, Schanda and colleagues (2004) compared rates of major mental disorders between prisoners and individuals from the general population. The authors reported that among the homicide offenders, 0.7% of males and 5.6% of females had diagnosable major depression, in contrast to 1.6% males and 2.9% females among the general population controls. Although not statistically significant, female homicide offenders tended to have twice the odds (OR = 2.2) of females in the general population to experience depressive episodes, while the odds for male homicide offenders to have depressive episodes were 50% lower (OR = 0.5) than for males in the general population. Similarly, the prevalence of major depressive plus manic episodes was, overall, 1.4% among the homicide offenders and 2.4% in the general population controls. The authors concluded that major depressive and manic episodes showed no significant association with increased odds of homicide (OR 0.6). Only comorbid alcohol abuse led to a moderately but statistically significant positive association between major depression and homicide (OR = 3.1).

More recently, in a follow-up study of Bebbington and colleagues' (2017) evaluation of UK prisoners' mental health needs, Tyler and colleagues (2019) examined 469 prisoners (72.1% male, 27.9% female) and found similarly, remarkably high rates of mood disorders (58.8%), with significantly higher prevalence rates among females than males (73.2% versus 51.8%). In line with these findings, Binswanger and colleagues (2010) reported that depression and bipolar disorders were exceptionally common among female prisoners. In their analysis of data from a nationally representative sample of 6,982 US prisoners (88.4% male, 11.6% female) they found that among male prisoners, 17.4% reported depressive and 8.7% bipolar disorders, while the corresponding numbers for female prisoners were much higher, with 25.5% of female prisoners reporting depressive and 20.7% reporting bipolar disorders.

In another study involving a representative sample of 1,478 Australian prisoners (81.7% male, 18.3% female), Butler, Indig, Allnutt, and Mamoon (2011) found that almost one fifth (19.9%) of all prisoners was diagnosed with affective disorders, with the prevalence significantly higher in female than in male prisoners (28.7% versus 17.9%). Their subgroup analysis revealed that among those with mood disorders, depression was the most common

disorder affecting approximately 16% of prisoners. Notably, the authors also found that among those diagnosed with affective disorders, 70.7% of females and 65.0% of males had comorbid substance use disorder. They concluded that there was a significantly higher rate of comorbidity among prisoners compared with the general Australian population (see also Kessler, Davis, & Kendler, 1997).

In summary, studies included in this review have demonstrated overall high prevalence rates of affective disorders among individuals in contact with the criminal justice system, with depression being more prevalent in prisoners than in members of the community at large. This finding is rather consistent over time as systematic reviews by Fazel and colleagues (2002, 2012) have shown. While systematic reviews did not find significant differences in rates of depression between male and female prisoners or between remand and sentenced prisoners, more recent studies have found marked gender differences as would be expected from general population rates (e.g., Tyler and colleagues, 2019). Female prisoners typically reported significantly higher levels of depression than male prisoners. However, differences between remand and sentenced prisoners were rather small in all studies (e.g., Bebbington et al., 2017). In addition, studies reporting on comorbidity have demonstrated high rates of substance use disorders among prisoners, in particular in those with affective disorders (see also Fazel & Seewald 2012). Finally, the often cross-sectional design in many prison studies makes it difficult to fully disentangle the link between mood disorders and criminal behaviour. It is not clear whether the presence of affective disorders has contributed to the individual's offending in the first place or whether it is rather the case that depression has developed as a consequence of life in prison, for instance. Overall, however, rates of pre-existing and current affective disorders seem to be comparatively high among prisoners.

Community setting. Numerous large-scale studies on the prevalence of mood disorders in the general population have been carried out since the 1980s. Yet, overall prevalence rates of mood disorders in community studies vary considerably and their association to offending is, as of yet, unclear.

Using data from the Epidemiologic Catchment Area study, Swanson, Holzer, Ganju and Jono (1990) examined the association between violent behaviour in 10,024 individuals with and without diagnosable major depression and bipolar disorder in a randomly selected community sample. The authors observed slightly elevated rates of violence among individuals with diagnosable mood disorders and found a statistically significant but modest positive association. It was stated that the prevalence of mood disorders was three times

higher among individuals who were violent than among those who were not, with 11.1% of those with diagnosable mood disorders reporting violent behaviour in contrast to only 2.1% of those without mental health.

Likewise, a number of community-based studies from Nordic countries (Hodgins, Mednick, Brennan, Schulsinger, & Engberg, 1996; Tiihonen, Isohanni, Räsänan, Koiranen, & Moring, 1997) and Australasia (Arsenault , Moffitt, Caspi, Taylor, & Silva, 2000; Wallace et al., 1998) also suggested that there may be a weak but significant link between affective disorders and offending behaviour in the community.

In a large-scale Danish birth cohort study, Hodgins, Mednick, Brennan, Schulsinger, and Engberg (1996) examined 324,401 individuals (51% male, 49% female) and found that major mental disorders[9] were associated with an increased risk of arrest. Among males, 13.3% of never-treated individuals had a criminal record, compared with 19.9% with a diagnosis of psychotic depression and 27.1% with a diagnosis of bipolar disorder. Among females, 3.5% of never-treated individuals had a record of arrest, compared with 7.9% with a diagnosis of psychotic depression and 10.0% with a diagnosis of bipolar disorder. Additionally, the risk of violence convictions was also found to be increased among individuals with major affective disorders. While only 3.3% of males and 0.2% of females without diagnosable mental disorders had at least one violence conviction, 6.3% of males and 0.6% of females with major affective disorders were previously convicted of such offences (Brennan, Mednick, & Hodgins, 2000). Notably, Brennan and colleagues (2000) stated, that when controlling for comorbid substance use and personality disorders, individuals with affective disorders were no longer at higher risk for violent crime compared to those who were never hospitalised. The authors concluded that a diagnosis of mood disorder was moderately associated with slightly higher rates of arrests for criminal offences in general, but not significantly associated with arrests for violence.

In a Finish birth cohort study, Tiihonen, Isohanni, Räsänan, Koiranen, and Moring (1997) investigated a sample of 12,058 individuals and found that affective disorders with psychotic features were significantly associated with offending behaviour. The authors estimated that those with affective disorders had six times (OR = 6.3) the odds to commit an offence and eight times (OR = 8.8) the odds to commit a violent offence compared with those without diagnosable psychotic disorders. However, numbers for specific disorder subtypes

[9] Major mental disorders included diagnoses of schizophrenia and major affective disorders.

were extremely small in this study: Only six males and three females were diagnosed with a major affective disorder and of those, only three males and none of the females were convicted of crimes.

In an Australian case linkage study, Wallace and colleagues (1998) investigated a sample of 3,838 males, of which 1,998 had a conviction for violent offences and 152 for homicide. The authors found a significant association between convictions for offences involving violence and prior treatment for affective disorders. Among males who were convicted for violent offences, 2.0% had a diagnosable affective disorder and among those convicted of homicide, 2.6% had been treated for affective disorders. Males with affective disorders were reported to have about four times the odds (OR = 4.1) to receive a conviction for serious violence and five times the odds (OR = 5.4) to commit homicide compared with the general population. The authors concluded that, overall, males with affective disorders were significantly more likely to have convictions for different types of crimes, including violent offences and homicide, even when controlling for substance use disorder. However, they noted that comorbid substance use disproportionately increased the link between affective disorders and violence convictions.

The following studies focused more strongly on specific subtypes of mood disorders. For instance, using data from the Dunedin Multidisciplinary Health and Development Study (Silva & Stanton 1996), Arseneault, Moffitt, Caspi, Taylor and Silva (2000) studied 961 young adults from a total-city birth cohort in New Zealand. They found that of the 172 individuals with depressive disorder, 15.7% had a criminal conviction or reported violent behaviour, compared with 3.8% among individuals without diagnosable disorders. The authors estimated that individuals with depression had almost twice the odds of those without any disorders to report violent behaviour (OR = 1.7). They concluded that depression was weakly related to violence, however, the association rendered insignificant after controlling for comorbidity.

A similar observation was made in an Israeli study conducted by Stueve and Link (1997), which involved 2,678 individuals from a community sample, of which 519 individuals met criteria for major depression and 123 for bipolar disorder. Among those without any diagnosable disorders, 8,1% reported recent fighting in contrast to 11.1% individuals with diagnosable major depression and 23.7% with diagnosable bipolar disorder. The corresponding number for recent weapon use were 1.1% among individuals without diagnosable disorders in contrast to 1.7% individuals with diagnosable major depression and

6.7% with diagnosable bipolar disorder. The authors concluded that while recent fighting and weapon use were significantly elevated among individuals diagnosed with bipolar disorder, even when controlling for comorbidity, there was no significant association between major depression and violent behaviour.

More recently, Corrigan and Watson (2005) used data from the National Comorbidity Survey (Kessler, 1994) and examined 5,865 individuals, out of which 992 met criteria for major depression and 93 met criteria for bipolar disorder. Among those without diagnosable disorders, 1.9% reported violent behaviour, in contrast to 4.6% individuals with major depression and 12.2% with bipolar disorder. The authors estimated that individuals with diagnosable depression were more likely to report violent behaviour than those without diagnosable mental health problems (OR = 3.8). A much higher rate was found for individuals with diagnosable bipolar disorder (OR = 9.5). Notably, the authors reported that violent behaviour was much more frequent in individuals with comorbidities, specifically co-occurring substance use disorders significantly increased the prevalence of violent behaviour. They also stated that recent symptoms, rather than the mere presence of the disorder, better explained violent behaviour. However, for individuals with a lifetime diagnosis of substance use disorders this was not true; these individuals still had a four to six-time higher rate of violent behaviour compared to those without mental health problems. Findings suggested that substance use disorders and recent symptoms accounted for most of the relationship between affective disorders and violent behaviour.

In another large-scale longitudinal study, Elbogen and Johnson (2009) examined 34,653 individuals from a representative US sample. The authors found that, overall, 3,138 individuals reported a diagnosis of major depression and 458 a diagnosis of bipolar disorder. Among those with major depression, 2.1% showed violent behaviour compared with 3.0% in non-depressed individuals. Among those with bipolar disorder, 3.5% reported violent behaviour in contrast to 2.9% of individuals without a diagnosis of bipolar disorder. Based on this finding, the authors concluded that violence was not predicted by major depression or bipolar disorder alone. However, Elbogen and Johnson (2009) observed that comorbid substance use disorders significantly increased the risk of violence. The odds ratio for those with comorbid substance use disorders and depressive disorder was 1.7 and for those with comorbid substance use and bipolar disorders it was 1.6.

Using data from the National Epidemiologic Survey on Alcohol and Related Conditions (Grant et al., 2003, 2004), Van Dorn, Volavka, and Johnson (2012), examined

32,653 individuals from a nationally representative household survey in the US. The authors found that among those with no mental or substance use disorders the prevalence of violence was 0.8% in contrast to 4.9% among individuals with a diagnosis for bipolar disorder and 2.7% among those with major depression. They estimated that a past year major depression diagnosis was weakly associated with violent behaviour (OR = 1.4). For bipolar disorder, the risk was slightly more increased with a significant odds ratio of 2.1.

In a recent Swedish study, Fazel, Lichtenstein, Grann, Goodwin, and Långström (2010) matched 3,743 individuals with a diagnosis of bipolar disorder (56.3% male, 43.7% female) with 37,429 individuals from the general population and 4,059 unaffected full-siblings of those individuals with bipolar disorder. They found that during the follow-up period, 8.4% of individuals with bipolar disorder committed crime, in contrast to 3.5% of the general population controls. People with a diagnosis of bipolar disorder had twice the odds (OR = 2.3) of those without diagnosable bipolar disorder to commit a violent offence. The authors noted that the risk increase was marginal in bipolar individuals without comorbid substance use disorders (adjusted OR = 1.3), which decreased even further when unaffected full-siblings of individuals with bipolar disorder were used as controls (OR = 1.1 ns). They concluded that comorbid substance use disorders accounted for much of the association between bipolar disorder and violence (OR = 6.4).

In a repetition of this study focusing on major depression, Fazel and colleagues (2015) matched 47,158 individuals with a diagnosis of depressive disorder (36.6% male, 63.4% female) with 898,454 individuals form the general population and 15,534 unaffected half-siblings and 33,516 full-siblings of those individuals with depressive disorder. They found that during the follow-up period of 3.2 years, 3.7% of males and 0.5% of females with depressive disorder committed crime, in contrast to 1.2% males and 0.2% females in the general population controls. Those with a diagnosis of depressive disorder were at threefold increased odds of committing violent crime compared with the general population controls (OR = 3.0). Notably, the association remained significant after adjustment for a number of individual, familial and sociodemographic factors, including a history of substance use disorders and criminal behaviour. However, the strength of the association was reduced. In addition, they found that odds of violent crime in half- and full-siblings were also significantly higher than in the general population controls (OR = 1.2 and OR = 1.5, respectively), suggesting that family background may be a confounding factor in the association between depression and criminal behaviour. The authors concluded that a diagnosis of depression modestly but significantly increased the risk of violent criminal

behaviour. They also stated that, overall, a history of violent offending had the largest effect in terms of change in absolute risk of violent crime for individuals with a diagnosis of depression.

In a longitudinal study based on a sample of 949 adolescent offenders (86% male, 14% female) from the Pathways to Desistance study, El Sayed and colleagues (2016) estimated that 10% met diagnostic criteria for an affective disorder (including depression, dysthymia, or mania). Overall, their analysis revealed that the mere presence of mood disorders did not significantly increase the likelihood of future offending. They concluded that for serious offenders, mental health problems may only be "one of a constellation of issues related to subsequent offending—and possibly not the most influential one at that" (p. 296).

Using the youngest sample of the Pittsburgh Youth Study, Jolliffe and colleagues (2019) investigated the association between depression and delinquency among 503 boys. The authors estimated a hierarchical linear random effects model and found evidence suggesting that offending, in particular theft and serious violence, was associated with later increases in depression. They concluded that depression is more likely to be an outcome of offending as opposed to one of its causes. Similarly, in an earlier study based on the same sample, Defoe, Farrington, and Loeber (2013), used structural equation modelling to investigate the association between depression, anxiety and delinquency and came to a very similar conclusion, stating that depression was not found to be a risk factor for delinquency. With regard to this observation, Jolliffe and colleagues (2019) stated that if these findings prove to be robust, then there has to be a "significant shift in the conceptualisation of the relationships" (p. 7).

In line with previous findings, a recent study based on a sample of 856 individuals (50.9% male, 41.1% female) from the Columbia County Longitudinal Study found significant longitudinal relations from offending to subsequent severe depression and weaker longitudinal relations from experiencing severe depression to subsequent offending (Huesmann, Boxer, Dubow, & Smith, 2019). The authors reported that individuals with severe depression at age 48 were significantly more likely to have reported offending behaviour in earlier periods of their lives, from ages 21 to 48. However, findings indicated as well that those who reported severe symptoms of depression at age 30 were also significantly more likely to report subsequent offending behaviour between ages 31 to 48.

Overall, community-based studies have demonstrated slightly higher rates of criminality among individuals with affective disorders compared to the general population. In

almost all community studies, mood disorders were associated with a weak increase in criminality (but see Defoe, Farrington, & Loeber, 2013; Elbogen & Johnson, 2009; Jolliffe et al., 2019). However, this appears to hold true more for bipolar disorder than for major depression. In a majority of studies, individuals with bipolar disorder reported higher rates of criminality than individuals with depressive disorder. The odds of offending among individuals with depression were less elevated and usually rendered insignificant after adjusting for comorbidity, particularly in terms of previous offending or comorbid substance use disorders. Only one recent study found a modest but significant increase in risk of violence among individuals with depression even after controlling for a variety of possible confounders (Fazel et al., 2015) and it is, as of yet, unclear why. It may be possible that despite their rigorous research design, unmeasured confounders, as indicated by an equally increased risk of offending in siblings of individuals with depression, influenced the association. Further, it should also be noted that individuals with depression were reported to be more likely to be convicted of crimes, not that they committed more crimes. In summary, affective disorders have been shown to be associated with a wide range of adverse outcomes, however, their association to violence or criminal behaviour is less clear and seems rather insignificant based on findings from community studies reviewed in this thesis.

Conclusion. In summary, findings on the association between affective disorders and offending point into different directions. Although studies indicated a slight increase in risk of offending in individuals with affective disorders, in particular among those with bipolar disorder, research also suggests that affective disorders alone are not associated with an increased risk of offending, particularly with regard to more serious violent acts.

Overall, the prevalence of patients with affective disorders only is relatively low in clinical samples and research suggests that, if anything, then a higher risk of offending may be found during acute manic episodes of bipolar disorder. In contrast, prison studies have found high rates of affective disorders among incarcerated offenders. However, despite the fact that depressive and bipolar disorders are overrepresented in the criminal justice system, the symptoms themselves seem to relate only weakly to the criminal behaviour. Similarly, community-based studies reported an overall weak association between affective disorders and offending. In fact, recent studies concluded that most criminal behaviour in individuals with depressive or bipolar disorders is due to comorbid substance use disorders and that depression is more likely to be an outcome of offending than one of its causes.

In conclusion, it can be said that based on different sample populations (i.e., psychiatric patients, incarcerated offenders, community residents), study designs (i.e., cross-sectional, longitudinal) and assessment measures of offending behaviour (i.e., self-reports, official records), research shows that there is only a weak, often insignificant, association between offending behaviour and affective disorders.

4.4.3 Offending and anxiety disorders

As with research on affective disorders, studies on the association between anxiety disorders and offending behaviour are comparatively rare. The majority of published research on anxiety disorders is based on prison samples and many studies investigate the broad umbrella of anxiety disorders combined, instead of differentiating between specific subtypes (e.g., generalsied anxiety disorder, posttraumatic stress disorder, social anxiety disorder).

Initially, it seems counterintuitive to associate anxiety with disruptive or offending behaviour and in fact, in the past, it was thought that anxiety limits criminal activity (e.g., Hodgins, De Brito, Chhabra, & Côté, 2010). However, there is also some evidence indicating that people with anxiety disorders have a slightly higher than average risk of offending (e.g., Corrigan and Watson 2005), and that there is an overall high prevalence of anxiety disorders among people in contact with the criminal justice system (Butler et al., 2006; Indig, Gear and Wilhelm, 2016). Hence, while there seems to be some consensus that anxiety disorders are associated with a decreased risk of offending (e.g., Defoe, Farrington, and Loeber 2013; Jolliffe et al., 2019; Modestin, Thiel, & Ernie, 2002), this may not be true for specific types of anxiety disorders and certain groups of offenders (e.g., Kafka, & Hennen, 2002; Nunes, McPhail, & Babchishin, 2012; Raymond, Coleman, Ohlerking, Schristenson, & Miner, 1999).

Defoe, Farrington, and Loeber (2013) have addressed this apparently paradoxical relationship between anxiety and offending behaviour and summarised it as follows: “depression is positively related to delinquency but also positively related to anxiety which is negatively related to delinquency” (p. 105). Anxiety symptoms seem to behave in contradictory ways in individuals, while some offenders display significantly elevated levels of anxiety, others with similar externalising problems show significantly lower levels. Hence, the role of anxiety in the expression of externalising problems, including offending behaviour, is still unclear.

Clinical setting. Anxiety disorders are very common mental health conditions and despite their severity some of the most treatable psychiatric disorders (Pine, 2017, as cited in

NIH, 2017). Individuals with anxiety disorders have typically only limited contact with inpatient services and the majority of help-seeking individuals with an anxiety disorder receives outpatient treatment. Notably, a few studies have shown that, in fact, most individuals with an anxiety disorder never seek treatment (e.g., Henderson, 2002). Inpatient treatment (i.e., hospitalisation) is typically reserved for more severe cases and those at highest risk. Hence, the prevalence of patients with anxiety disorders is comparatively low in clinical samples and there are only relatively few studies examining specifically the offending behaviour of those patients with anxiety.

In one such study, Apter, Plutchik, and van Praag (1993) interviewed a sample of 60 patients (50% male, 50% female) from inpatient wards of the Bronx Municipal Hospital Center and examined the link between anxiety disorders and violent offending. The author investigated both, state anxiety which relates to present feelings and trait anxiety which is defined as chronic long-term anxiety. Among nonviolent patients, the mean state anxiety score was 45.1 and the mean score for trait anxiety was 42.7, in contrast to a mean state anxiety score of 43.7 and a mean trait anxiety score of 49.3 among violent patients. The authors found that, while state anxiety was not associated with violent behaviour, trait anxiety was negatively associated with violence risk. Interestingly, they hypothesised that trait anxiety may reduce violence directed outwards but at the same time may increase violence directed inwards.

Modestin, Thiel, and Ernie (2002) investigated the relationship between anxiety and criminal behaviour in a sample of 278 inpatients (64.4% male, 35.6% female) and found that their predicted relationship between a lower criminal rate in anxious patients was confirmed for male but not for female patients. Overall, there was a higher prevalence of criminal behaviour among non-anxious males for all types of offences. Of the male patients, 83 were identified as having anxiety and of those, 27% had a criminal record while 2% reported violent behaviour. The corresponding rates among non-anxious patients were 51% for a criminal record and 3% for violent offending. Among female patients the authors did not find a significant difference in terms of numbers of convictions between non-anxious and anxious individuals (8% versus 6%). They concluded that male patients with anxiety had a significant lower rate of criminal convictions.

There is persuasive evidence from a range of studies that anxiety disorders are the most prevalent mental health conditions in children and adolescents (see e.g., Beesdo, Knappe, & Pine 2009 for a review; see also Ahonen, 2019). In a recent review of research on

anxiety disorders, Beesdo, Knappe, and Pine (2009) reported a lifetime prevalence of about 15% to 20% for any anxiety disorder in children, with separation anxiety disorder, specific phobias and social phobia as the most frequent disorders. Accordingly, anxiety disorders have a high prevalence in clinical samples of children and adolescents. Among those receiving psychiatric in- or outpatient treatment, comorbidity of anxiety disorders with other psychiatric disorders and disruptive behaviour problems is remarkably common. Research has shown that approximately one in four of those with a diagnosis of generalised anxiety disorder meet diagnostic criteria for an externalising disorder, including attention-deficit/hyperactivity disorder, oppositional defiant disorder and conduct disorder (e.g., Garland & Garland, 2001; Kendall, Brady, and Verduin, 2001; Masi et al., 2004).

In a study based on an inpatients sample of 173 children (61.8% male, 38.2% female) who were diagnosed with at least one anxiety disorder, Kendall, Brady, and Verduin (2001) found that 79% had at least one comorbid diagnosis. The authors stated that approximately 15.0% of children with an anxiety disorder met diagnostic criteria for attention-deficit/hyperactivity disorder, 9.2% met diagnostic criteria for oppositional defiant disorder and 1.2% had diagnosable conduct disorder. Similarly, Garland and Garland (2001) investigated oppositionality in an inpatient sample of 145 children (55.9% male, 44.1% female) and found that of the 66 children with a diagnosis of an anxiety disorder, 34% met diagnostic criteria for attention-deficit/hyperactivity disorder and 31% met diagnostic criteria for oppositional defiant disorder.

In a study based on 157 outpatients (61.8% male, 38.2% female) with a diagnosis of generalised anxiety disorder, Masi and colleagues (2004) reported that approximately 21% met diagnostic criteria for an externalising disorder, including attention-deficit/hyperactivity disorder, oppositional defiant disorder and conduct disorder. The authors found that males showed significantly more externalising problem behaviours than females (28% versus 10%). However, it is important to note that anxious children with comorbid externalising disorders had significantly higher rates of bipolar disorder diagnoses compared to those children with anxiety only (33% versus 6%), which might explain part of the association between anxiety and externalising disorders.

In summary, there are only few clinical studies that investigated specifically the risk of offending behaviour in patients with anxiety disorders. The few studies that exist tend to focus on samples of children and adolescents referred for treatment or investigated comorbidity in anxiety disorders and their association with externalising behaviour problems. Overall,

research has shown that adult patients with a diagnosis of anxiety disorders do not seem to have an increased risk of offending behaviour. In fact, studies have demonstrated that patients with anxiety disorders tend to be less likely to engage in violent behaviour or to have a criminal record. Among children treated for anxiety disorders in both in- and outpatients programmes, studies have found relatively high levels of behavioural problems, including oppositional defiant disorder and conduct disorder. Despite this observation, research has suggested that anxiety disorders alone are not associated with an increased risk of disruptive behaviour in children. Comorbidity of anxiety disorders and other psychiatric conditions is remarkably common in patients and is suggested to account for most of the relationship between anxiety-patient-status and externalising problems. Overall, only a small number of individuals with anxiety disorders is referred for inpatient treatment and clinical studies have shown that those who are, do not have a significantly increased risk of violence or offending behaviour. Notably, findings seem to indicate that this observation is not simply a reflection of the small number of anxiety disorders only patients in clinical samples, but an indication of overall low rates of criminal behaviour in anxious individuals in general.

Correctional setting. Despite the fact that studies on the mental health of prisoners often include anxiety disorders, there is only little published research on the association between specifically anxiety disorders and offending behaviour in prisoners. One possible reason for this could be that it may seem counterintuitive, at first, to associate a condition like anxiety with disruptive and offending behaviour, as the often quite over-generalised belief is that anxiety causes shyness and withdrawal, while conceptualisations of individuals with antisocial behaviour often suggest that these individuals have inhibitory deficits as well as overall low anxiety and fear (see e.g., Derefinko, 2015 for a review). As Defoe, Farrington. and Loeber (2013) mentioned, anxiety is often thought of as a protective factor against delinquency, and historically conceptualised as more likely to limit criminal activity (see also Hodgins, Barbareschi, & Larsson, 2011; Kerr, Tremplay, Pagani, & Vitaro, 1997).

Only few studies to date have investigated the association between offending behaviour and anxiety only. Most studies examine anxiety disorders as part of comorbid states or among specific populations diagnosed with other psychiatric disorders or health conditions. Overall, anxiety disorders have been found with relatively high prevalence in incarcerated offenders. However, rates of anxiety disorders in prison studies vary depending on which subtypes of anxiety disorders were included. Reported rates vary from just 1% among homicide offenders (Fazel & Grann, 2004) to 55% among female prisoners (Butler, Allnutt, Cain, Owens, & Muller, 2005).

In a number of comprehensive studies from Australasia researchers have compared prevalence rates of anxiety disorders in prisoners with those in the community. For instance, Butler and colleagues (2006) investigated a sample of 916 newly admitted prisoners (82.1% male, 17.9% female) who were assessed within 24-hours of admission and compared them to 8,168 community controls (48.5% male, 51.5% female). The authors estimated that prisoners had five times (OR = 5.1) the odds of individuals in the community to meet criteria for an anxiety disorder. The results showed that anxiety disorders were much more prevalent in the prison population than in the community (37.9% versus 13.4%). This was true for almost all subtypes of anxiety disorders (i.e., panic disorder, agoraphobia, generalised anxiety disorder and obsessive-compulsive disorder); only social phobia was slightly higher in the community sample compared with the prison sample (3.6% versus 1.3%). Posttraumatic stress disorder was found to be the most prevalent disorder in the prison sample with 25.6% of prisoners meting criteria in contrast to only 4.2% of community controls (OR = 10.2) (see also Butler, Indig, Allnutt, & Mamoon, 2011).

With regard to prisoner status, Butler, Allnutt, Cain, Owens, and Muller (2005) studied the prevalence of anxiety disorders in 1,487 mixed remand and sentenced prisoners. The authors reported that 38% of remand prisoners and 33% of sentenced prisoners had experienced anxiety in the preceding 12 months (OR = 1.2). In addition, they compared rates between male and female prisoners and found that the prevalence of anxiety disorders was substantially higher among female prisoners than in male prisoners (55% versus 32%). Female prisoners had almost three times the odds (OR = 2.6) of male prisoners to report an anxiety disorder. The most common disorder in this study was also posttraumatic stress disorder with 44% of female and 20% of male prisoners and 26% of remand and 21% of sentenced prisoners meeting diagnostic criteria.

Similarly, in a large-scale study among prisoners in England and Wales, Singleton, Meltzer, Gatward, Coid, and Deasy (1998) investigated psychiatric morbidity in a sample of 3,142 individuals and found that, overall, sleep problems and worry were the most common symptoms. Among prisoners on remand, 42% of female and 33% of male prisoners had diagnosable anxiety and among sentenced prisoners, the rates were 32% for female and 21% for male prisoners, respectively. Overall, rates were found to be higher in remand compared to sentenced prisoners and among female compared to male prisoners, though not statistically significant for prisoner status (i.e., remand versus sentenced prisoners).

In a study based on a sample of 192 prisoners from Vancouver, Corrado, Cohen, Hart, and Roesch (2000) found that 41.1% of prisoners had a diagnosable anxiety disorder. The most common diagnosis was generalised anxiety disorder, which affected 25% of prisoners, followed by posttraumatic stress disorder, which affected 11% of prisoners. In a study of 80 randomly selected Greek prisoners, Fotiadou, Livaditis, Manou, Kaniotou and Xenitidis (2006) found that anxiety disorders (i.e., symptoms of panic disorder, agoraphobia, social phobia, obsessive-compulsive disorder, and posttraumatic stress disorder) were the most prevalent mental health conditions, affecting 37.5% of prisoners.

In a Spanish study, Vicens and colleagues (2011) interviewed 707 male prisoners and reported that 45.3% of them met diagnostic criteria for a lifetime anxiety disorder and 12.4% for lifetime generalised anxiety disorder. Overall, anxiety was the most prevalent condition after substance use disorder. With regard to the last month prevalence, results were similar. 23.3% of prisoners reported symptoms of anxiety in the last month and 6.9% reported last month generalised anxiety disorder. Notably, the authors found anxiety to be the most common comorbid disorder with 54.5%.

In a large-scale study from the USA, Reingle Gonzalez, and Connell (2014) assessed anxiety disorders in a nationally representative sample of 18.185 prisoners and found that among the 3,686 federal prisoners, 4.6% had anxiety and 3.2% met criteria for posttraumatic stress disorder. Among the 14,499 state prisoners, 5.7% had anxiety and 5.7% suffered from posttraumatic stress disorder.

In the previously mentioned comprehensive evaluation study on the mental health needs of prisoners in the UK, Bebbington and colleagues (2017) examined a representative sample of 368 prisoners (53.5% male, 46.5% female) and found that anxiety disorders (including generalised anxiety disorder, phobia, and panic attacks) were extremely common in prisoners. Notably, this study reported overall higher anxiety rates in male than in female prisoners, with 29.1% of male and 24.3% of female offenders meeting criteria for an anxiety disorder. With regard to subtypes of anxiety disorders, the authors reported that they did not find significant differences in the rates of panic attacks between male and female prisoners (5.1% versus 5.9%), but phobias and posttraumatic stress disorder were more than twice as frequent in female compared with male prisoners (6.6% versus 16.0% and 4.6% versus 12.0%, respectively).

In a more recent study from New Zealand, Indig, Gear, and Wilhelm (2016) examined mental health problems among 1,209 prisoners and compared them to rates in the general

population. The authors reported that 30.3% of prisoners met diagnostic criteria for a lifetime anxiety disorder, in contrast to 24.9% in the general population. With regard to current symptomatology, the authors found that 22.5% met diagnostic criteria for a 12-months diagnosis, in contrast to 14.8% in the general population. Notably, nearly one in four (23.7%) of all prisoners had a lifetime diagnosis of posttraumatic stress disorder, which the authors reported to be four times higher than the general population rate (6.0%). Numbers were particularly high in female prisoners with 52.1% having a lifetime diagnosis of posttraumatic stress disorder and 39.9% a 12-months diagnosis. The corresponding rates for male prisoners were 22.0% for a lifetime diagnosis and 14.6% for a 12-months diagnosis. In line with previous research, the authors concluded that anxiety disorders were significantly higher among female compared with male prisoners (57.3% versus 28.7%) (see also Tye & Mullen, 2006).

A number of studies on the link between criminality and anxiety disorders has focused on specific subgroups of offenders and found comparatively low levels of anxiety in individuals convicted for more serious offending. In contrast to the relatively high prevalence rates presented above, Fazel and Grann (2004) investigated 2,005 homicide offenders in Sweden and found that only 1.4% of all homicide offenders had an anxiety disorder and notably only 0.5% met diagnostic criteria for posttraumatic stress disorder. In view of the fact that they reported that over 90% of their homicide offenders had a psychiatric diagnosis and that rates in their study tended to be double those found in other studies, it is interesting that prevalence rates for anxiety disorders were found to be so low.

In another study of homicide offenders from Finland, Eronen, Hakola, and Tiihonen (1996) investigated a sample of 693 prisoners and found, similarly to Fazel and Grann (2004), that homicide offenders were significantly less likely to have a diagnosable anxiety disorder. The estimated prevalence rates for any anxiety disorder in the general population was 4.7% for males and 9.7% for females, in contrast to only 1.5% among male homicide offenders and none of the female homicide offenders was diagnosed with anxiety. The authors estimated an odds ratio of 0.3 for homicide offenders to have a diagnosable anxiety disorder.

However, in two studies that examined mental disorders in specifically sex offenders, findings indicated that sex offenders might be slightly more anxious than non-offenders and as well as other offenders. Raymond, Coleman, Ohlerking, Schristenson, and Miner (1999) interviewed 45 paedophilic sex offenders and found that 64% of them met diagnostic criteria for a lifetime anxiety disorder and 53% had a diagnosable current anxiety disorder. Similarly,

in a study of 120 males with paraphilic disorders, out of which 60 males were registered sex offenders, Kafka and Hennen (2002) found that anxiety disorders were reported by 38.3% of the sample. The most common lifetime anxiety disorders were social phobia (21.6%), followed by generalised anxiety disorder (9.1%). Notably, compared with non-offenders, sex offenders in this sample were specifically more likely to report conduct, anxiety, and substance use disorders. A recent systematic review on the association between social anxiety disorder and sexual offending (Nunes, McPhail, & Babchishin, 2012) found similar evidence for increased social anxiety among sex offenders. With regard to this finding, it has been suggested that the fact of being convicted of a sex offence may promote the development of social anxiety through, for example, social rejection, isolation, judgment, guilt and shame (see e.g., Hunter, & Figueredo, 2000; Marshall, Marshall, Serran, & O'Brien, 2009). While numerous studies on mental health problems in sexual offenders have reported high prevalence rates of anxiety disorders, results must be interpreted with caution as findings are usually based on small samples and offenders with comorbid psychiatric diagnosis.

With regard to comorbidity, anxiety disorders have been shown to be among the most common comorbid psychiatric disorders (e.g., Vicens et al., 2011). In a recent study on comorbidity, Butler, Indig, Allnutt and Mamoon (2011) investigated a sample of 1,478 prisoners (81.7% male, 18.3% female) drawn from 29 Australian prisons and found high rates of co-occurring psychiatric and substance use disorders. Overall, they reported a prevalence rate of 36.2% for anxiety disorders, with 55.2% of female prisoners and 31.8% of male prisoners meeting diagnostic criteria. With regard to comorbidity, the authors found that among prisoners with affective disorders (depression was the most prevalent with 16%), 73% of male and 82% of female prisoners were also diagnosed with an anxiety disorder.

As in clinical studies, evidence for a high co-occurrence of anxiety disorders and other internalising and externalising behaviour problems has particularly often been found in studies of children and adolescents in detention. In a recent systematic review on the role of anxiety in childhood aggression, Granic (2014) found that the majority of aggressive children exhibits symptoms of anxiety. The prevalence of anxiety disorders reported by studies included in her review ranged from 60% to 75%. Based on her findings, Granic (2014) suggested that anxiety may be a "key causal engine in most acts of reactive aggression" (p. 1516). In another comprehensive review on the link between psychopathology and delinquency, Vermeiren (2003) studied the prevalence of anxiety disorders in incarcerated youths and estimated the prevalence rate of anxiety to range between 22% and 62% among

delinquent adolescents. However, the author suggested that the surprisingly high prevalence of anxiety disorders in young delinquents might be associated with prison life itself.

Overall, numerous studies have reported that conduct problems in juvenile offenders are positively associated with anxiety disorders and similar trends, although less marked, seem to exist in adult prison populations. In a large-scale study, Hodgins, De Brito, Chhabra, and Côté (2010) investigated the prevalence of comorbid anxiety disorders among offenders and its association with violent offending. Based on a random sample of 495 male prisoners, out of which 279 had a diagnosis of antisocial personality disorder, 63.8% met diagnostic criteria for a lifetime anxiety disorder (69.5% including posttraumatic stress disorder). Notably, the authors found that two-thirds of offenders with lifetime anxiety disorders had not experienced an episode in the past six months, leading the authors to suggest that anxiety may not simply be a result of being incarcerated as proposed by Vermeiren (2003). In fact, Hodgins and colleagues (2010) found that half of all prisoners with co-occurring anxiety and antisocial personality disorders reported that the onset of their condition was during adolescence. With regard to offending behaviour, the authors found that among those with antisocial personality disorder, there were no significant differences in the mean number of convictions for violent offences between prisoners with and without an anxiety disorder. However, a higher percentage of prisoners with comorbid anxiety disorders, as compared to those without, had a conviction for serious crime involving interpersonal violence.

In summary, the reviewed studies show that anxiety disorders are very common among incarcerated offenders, with often much higher prevalence rates than in the community at large. The most common anxiety disorder in prisoners across all studies was posttraumatic stress disorder. Further, all studies found significant differences in rates of anxiety disorders between male and female prisoners, with female prisoners typically reporting significantly higher levels than male prisoners, as would be expected from general population rates. However, differences between remand and sentenced prisoners were rather small in most studies and often not statistically significant. In addition, studies differentiating between subgroups of offenders have found overall very low rates of anxiety disorders in homicide offenders, while offenders convicted of interpersonal violence and sex offences reported considerably higher rates. Sexual offending has been found to be particularly associated with higher levels of social anxiety (e.g., Kanters et al., 2016; Nunes, McPhail, & Babchishin, 2012). The previously mentioned high rates of comorbidity in anxiety disorders were also found in offender-based samples. The most prevalent comorbid disorders were depression, substance use and externalising disorders, such as conduct and antisocial personality disorder.

However, the often cross-sectional design of many prison studies makes it difficult to fully disentangle the link between anxiety disorders, other psychiatric conditions, and criminal behaviour. Only a small body of research based on incarcerated offenders has investigated the timing of the relationship. For most studies it remains unclear whether the presence of anxiety disorder symptoms has contributed in any way to the individual's offending or whether it is rather that symptoms of anxiety disorders develop as a consequence of life in prison.

Community setting. A number of studies has investigated the association between anxiety disorders and offending behaviour in the community. However, prevalence rates of anxiety disorders vary considerably and their precise association to offending is not clear yet.

Using data from the Epidemiologic Catchment Area study, Swanson, Holzer, Ganju, and Jono (1990) examined violent behaviour in 10,024 individuals with and without diagnosable anxiety disorders from a randomly selected community sample. The authors found slightly elevated rates of violence in individuals with anxiety. While violent behaviour was reported by 2.1% without any diagnosable psychiatric disorders, 9.1% of those with diagnosable anxiety disorders reported violent behaviour. The authors concluded that even though the prevalence of violence was higher among individuals with an anxiety disorder, compared to those with diagnosable schizophrenia or mood disorders, the difference between anxious and non-anxious individuals was less marked.

In an Israeli community-based study, Stueve and Link (1997) investigated 2,678 individuals, of which 319 met criteria for generalised anxiety disorder. Among those without diagnosable disorder, 8.1% reported recent fighting in contrast to 10.9% individuals with diagnosable generalised anxiety disorder. The corresponding numbers for recent weapon use were 1.1% among individuals without diagnosable disorders and 1.3% among individuals with generalsied anxiety disorder. The authors concluded that individuals with generalised anxiety disorder were not more likely than those without any disorders to report recent violence.

Likewise, in a study based on a sample of 778 boys from the Montreal Longitudinal-Experimental Study, Kerr, Tremblay, Pagani, and Vitaro (1997), found that behavioural inhibition (i.e., anxiety) protected boys against delinquency (OR = 0.2). Notably, however,

they found that social withdrawal[10] was not protective. In fact, disruptive withdrawn boys were at the greatest risk for delinquency (OR = 2.7).

Using data from the Dunedin Multidisciplinary Health and Development Study, Arseneault, Moffitt, Caspi, Taylor, and Silva (2000) studied 961 young adults from a total-city birth cohort in New Zealand. They found that of the 170 individuals with an anxiety disorder, 12.4% had a criminal conviction or reported violent behaviour, compared with 3.8% individuals without diagnosable disorders. Although, results were marginally significant, the authors concluded that a diagnosis of anxiety disorder was not significantly associated with a higher risk of conviction (OR = 1.8). Notably, of all psychiatric disorders investigated in this study, anxiety disorders were the only ones that were not linked to an increased risk of violent behaviour or convictions.

Corrigan and Watson (2005) used data from the National Comorbidity Survey (Kessler, 1994) and examined anxiety disorders among 5,865 individuals. Of the participants, 429 individuals had a lifetime diagnosis of post-traumatic stress disorder, 294 met diagnostic criteria for a lifetime generalised anxiety disorder and 200 had a lifetime panic disorder. The corresponding numbers for 12-month disorder prevalence were 223 individuals with posttraumatic stress disorder, 171 with generalsied anxiety disorder and 129 with panic disorder. Among those without diagnosable disorders, 1.9% reported lifetime violent behaviour, in contrast to 5.8% with a lifetime diagnosis of posttraumatic stress disorder, 4.2% with a lifetime diagnosis of generalised anxiety disorder and 6.1% of those with a diagnosis of panic disorder. The violence rates for individuals with a 12-month diagnosis of post-traumatic stress disorder was 7.5%, for those with generalsied anxiety disorder it was 6.4% and for those with a diagnosis of panic disorder 8.4%. The authors stated that, compared to those without a diagnosable psychiatric disorder, individuals with an anxiety disorder were significantly more likely to report violent behaviour (OR = 3.4). In line with previous research, they also stated that violent behaviour was much more frequent in individuals with comorbidities. Findings suggested that substance use and recent symptoms account for most of the relationship between anxiety disorders and violent behaviour.

Using data from the National Epidemiologic Survey on Alcohol and Related Conditions (Grant et al., 2003, 2004), Van Dorn, Volavka, and Johnson (2012)**,** examined 32,653 individuals from a nationally representative household survey in the US. They

[10] Conceptualised as "a nonanxious preference for solitary activity or a failure to be rewarded by social interaction or others' approval" (p. 810).

estimated that 5,240 of study participants met diagnostic criteria for an anxiety disorder (including generalised anxiety disorder, specific and social phobias, hypomania, panic disorder and agoraphobia). Further, their analysis showed that among those with no mental or substance use disorders, the prevalence of past year violence was 0.8%, in contrast to 1.7% among individuals with a diagnosis of an anxiety disorder. They estimated that a diagnosis of anxiety disorder was not significantly associated with violent behaviour (OR = 1.2). Notably, the odds ratio increased to 2.3 for individuals with a comorbid anxiety and substance use disorder.

In a study based on a sample of 949 juveniles (86% male, 14% female) from the Pathways to Desistance study, El Sayed and colleagues (2016) estimated that 22% of participants met diagnostic criteria for any anxiety disorder. However, their analysis revealed that the mere presence of anxiety did not significantly increase the risk of future offending. They concluded that for serious offenders' mental health problems may only be "one of a constellation of issues related to subsequent offending—and possibly not the most influential one at that" (p. 296).

Using the youngest sample of the Pittsburgh Youth Study, Jolliffe and colleagues (2019) investigated the association between anxiety and delinquency among 503 boys. The authors estimated a hierarchical linear random effects model and found evidence suggesting that offending, in particular theft and serious violence, was associated with increased levels of anxiety. Notably, they concluded that anxiety is more likely to be an outcome of offending as opposed to one of its causes (see also Defoe, Farrington, & Loeber, 2013).

In line with previous findings, a recent study based on a sample of 856 individuals (50.9% male, 41.1% female) from the Columbia County Longitudinal Study, Huesmann, Boxer, Dubow, and Smith (2019) found significant longitudinal relations from offending to subsequent anxiety and weaker longitudinal relations from severe anxiety to subsequent offending. The study's main finding was that individuals with serious anxiety at age 30 or age 48 were significantly more likely to have reported offending behaviour in earlier periods of their lives, from ages 18 to 30 or 48, respectively. However, findings indicated as well that those who reported serious symptoms of anxiety at age 19 or 30 were also more likely to report subsequent offending behaviour. However, the latter associations were only marginally significant.

In summary, community-based studies included in this review did not find significantly elevated levels of offending behaviour in individuals with anxiety disorders. The

odds of offending in anxious individuals were rather small and typically rendered insignificant after adjusting for comorbidity, specifically comorbid substance use disorders. A majority of studies concluded that the mere presence of an anxiety disorder did not significantly increase the risk of future offending. In fact, studies that investigated longitudinal relations stated that anxiety is more likely to be an outcome of offending behaviour than one of its causes. Overall, anxiety disorders seem to be associated with a wide range of adverse outcomes, however, their association to criminal behaviour appears rather insignificant based on findings from community studies.

Conclusion. Although a number of studies has demonstrated slightly higher rates of offending behaviour in individuals with anxiety disorders, overall research suggests that anxiety alone is not associated with an increased risk of offending.

The number of patients with a primary diagnosis of anxiety disorder is comparatively small in clinical samples and studies have indicated that these individuals tend to be less likely to offend and that any associations between anxiety-patient-status and offending behaviour can be accounted for largely by comorbidity with other mental disorders or co-occurring substance use disorders. Prison studies, however, have found comparatively high levels of anxiety disorders in incarcerated offenders and overall findings point towards a more complex picture. However, despite the fact that anxiety disorders are overrepresented in the criminal justice system, symptoms have been shown to relate only weakly to criminal behaviour and as such, it has been suggested that anxiety may rather be associated with life in prison and its consequences. Likewise, the association between anxiety disorders and offending behaviour in the community has also been consistently reported as relatively weak. The majority of studies did not find significantly elevated levels of offending in individuals with anxiety and suggested that most criminal behaviour can be accounted for largely by demographic and historical characteristics as well as comorbid substance use disorders. Notably, the high levels of comorbidity found in clinical samples were mirrored in community samples, as well. In line with these findings, studies focusing on the timing of the relations between anxiety disorders and offending behaviour have suggested that anxiety is more likely to be an outcome of offending behaviour than one of its causes.

In conclusion, it can be said that based on different sample populations (i.e., psychiatric patients, incarcerated offenders, community residents), study designs (i.e., cross-sectional, longitudinal) and assessment measures of offending behaviour (i.e., self-reports, official records), research shows that there is only a weak, often insignificant, association

between offending behaviour and anxiety disorders and findings indicate that anxiety may be more likely to emerge as a consequence of offending or the contact with the criminal justice system.

4.4.4 Offending and personality disorders

A number of studies has investigated the link between personality disorders and aggressive, violent or offending behaviour. There is evidence, that rates of personality disorder diagnoses are higher in prisoners (see e.g., Fazel & Danesh, 2002 for a review), in violent psychiatric patients (e.g., Gray, Taylor, & Snowden, 2011; Posternak, & Zimmerman, 2002; Sarkar, 2019; Soliman, & Reza, 2001) and in individuals who commit criminal offences in the community (e.g., Coid, Yang, Tyrer, Roberts, & Ullrich, 2006; Johnson et al., 2000). However, measurement of all personality disorders is infrequently carried out in studies of criminal behaviour and only few have investigated specifically cluster A and cluster C diagnoses and their relationship to violence and offending.

The majority of published research on personality disorders and criminality is based on offender and clinical samples and focuses on cluster B, specifically borderline and antisocial personality disorders. While specifically antisocial personality disorder is often claimed to be a risk factor for offending behaviour and a lot of research indicates that it accounts for most of the relationship between offending and personality disorders, this association is rather unsurprisingly, given that aggressive, deviant, and unlawful behaviour constitute symptoms of antisocial personality disorder (see Section 2.2.4). Overall, little is known about associations between offending behaviour and other personality disorders and to what extent they may be associated with elevated levels of offending behaviour.

Clinical setting. Personality disorders are relatively serious conditions that are often connected to more complicated and impairing symptoms. Thus, many people with personality disorders are in contact with mental health services and research has found that they often have extensive histories of in- and outpatient treatment (Ansell, Sanislow, McGlashan, & Grilo, 2007; Bender et al., 2001; Borschmann & Moran, 2011; Lewis, Fanaian, Kotze, & Grenyer, 2019).

Recent studies have shown that having a personality disorder is significantly associated with a greater number of hospital admissions (e.g., Evans, Harris, Newman, & Beck 2017; Lewis, Fanaian, Kotze, & Grenyer, 2019) and clinical evidence suggests that people with specifically borderline personality disorder are more likely than any other

psychiatric disorder group to represent to emergency or to be readmitted to an inpatient mental health unit (Leontieva & Gregory 2013; Penfold et al., 2016). Borderline personality disorder is one of the most frequently investigated conditions in clinical studies and it seems that there is a high prevalence of patients with borderline personality disorder in all types of clinical settings, with approximately 9% among psychiatric outpatients (Zimmerman, Rothschild, & Chelminski, 2005) and 20% among psychiatric inpatients (Zimmerman, Chelminski, & Young 2008), compared to a community prevalence of 1% to 2% (e.g., Paris, 2010).

With regard to offending, a recent selective review of the literature on the association between borderline personality disorder and violence has found that borderline personality disorder is also overrepresented in clinical samples of patients with histories of violence and criminal behaviour (Sarkar, 2019). Specifically, Sarkar (2019) reported that criminal conduct was particularly elevated among patients with comorbid borderline and antisocial personality disorders. Interestingly, Porcerelli, Cogan, and Hibbard (2004) asked 52 clinicians to describe a patient who was violent towards their partner and descriptions showed that these violent patients had a high number of borderline and antisocial personality disorder features. In fact, these two personality disorders are the most frequently studied in the context of violence and offending behaviour among patients with personality disorders. Overall, clinical evidence suggests that patients with a diagnosis of personality disorder are at greater risk of offending behaviour. However, the association is not straightforward and varies by personality disorder cluster. As there are many personality disorders, it is not clear whether all subtypes are associated with elevated rates of offending behaviour.

Numerous studies on offending in psychiatric patients have focused on antisocial and borderline personality disorders. For instance, in a study based on 474 patients from an acute adult psychiatric unit in England, Soliman and Reza (2001) investigated violent behaviour among inpatients with dissocial (i.e., antisocial) and emotionally unstable (i.e., borderline) personality disorders. Among the 49 patients classified as violent (57.1% male, 42.9% female), 20.4% had a diagnosis of antisocial or borderline personality disorder, compared with only 4.3% among the 280 non-violent patients (50.4% male; 49.6% female). The authors estimated that a diagnosis of dissocial (i.e., antisocial) or emotionally unstable (i.e., borderline) personality disorder was the strongest predictor of violent behaviour among inpatients.

In another comprehensive study, Carr and colleagues (2008) investigated a sample of 86.688 inpatients (55.6% male, 44.4% female) from eleven acute psychiatric units in Australia and found an overall prevalence of any personality disorder of 18.9%. The authors showed that patients with a diagnosis of personality disorder were overrepresented among both admissions involving reportable aggression (15.2%) and admissions involving less serious aggressive incidents (15.0%). The corresponding odds ratios were 2.7 for reportable aggression and 1.7 for less serious aggression.

While these two studies focused on the risk of violence and offending behaviour in patients with personality disorders during hospitalisation, Gray, Taylor, and Snowden (2011) examined the period after discharge. Based on a sample of 996 male patients discharged from four medium secure psychiatric units, the authors found that diagnoses of personality and substance use disorders were significantly associated with higher rates of violent reconvictions. Overall, 19.4% of former patients were convicted of an offence in the two years following discharge. However, for former patients with a diagnosis of personality disorder (n = 160) the rate was 28.8%. The authors did not distinguish between specific clusters or subtypes of personality disorders but stated that overall dissocial (i.e., antisocial) personality disorder was by far the most common diagnosis (53%), followed by emotionally unstable (borderline) personality disorder (19%). Hence, they suggested that their results were likely to be more representative of those with dissocial (i.e., antisocial) and probably emotionally unstable (i.e., borderline) personality disorders. In line with that, they reported that the majority of former patients had a cluster B diagnosis (77%), followed by cluster A (10%) and cluster C (1%). Additionally, 12% had a personality disorder diagnosis that was not further specified. The authors concluded that, in line with previous research, their findings seem to indicate that, among former psychiatric inpatients, cluster A and B appear to be associated with violent behaviour, while cluster C may be a protective factor.

Based on a combined sample of 276 in- and outpatients (43.0% male, 57.0% female), Hernandez-Avila and colleagues (2000) examined the association between personality disorder diagnoses and criminal behaviour among a group of patients entering a substance abuse treatment programme. Notably, the authors investigated the prevalence of criminal behaviour during the 1-year pretreatment and 1-year posttreatment period. During the pretreatment period, a cluster B diagnosis was significantly associated with overall criminal behaviour (OR = 1.4). Specifically, a diagnosis of antisocial personality disorder was significantly associated with all types of criminal offences (OR = 1.5), including, violent crimes (OR = 1.4), weapon offences (OR = 2.6), crimes against property (OR = 1.7) and drug

offences (OR = 1.5). A diagnosis of borderline personality disorder was also significantly related with violent offending (OR = 1.4), as was a diagnosis of schizoid personality disorder (OR = 1.9). During the posttreatment period, there were distinctly fewer associations between personality disorders and criminal behaviour. Neither cluster B, nor a diagnosis of antisocial personality disorder predicted overall criminal behaviour anymore. Only a diagnosis of borderline personality disorder was still significantly associated with violent offending (OR = 2.7). The authors concluded that patients with borderline personality disorder (and comorbid substance use disorders) may pose a particular challenge for treatment.

However, studying violence and offending behaviour among inpatients only may exaggerate the prevalence among all patients with a diagnosis of personality disorder, as there is a large number of individuals who receives treatment as outpatients. Steadman and colleagues (1998), for instance, investigated the prevalence of violence in a sample of 1,136 outpatients. Despite the fact that there were overall 425 outpatients with a personality disorder diagnosis, only 21 had a primary diagnosis of personality disorder. Hence, the authors combined outpatients with a diagnosis of personality disorder with those having an adjustment disorder and several other cases of "suicidality" and comorbid substance use disorders. They found that among this group of 185 outpatients, 43% reported violent behaviour during the year after discharge. In a reanalysis, Monahan and Applebaum (2000) estimated that among those with specifically a diagnosis of personality disorder, the prevalence of violent behaviour was approximately 25% in the first 20 weeks after discharge.

In another comprehensive study, Posternak and Zimmerman (2002) examined anger and aggression in a sample of 687 outpatients. The authors reported that 206 outpatients had a personality disorder diagnosis, with the majority having a cluster C diagnosis (69.9%), followed by a diagnosis of cluster B (42.2%) and cluster A (21.4%). With regard to anger, outpatients diagnosed with a personality disorder had almost three times the odds of those without personality disorders to report experiencing subjective anger (OR = 2.6) or to overtly express their anger (OR = 2.3). This was particularly true for outpatients diagnosed with a cluster B personality disorder, who had 4.6 times the odds of those without a diagnosis to report experiencing subjective anger and 5.1 times the odds to overtly express their anger. The authors concluded that a diagnosis of cluster B personality disorder independently contributed to the presence of anger and aggression in outpatients.

In another study on the link between personality disorders and aggression, Fossati and colleagues (2007) examined 461 outpatients (36.7% male, 63.3% female) from Italy. The

authors estimated that approximately 66.3% had a diagnosable personality disorder and found that outpatients who had not met diagnostic criteria for a specific personality disorder still showed a substantial number of symptoms. The most frequently diagnosed personality disorders were narcissistic (16.1%), followed by passive-aggressive (15.0%), avoidant (10.6%) and histrionic (10.0%) personality disorders. Notably, only 5.0% of outpatients had a diagnosis of borderline personality disorder and 2.4% had diagnosable antisocial personality disorder. For borderline personality disorder, analyses indicated an association with impulsive traits (i.e., motor impulsiveness), leading the authors to suggest that aggression in outpatients with borderline personality disorder may be a result of poor impulse control. However, in outpatients with antisocial or narcissistic personality disorders, aggression was directly related to disorder traits. Interestingly, the physical aspect of aggression was particularly related to antisocial personality disorder, while the emotional aspects of aggression (i.e., anger) were more strongly associated with narcissistic personality disorder. The authors concluded that their findings supported the hypothesis that individuals with antisocial personality disorder assault others without any emotional involvement (see also Hare, Hart, & Harpur, 1991), while individuals with a diagnosis of narcissism lose control because of low frustration tolerance (see also Baumeister, Bushman, & Campbell, 2000).

In a Danish study, Elkit, Murphy, Jacobsen, and Jensen (2018) examined a sample of 529 outpatients (85.9% male, 14.1% female) who took part in a treatment programme designed to reduce the risk of interpersonal partner violence. More than three fourth (76.0%) of the outpatients had a diagnosable personality disorder, with the majority of outpatients meeting criteria for antisocial (32.3%) and dependent (31.7%) personality disorders, followed by avoidant (24.2%) and borderline (21.7%) personality disorders. Notably, the authors stated that comorbidity was very high in the outpatients. 87.2% of those who met the threshold for any psychiatric disorder also met the threshold for any personality disorder. A diagnosis of personality disorder was significantly associated with an increase in the odds of having anxiety (OR = 4.2), dysthymia (OR = 6.5) or an alcohol abuse disorder (OR = 2.9). With regard to violence, 52.4% of the sample reported to have been engaged in juvenile delinquency, and similarly 51.3% were found to have a criminal record, with overall 59.3% of the outpatients reporting more recent criminal behaviour. However, the authors found that neither involvement in juvenile delinquency, nor adult criminal behaviour or convictions were significantly associated with an increased risk of having a diagnosis of a personality disorder. Despite the fact that none of the associations reached statistical significance, the pattern of results seems to be in line with previous findings. Those with criminal convictions had

approximately twice the odds of those not convicted to have a diagnosis of antisocial (OR = 2.0 ns) or borderline (OR = 1.6 ns) personality disorders, while the odds for having a dependent (OR = 0.8 ns) or avoidant (OR = 0.6 ns) personality disorder were reduced. The same was observed among those who reported criminal behaviour. Those involved in criminal behaviour had twice the odds of those not reporting criminal behaviour to have an antisocial (OR = 2.2 ns) or borderline (OR = 1.7 ns) personality disorder, but were less likely to have a dependent (OR = 0.7 ns) or avoidant (OR = 1.0 ns) personality disorder.

Furthermore, there are a number of studies conducted in secure hospital facilities, which typically provide care and treatment for patients with mental and personality disorders who present a high degree of harm to themselves and/or others. In one such study based on a sample of 36 male patients convicted of sexual offending in the US, McElroy and colleagues (1999) found a very high prevalence of personality disorders. Among the patients, 56% were convicted of having raped or attempted to rape a child and 28% had a conviction for having raped or attempted to rape and adult. The prevalence of nonsexual crime was also very high (overall 92%), with 75% of patients reporting offences including theft, burglary, and robbery, 44% reporting assault and 22% involvement in the destruction of property. With regard to personality disorders, the authors found that 94% of patients met diagnostic criteria for at least one personality disorder and one third (33%) met criteria for three or more. The most common category of personality disorders was cluster B with a prevalence of 92%, followed by cluster C with a prevalence of 36% and cluster A with a prevalence of 28%. Of those with a cluster B personality disorder, 72% met diagnostic criteria for antisocial personality disorder, followed by 42% for borderline, 17% for narcissistic and 6% for histrionic personality disorders. In line with previous research the authors reported very high rates of comorbidity. 97% of patients met diagnostic criteria for another mental disorder with 83% of patients having a lifetime diagnosis of substance use disorders, 61% meeting diagnostic criteria for a mood disorders (36% bipolar disorder), and 36% for an anxiety disorder. Overall, the authors concluded that there was an extremely high prevalence of personality disorders among patients convicted of sexual offending.

In a follow-up study, Dunsieth and colleagues (2004) studied 113 male sexual offenders who received treatment in the same facility. The authors reported that 87% of patients met diagnostic criteria for at least one personality disorder and 28% met criteria for three or more personality disorders. In line with their previous findings, cluster B diagnoses were most prevalent with 56% of patients meeting diagnostic criteria for antisocial personality disorder, followed by 28% with borderline and 25% with narcissistic personality disorders.

Similarly, they found again very high rates of comorbidity with 85% of patients having a lifetime diagnosis of substance use disorders and 58% meeting diagnostic criteria for a mood disorder.

Another well-known study by Coid, Kahtan, Gault, and Jarman (1999) investigated a sample of 511 patients with a diagnosis of personality disorder admitted to secure forensic psychiatric services in England and Wales. In terms of criminal charges leading to admission, 23% of patients were admitted for attempted murder or wounding, 15% for committing bodily harm, unlawful weapon use or threating behaviour and 15% for homicide. Among patients with personality disorders, a cluster B diagnosis was the most prevalent with 44% meeting diagnostic criteria for antisocial and 35% meeting criteria for borderline personality disorders. Notably, those with antisocial personality disorder had almost three times the odds of those without the diagnosis to have previous convictions for both major (OR = 2.6) and minor (OR = 2.9) violence, for sexual offences (OR = 2.8), criminal damage (OR = 2.5), robbery (OR = 3.4) and drug-related offences (OR = 2.9) and were overall more likely to have spent time in young offenders' institutions (OR = 1.6) and prisons (OR = 1.14).

In a German study, Leue, Borchard, and Hoyer (2004) examined a sample of 55 male sexual offenders, of which 55% were diagnosed with paraphiliacs and 45% had an impulse control disorder. Among the patients, 93% met diagnostic criteria for at least one mental or personality disorder before committing their crime. The authors found that cluster B personality disorders were most prevalent with 47% of males with paraphiliacs and 40% of those with an impulse control disorder meeting diagnostic criteria. Among those with a cluster B diagnosis, the most prevalent disorder was antisocial personality disorder (35%), followed by avoidant (24%) and borderline personality (15%) disorders.

Finally, in another comprehensive UK study, Jamieson and Taylor (2004) followed up a sample of 204 patients over a period of 12 years after discharge from a high security psychiatric hospital. The authors reported that 38% of the sample was reconvicted during the follow-up period, with 26% of former patients being convicted for serious offences. Notably, when compared with patients with mental disorders, those with personality disorders[11] were significantly more likely to be reconvicted. Overall, former patients with a diagnosis of personality disorder had seven times the odds (OR = 7.0) of those with a mental disorder only to be reconvicted of a serious offence after discharge from a high security psychiatric hospital.

[11] Conceptualised as psychopathic disorder.

In summary, clinical evidence indicates that patients with a diagnosis of personality disorder are at greater risk of offending and violent behaviour. In particular cluster B personality disorders were shown to be overrepresented in clinical samples of patients with criminal histories and among those involved in violent incidents. Antisocial and borderline personality disorders were very common in the clinical context and research has demonstrated a high co-occurrence between them, specifically in samples from facilities with higher levels of secure care. Overall, research has suggested that violence and offending behaviour is associated with antisocial and borderline personality disorders. Some studies have also found associations with narcissistic personality disorder, which in contrast to antisocial personality disorder seems to be more related to the emotional aspects of aggression than to the physical aspects. With regard to the role of cluster A and cluster C personality disorders, a few studies have reported associations between offending behaviour and cluster A diagnoses (e.g., schizoid personality disorder), while cluster C diagnoses (e.g., avoidant and dependent personality disorders) have often been shown to exhibit a protective effect within the clinical context. Finally, research has consistently reported very high rates of comorbidity in personality disorders, within and between clusters, but also with other psychiatric disorders, including mood and anxiety disorders, as well as substance dependence. Overall, comorbidity has been shown to enhance the risk of violence and offending behaviour in patients with certain personality disorders.

Prison setting. A number of studies has investigated the prevalence of personality disorders among people in contact with the criminal justice system. Overall, personality disorders seem very common among incarcerated offenders and have consistently been shown to exceed rates of such disorders in the general population. However, the prevalence of personality disorders among prisoners varies substantially by gender (i.e., male versus female), type of sample (i.e., sentenced versus remanded prisoners) and other characteristics (e.g., offence category). Most published research on the association between personality disorders and offending behaviour focuses on cluster B and there is only very limited information on the prevalence of cluster A or cluster C diagnoses in offender samples. Specifically, the majority of studies has restricted their measure of personality disorder to either a global diagnosis or has exclusively focused on antisocial personality disorder.

In a comprehensive review on the prevalence of personality disorders in prisoners, which included 28 publications and about 13,844 prisoners (78% male, 12% female), Fazel and Danesh (2002) estimated a pooled prevalence of 40% to 70% for any personality disorder with approximately 65% of male and 42% of female offenders meeting diagnostic criteria.

The authors reported that the most prevalent diagnosis was antisocial personality disorder, affecting approximately 47% of male and 21% of female prisoners. These findings indicate that approximately one in two male and one in five female prisoners has a diagnosis of antisocial personality disorder. The authors concluded that compared to the general population, people in prison have a ten-fold increased risk of having a diagnosable antisocial personality disorder.

In a large-scale study among prisoners in England and Wales, Singleton, Meltzer, Gatward, Coid, and Deasy (1998) investigated psychiatric morbidity in a sample of 3,142 incarcerated offenders. The authors found that the prevalence of any personality disorder was 50% for female prisoners and 78% for male remand and 64% for male sentenced prisoners. Antisocial personality disorder was the most common diagnosis, with 31% of female prisoners, 63% of male remand and 49% of male sentenced prisoners having an antisocial personality disorder. Paranoid personality disorder was the second most prevalent disorder with 16% of female prisoners, 29% of male remand and 20% of male sentenced prisoners meeting diagnostic criteria for paranoid personality disorder. The third most prevalent disorder was a diagnosis of borderline personality disorder. Notably, among female prisoners, a diagnosis of borderline personality disorder was more common than a diagnosis of paranoid personality disorder. Borderline personality disorder was diagnosed in 20% of female prisoners, 23% of male remand and 14% of male sentenced prisoners. Overall, Singleton and colleagues (1998) found that rates were higher in remand compared to sentenced prisoners and among male compared to female prisoners.

In a more in-depth analysis with focus on specific personality disorders, Coid (2002) investigated a sample of 81 male prisoners who all had a diagnosis of personality disorder. In line with Fazel and Danesh' (2002) review, Coid (2002) found that the most prevalent diagnosis was antisocial personality disorder, with 84% of prisoners meeting diagnostic criteria. The second most common diagnosis was paranoid personality disorder (67%) followed by narcissistic (63%), borderline (56%), histrionic (43%), schizotypal (27%), avoidant (21%), dependent (14%) and schizoid (11%) personality disorders. With regard to violence, the author reported that prisoners with paranoid personality disorder had more than six times the odds (OR = 6.4) of those without the diagnosis to behave violently towards other inmates. Prisoners with narcissistic personality disorder had nearly three times the odds (OR = 2.8) of those without the diagnosis to be violent towards staff and other inmates. Borderline personality disorder was associated with violence against other prisoners (OR = 6.4) and hostage taking (OR = 4.1), which was also found to be associated with homicidal compulsive

urges in a small subgroup of prisoners with borderline personality disorder. Findings of this study suggest that personality disorders, and in particular a diagnosis of antisocial, paranoid, narcissistic or borderline personality disorder, are significantly associated with violence. However, it should be noted that this study focused on violent behaviour during imprisonment and not on those individuals' offending behaviour in the community.

In a thorough investigation of more specific offence categories, Roberts and Coid (2010) examined personality disorder clusters in a representative sample of 496 prisoners (83.4% male, 22.4% female). For cluster B disorders, the authors found that conduct and antisocial personality disorders demonstrated the strongest associations with criminal behaviour. Conduct disorder was significantly related to all offence categories and adult antisocial personality disorder was associated with most offence categories, including robbery, theft, burglary, firearm offences and violence. Narcissistic personality disorder was associated with fraud and drug offences. Notably, the authors did not find any associations between borderline personality disorder and offending behaviour, despite the high rates of borderline personality disorder found in prisoners, especially in females. They suggested that this might be due to the high rates of comorbidity between borderline and antisocial personality disorders and hypothesised that any associations may have been lost after controlling for confounding factors. For cluster C disorders, they reported that avoidant personality disorder was positively associated with criminal damage and negatively associated with firearm offences. Obsessive-compulsive personality disorder was associated with firearm offences and dependent personality disorder significantly associated with firearm offences and violence. For cluster A disorders, the authors found that paranoid personality disorder was positively associated with robbery and negatively associated with driving offences. Schizotypal personality disorder was significantly associated with arson and negatively associated with robbery and blackmail. Schizoid personality disorder was associated with kidnap, burglary, and theft. Notably, sex offences and homicide were not associated with any personality disorders. Overall, the authors concluded that antisocial personality disorder accounts for most of the relationship between offending and personality disorders.

In a large-scale Australian case-linkage study with 4,156 individuals (92.3% males, 7.7% female), Wallace and colleagues (1998) found that a diagnosis of personality disorder was the psychiatric condition most strongly associated with convictions for all types of offences. Only the effect of substance use disorders was equally critically in this sample. For male offenders, the authors reported robust and significant associations between convictions for offences involving interpersonal violence (OR = 18.7), homicide (OR = 28.7), arson (OR

= 13.4), drugs (OR = 7.3), damage of property (OR = 10.2), sexual offending (OR = 14.7) and prior treatment for personality disorder. For female offenders, they found robust and significant associations between convictions for offences involving interpersonal violence (OR = 49.6) and property damage (OR = 27.2) and prior treatment for personality disorder. Wallace and colleagues (1998) concluded that offenders with a diagnosis of any personality disorder were at a significantly greater risk of violent and offending behaviour. They stated that among prisoners it is not individuals with schizophrenia or more severe affective disorders who are responsible for the vast majority of offending, but those with severe personality and substance use disorders.

In another Australian study, Butler and colleagues (2006) compared psychiatric morbidity in a sample of 916 prisoners (82.1% male, 17.9%) with 8,168 individuals (48.5% male, 51.5% female) from the community. The authors found a much higher rate of personality disorders in the prison sample (43.1%) than in the community sample (9.2%). This was also true for each of the personality disorder clusters, which showed only little difference in the proportion of individuals experiencing either a cluster A, cluster B or cluster C personality disorder. Compared to individuals from the community, prisoners had 14.1 times the odds to have a diagnosis of a cluster B personality disorder (30.9% versus 3.8%), 10.4 times the odds to have a cluster A personality disorder (27.3% versus 4.1%) and 7.3 times odds to be diagnosed with a cluster C personality disorder (28.6% versus 5.6%).

A few studies on personality disorders in prisoners have focused on distinct subgroups of incarcerated offenders. Fazel, Hope, O'Donnell, and Jacoby (2002), for instance, have investigated a sample of 101 imprisoned elderly male sexual offenders and compared them to 102 imprisoned elderly male non-sexual offenders. Among prisoners convicted of sexual offences the prevalence of any personality disorder was 33% compared with 28% among those prisoners convicted of non-sexual offences. The authors noted that the prevalence of any personality disorder did not differ significantly between the two groups. However, they found that personality traits between the two groups differed significantly. While the most common personality disorder among non-sexual offenders was antisocial personality disorder with a prevalence of 12%, those with convictions of sexual offences had more schizoid (10%), obsessive-compulsive (10%) and avoidant traits (11%) and a relatively low prevalence of antisocial personality disorder (5%). The authors concluded that a diagnosis of personality disorder other than antisocial personality disorder was more relevant in sexual offending.

In a study on personality disorders among offenders convicted of homicide, Shaw and colleagues (2006) investigated a sample of 1,594 offenders (90% male, 10% female) and reported that 9% had a lifetime diagnosis of personality disorder. In fact, they found that the most common diagnosis among homicide offender were not mental disorders but personality disorders, followed by substance use disorders. Similarly, in another study of homicide offenders, Eronen, Hakola and Tiihonen (1996) examined a sample of 693 prisoners and found that 34.4% of male and 35.7% of female homicide offenders had a personality disorder with 11.3% of males and 13.1% of females meeting diagnostic criteria for antisocial personality disorder. Notably, 39.2% of male and 32.1% of female homicide offenders reported alcohol abuse, leading the authors to estimate that antisocial personality disorder or alcohol abuse disorder increased the odds of a male to commit a homicide by over 10-fold. For female offenders, numbers were even higher, but results must be interpreted with caution as there are only very few female homicide offenders.

In terms of comorbidity, Hodgins, De Brito, Chhabra, and Côté (2010) made an interesting observation in their study regarding comorbid antisocial personality and anxiety disorders. The authors investigated a sample of 279 male prisoners with antisocial personality disorder and found that two-thirds of incarcerated offenders also met criteria for an anxiety disorder. When comparing offenders with comorbid antisocial personality and anxiety disorders to those with personality disorders only, Hodgins and colleagues (2010) found that those with additional symptoms of anxiety had started offending at an earlier age, showed more antisocial personality disorder symptoms, were more likely to also have a substance use disorders and to have committed more serious acts of violence. The authors suggested that incarcerated offenders with comorbid anxiety disorders may be a distinct subgroup that requires specific interventions. However, another explanation for their observation could also be that anxiety may rather be the outcome of more serious and persistent offending. However, Copeland and colleagues (2007) came to a similar conclusion. The authors followed 1,420 children into late adolescence and reported that the presence of comorbid conduct personality and anxiety disorders (1.2%) increased the risk of violent criminal offending to a much greater extent than, for instance, comorbid conduct personality disorder and substance misuse (1.9%) did. The odds ratios for those with comorbid conduct and anxiety disorders were 2.3 for minor offences, 2.6 for moderate offences and 7.1 for severe and violent offences, while those for children with comorbid conduct personality and substance use disorders were 1.8 for minor offences, 2.0 for moderate offences and 5.8 for severe and violent offences.

In a recent study from New Zealand, Indig, Gear, and Wilhelm (2016) examined mental health problems among 1,209 prisoners and compared them to rates in the general population. The authors reported that 32.9% of prisoners met diagnostic criteria for a personality disorder, with male prisoners having a higher prevalence of all personality disorders than female prisoners (except for schizoid personality disorder). The most prevalent diagnoses were paranoid (15%), antisocial (11%), obsessive-compulsive (11%) and borderline (10%) personality disorder. Notably, the authors reported that the prevalence of personality disorders was higher among prisoners with lifetime diagnoses of anxiety (42%) or mood (46%) disorders compared to 34% among those with substance use disorder and 19% among without psychiatric disorders. Similarly, in an evaluation study of the needs for psychiatric treatment in prisoners in the UK, Bebbington and colleagues (2017) interviewed a representative sample of 368 prisoners (53.5% male, 46.5% female) and found, overall, a very high prevalence of personality disorders. In total, 34.2% of prisoners met criteria for some form of personality disorder. Borderline and antisocial personality disorder were the most common categories, with a higher prevalence of borderline personality disorder in female prisoners (20.0% versus 18.1%) and a higher prevalence of antisocial personality disorder in male prisoners (31.4% versus 55.2%). Notably, the authors stated that in this sample of prisoners, borderline personality disorder was 33-times and antisocial personality disorder 73-times more frequent than in the general population. With regard to other personality disorders, the authors reported that avoidant personality disorder was the only other relatively common category, particularly in female prisoners and that paranoid personality disorder was less frequent with only 1% of male and 2% of female prisoners meeting diagnostic criteria. Overall, Bebbington and colleagues (2017) found a slightly higher prevalence of personality disorders in remand prisoners (39.1%) than in sentenced prisoners (29.9%), however this difference was not statistically significant.

In an update of Bebbington and colleagues' (2017) evaluation study on the mental health needs of prisoners in the UK, Tyler and colleagues (2019) examined 469 prisoners (72.1% male, 27.9% female) and found that over half of all prisoners met diagnostic criteria for a personality disorder (54.8%). The most prevalent personality disorders were depressive[12] (28.1%), masochistic[13] (22.4%) and schizoid (21.3%) personality disorders, followed by

[12] Depressive personality disorder is no longer listed as an official personality disorder. However, the diagnosis is still included under the DSM-5 section "unspecified disorder" (APA, 2013).

[13] Masochistic personality disorder has never been formally admitted into the diagnostic manuals. It is described as a disorder that shows a pervasive pattern of self-defeating behaviours and has sparked a lot of controversy

borderline (20.5%), paranoid (19.4%), antisocial (19.0%) and avoidant (19.0%) personality disorders. The authors reported that prevalence rates were significantly higher among female than male prisoners (68.7% versus 49.4%). Among male prisoners, the most common diagnoses were depressive (26.3%), schizoid (19.8%) and antisocial (19.2%) personality disorders. Among female prisoners, masochistic (44.3%), depressive (32.8%) and borderline (29.0%) personality disorders were the most prevalent diagnoses.

In summary, research indicates that the risk of having a personality disorder is substantially higher in incarcerated offenders. Studies have estimated that, while they affect between 4% to 11% of the general population (e.g., Winsper et al., 2019), their prevalence in the criminal justice system is much higher with approximately 60% to 70% of prisoners (see e.g., Fazel & Danesh, 2002 for a review) and around 50% of offenders supervised by probation in the community (e.g., Centre for Mental Health, 2012) meeting diagnostic criteria for a personality disorder. Across all studies cluster B diagnoses, specifically antisocial, borderline, and narcissistic personality disorders were overrepresented in offender populations. In addition, a number of studies has demonstrated a high prevalence of cluster A paranoid personality disorder. High rates of borderline and paranoid personality disorders seem particularly prevalent in female prisoners, while antisocial personality disorder has been shown to be more common in male prisoners. Overall, there are very high rates of comorbidity in personality disorders, within and between clusters, but also with other psychiatric conditions, including psychosis, mood, and anxiety disorders. In addition, co-occurring substance use and personality disorders have been found to be highly prevalent in offender populations and this comorbidity has been shown to enhance the risk of violence and offending behaviour. Although antisocial personality disorder seems to account for most of the relationship between offending behaviour and personality disorders, research suggests that paranoid, borderline and narcissistic personality disorders may also be significantly related to violence and offending behaviour. It should be note, however, that research presented in this review suggests that incarcerated offenders are at *higher risk* of having a personality disorder,

(see e.g., Fuller, 1986). The debate was based on mainly two arguments; on the one hand, critics reasoned that there was not enough scientific evidence to support the existence of such a disorder and on the other hand, they feared that it would be biased against women in the context of, for instance, intimate partner violence and encourage victim blaming. As of today, masochistic personality patterns are rather understood as features of socialised behaviours that strongly emphasise nurturance and selflessness (see also Baumeister, & Scher, 1988; Walker, 1987).

findings do not infer causality, in the sense that offenders with a diagnosis of a personality disorder inevitably present a danger to society. In fact, Coid and colleagues (2006a, 2006b) estimated in their studies that only 11% of those with a diagnosis of personality disorder reported violent behaviour over the past five years compared with 7% of the population (see below).

Community setting. Prevalence rates of personality disorders are infrequently carried out in community-based studies on the association between mental health problems and offending behaviour. However, in a recent comprehensive review on the global prevalence of personality disorders in the community, which included 46 studies from 21 countries, Winsper and colleagues (2019) estimated that approximately 7.8% of the general population have at least one personality disorder, with larger rates in high income compared with low- and middle-income countries (9.6% versus 4.3%). The rates for cluster A, B, and C personality disorders were 3.8%, 2.8% and 5.0%, respectively. Notably, the authors reported that prevalence rates for cluster A and C personality disorders exceeded cluster B personality disorders (see also Bateman, Gunderson, & Mulder, 2015).

With regard to violence and offending behaviour, there is only little research based on community samples. In one large-scale study, Johnson and colleagues (2000) investigated whether personality disorders during adolescence were associated with an elevated risk for violent behaviour during adolescence and early adulthood. The authors interviewed 717 individuals (49% male, 51% female) from a community sample in New York and estimated that 14.4% met diagnostic criteria for a personality disorder, with half of them having a single diagnosis and the other half having two or more diagnoses. Among those with at least one personality disorder, the prevalence of violent behaviour was 38% in contrast to 19% among those without a diagnosable personality disorder. With regard to specific personality disorder clusters, they found that 7% had a cluster B personality disorder (not including antisocial personality disorder), 6% met diagnostic criteria for a cluster A personality disorder and 5% had a cluster C personality disorder. Those with a cluster B diagnosis had five times (OR = 4.6) the odds of those without the diagnosis to initiate physical fights, more than seven times (OR = 7.3) the odds to commit robbery and four times (OR = 4.2) the odds to engage in violent behaviour. Those with a cluster A diagnosis had more than five times (OR = 5.4) the odds of those without the diagnosis to assault others and five times (OR = 5.0) the odds to commit robbery. Notably, cluster C personality disorders were not significantly associated with an increased risk of violence. With regard to specific personality disorders, the authors reported that in particular paranoid, narcissistic and borderline personality disorders during

adolescence were independently associated with the risk for violence and criminal behaviour during adolescence and early adulthood, even after controlling for a number of covariates. It should be noted that antisocial personality disorder was not assessed for the whole sample due to the young age of the study participants. With regard to this, the authors state that their findings may underestimate the association between cluster B personality disorders and offending behaviour.

In another large-scale study, Coid, Yang, Tyrer, Roberts, and Ullrich (2006), investigated the relationship between violence and personality disorders over a five-year period in a representative household sample of 8,397 individuals (49.8% male, 50.9% female). They found that 4.4% of the population met diagnostic criteria for at least one personality disorder, with overall personality disorders being more prevalent in males than in females (5.4% versus 3.4%). Only schizotypal personality disorder was more prevalent in females. The mean number of personality disorder diagnoses was 1.9, with 53.5% of individuals having one personality disorder only, 21.6% having two, 11.4% having three and 14.0% having between four and eight diagnoses. Diagnoses of cluster C personality disorders were most common (2.6%), followed by cluster A (1.6%) and cluster B (1.2%). Those with cluster B personality disorders were found to have significantly higher odds of being convicted of a criminal offence (OR = 10.2) or of having spent time in prison (OR = 7.6). Cluster A and C personality disorders were not associated with an increase in violence risk. In an in-depth analysis of the relationship between personality disorders and violent behaviour, Coid and colleagues (2006b) found that only 11% of those with a diagnosis of any personality disorder reported violent behaviour in the last five years, in contrast to 7% of those without any psychiatric diagnoses (OR = 1.8). They reported that of all psychiatric conditions assessed in their study, antisocial personality disorder was most strongly associated with violent behaviour. Results of their weighted logistic regression analysis revealed an odds ratio of 6.1 for individuals with antisocial personality disorder to report violent acts within the last five years. With regard to the population attributable risk the authors estimated that almost half (46.8%) of all violent incidents could be explained by hazardous drinking, followed by drug misuse which accounted for 36.8% and personality disorders with 26.4%.

In a systematic review on the risk of antisocial behaviour in individuals with personality disorders, which included 14 studies and 10,007 individuals diagnosed with a personality disorder, Yu, Geddes, and Fazel (2012) found that 13.6% were involved in antisocial behaviour, in contrast to 3.5% of the 12,742,916 individuals without diagnosable personality disorder. In studies with violent behaviour outcomes, there were in total 9,578

individuals with at least one personality disorder, of whom 10.7% reported violent behaviour. These were compared with 327,293 individuals without diagnosable personality disorder, of whom 1.2% were violent. The authors estimated that there was a threefold increase (OR = 3.0) in the odds of violence in individuals with personality disorders. For studies that assessed both violence and antisocial behaviour outcomes, the authors reported an overall pooled odds ratio of 6.2 for individuals with a diagnosis of personality disorder. Notably, the risk of violence was substantially higher for individuals with a diagnosis of antisocial personality disorder. The authors estimated an odds ratio of 12.8 for individuals with antisocial personality disorder to report violent behaviour. Specifically, the odds ratio was 13.1 in females and 7.9 in males, indicating an overall higher risk of violent behaviour in females with antisocial personality disorder. The overall population attributable risk fraction for personality disorders on violence was estimated to be 18.8% based on studies included in Yu, Geddes, and Fazel's (2012) review.

A number of community-based studies has specifically focused on antisocial personality disorder and investigated its relationship with violent and offending behaviour. For instance, in a large-scale Danish birth cohort study, Hodgins, Mednick, Brennan, Schulsinger, and Engberg (1996) examined 324,401 individuals (51% male, 49% female) in the community and found that 1.% of males and 2.2% of females met diagnostic criteria for an antisocial personality disorder. With regard to criminal convictions, the authors reported that among males, 6.1% of never-treated individuals had a criminal record compared with 32.4% of those with a diagnosis of antisocial personality disorder. Among females, 2.1% of never-treated individuals had at least one conviction compared with 13.6% of those with a diagnosis of antisocial personality disorder. The authors concluded that an antisocial personality disorder was associated with an increased risk of arrest.

Likewise, in an Israeli study, Stueve and Link (1997) interviewed 2,678 individuals from a community sample, of which 49 individuals met diagnostic criteria for antisocial personality disorder. Among those without any diagnosable antisocial personality disorder, 8.0% reported recent fighting in contrast to 51.6% individuals with diagnosable antisocial personality disorder. The corresponding numbers for recent weapon use were 1.0% among individuals without the diagnosis and 20.2% among individuals with diagnosable antisocial personality disorder. The authors concluded that individuals with antisocial personality disorder were substantially more likely than those without a diagnosable antisocial personality disorder to report recent violent behaviour.

Finally, in a representative population-based cohort study with 2,712 males, Elonheimo and colleagues (2007) investigated the relationship between psychiatric disorders and police-registered offences. The authors reported that 73 males met diagnostic criteria for antisocial personality disorder. Of those males, 61.6% reported criminal behaviour in contrast to only 19% of males without any psychiatric disorders (OR = 5.3). Males with antisocial personality disorder had 8.3 times the odds of males without any disorders to commit drug offences, 3.3 times the odds to be involved in property offences and 2.2 times the odds to commit a traffic offence. Notably, the rate of violent offending was only slightly increased in individuals with antisocial personality disorder and not statistically significant (OR = 1.5 ns).

In summary, community-based studies on the association between personality disorders and offending behaviour have shown that individuals with certain personality disorder diagnoses are at significantly greater risk of violence and offending behaviour. Generally, a diagnosis of a cluster B, rather than cluster A or C personality disorder, was found to be more strongly associated with violence and criminal behaviour. Specifically, individuals with a cluster B personality disorder were estimated to have a tenfold increase in risk for a criminal conviction and an eightfold increase in risk for receiving a prison sentence (Coid, Yang, Tyrer, Roberts, & Ullrich, 2006). Particularly individuals with antisocial personality disorder have been shown to have almost a 13-fold increase in risk for violent behaviour (Yu, Geddes, & Fazel, 2012). Of all personality disorders criminal behaviour is most strongly predicted by a diagnosis of antisocial personality disorder among individuals in the community. However, associations have also been found between narcissistic and borderline personality disorders and cluster A paranoid personality disorder. Finally, community-based studies have reported high comorbidity of personality disorders, with approximately 50% of those meeting diagnostic criteria for one personality disorder, also meeting criteria for another (Coid, Yang, Tyrer, Roberts, & Ullrich, 2006).

Conclusion. Research has shown that rates of personality disorders are higher in prisoners, in violent psychiatric patients and in individuals who commit criminal offences in the community. Personality disorders are estimated to exist in about 5% to 10% of the general population, in about 30% to 40% of psychiatric patients and in more than 50% of incarcerated offenders (see also NOMS, 2015). However, even though there seems to be a link between personality disorders and offending behaviour, the relationship is not straightforward and varies by personality disorder diagnosis and patterns of comorbidity.

Overall, prevalence rates of offending behaviour have been found to be higher among individuals with cluster B personality disorders and specifically antisocial and/or borderline personality disorders. The link between offending behaviour and antisocial personality disorder may be unsurprising given the rather tautological definition as antisocial personality disorder includes diagnostic symptoms like a "gross disparity between behaviour and the prevailing social norms" and is characterised by "a low threshold for discharge of aggression, including violence" (ICD-10, WHO, 1992) or the "failure to conform to social norms concerning lawful behaviours, such as performing acts that are grounds for arrest" (DSM-5, APA, 2013).

Further, antisocial and borderline personality disorder comorbidity has been found to be very common in correctional and clinical samples and has been estimated to be strongly associated with higher rates of violence and criminal behaviour (Howard, Huband, Duggan, & Mannion, 2008). Overall few studies have linked other personality disorders to offending. Some found associations between schizoid and paranoid personality disorders and elevated levels of violence and offending behaviour. Further, narcissistic personality disorder has been linked to violence in the context of threatened egotism, which is experienced by a subgroup of people who show inflated or grandiose views of self and low levels of empathy (see also Baumeister, Bushman, & Campbell, 2000).

In summary, it can be said that despite methodological differences with regard to sample population (i.e., psychiatric patients, incarcerated offenders, community residents), study design (i.e., cross-sectional, longitudinal) and assessment of offending behaviour (i.e., self-reports, official records), research indicates that there is a relatively robust association between specific personality disorder diagnoses and offending behaviour. However, the precise nature of the relationship is less clear and further complicated by high rates of comorbidity found in studies on personality disorders.

Finally, it is important to reassert the fact that most people with a diagnosis of personality disorder do not come into contact with the criminal justice system and that a more comprehensive understanding of the relationship is needed in order to not hastily and inaccurately link concepts of risk to people with personality disorders and label them as dangerous solely based on a personality disorder diagnosis.

4.5 Perceptions and Evidence

In public perception, mental disorders and offending behaviour are often seen as inextricably linked. This perception is further augmented by the media's tendency to sensationalise violence in the context of mental disorders. A diagnosis of mental disorder has been referred to as the "ultimate stigma" (Falk, 2001) and Goffman (1963) once stated that people with mental disorders start out with rights and relationships, but end up with little of either. It is reasonable to assume that the stigma associated with criminal behaviour is equally debilitating (e.g., Becker, 1963; Maruna, 2001; Nee, & Witt, 2013). Public perception of the combination of these two factors may have serious consequences for individuals with internalising and/or externalising behaviour problems, including discrimination, social isolation, increased engagement in emotional numbing and reluctance to seek help.

This chapter set out to provide an overview of public perceptions and current empirical research on the association between mental disorders and criminal behaviour, which constitutes the foundation for an attempt to further advance knowledge and understanding, specifically with regard to the question as to whether mental disorders and offending behaviour are interrelated or just coincidental phenomena. Mental disorder and criminal behaviour are both aggregate terms that encompass many different individual experiences and as such there is no easy answer to the question of what the precise nature of their relationship is. Taken together, some studies have found a clear relationship between specific mental disorders and certain types of offending behaviour, and others have found that after controlling for demographic factors, history of psychiatric treatment and arrest or comorbid substance use disorders, the association disappears. The relationship is not straightforward and varies by type of mental disorder, type of offending behaviour, by comorbidity patterns and other factors.

It is widely recognised that mental health problems are highly prevalent in the general population. A review of European studies on the prevalence of psychiatric disorders estimated that about 27% of the general population was affected by at least one mental disorder in the past 12 months, with mood, anxiety and substance use disorders being the most common conditions (Wittchen & Jacobi, 2005; see also Bridges, 2014). The prevalence of violence committed by individuals with these mental disorders is typically shown to be very low in community samples, with an estimated population-attributable risk fraction of approximately 5% (e.g., Appelbaum, 2006; Fazel & Grann, 2006; Swanson, McGinty, Fazel, & Mays, 2015).

Overall, this indicates that “the large majority of people with mental disorders do not engage in violence against others” (Swanson, McGinty, Fazel, & Mays, 2015, p. 375).

Among psychiatric patients, violence and offending behaviour seems to be a more common and complex issue. It has been estimated that approximately 17% of inpatients commit at least one act of violence during their hospitalisation (see e.g., Lozzino, Ferrari, Large, Nielssen, & Girolamo, 2015 for a review). However, it has been shown that rates of violence among patients typically peak at time of their admission to the clinic and only remain high for a short period after discharge when, for instance, some patients still experience active psychiatric symptoms (Steadman et al., 1998). While findings indicate that specific mental disorders (e.g., schizophrenia, bipolar disorder) may be associated with an increased risk of violence in some individuals, it is estimated that only a small portion of the violence committed in the community can be ascribed to mental health patients (Mulvey, 1994).

Among incarcerated offenders, mental health problems seem to be extremely common. It is estimated that the prevalence of mental disorders in offender populations is almost three times that of the general population (Teplin, 1990a) and more recently the Bradley Report (Bradley, 2009) stated that over 90% of prisoners have one or more psychiatric disorders. The most common diagnoses are substance use disorder and certain personality disorders. Further, it has been estimated that approximately one in seven prisoners has a diagnosis of psychosis or depression, with 25% of female prisoners and 15% of male prisoners meeting diagnostic criteria in contrast to only 4% in the general population (Fazel & Seewald, 2012).

However, people with mental health problems are not a homogenous group. Psychiatric disorders, that have been linked to antisocial, violent, or offending behaviour are wide-ranging and can include psychotic disorders like schizophrenia, certain affective disorders, cluster B personality disorders and anxiety disorders like posttraumatic stress disorder. These different types of mental health problems show different strengths of association to violence and offending behaviour.

Schizophrenia is a relatively severe condition that is associated with more frequent mental health service contacts. It is particularly prevalent in clinical settings and, compared to the general population, also relatively common among incarcerated offenders. Overall, research suggests that there is a modest association between schizophrenia and violent behaviour. However, not all symptoms of schizophrenia seem to be predictive of violence. Particularly, positive symptoms and specifically the experience of command delusions seem

to be a key factor in the explanation of the relationship between violence and acute psychosis (e.g., Coid et al., 2013). It is suggested that delusions of extreme personal threat (typically due to some kind of misinterpretation) constitute the main drive in more serious violent behaviour among individuals with schizophrenia (e.g., Arseneault, Moffitt, Caspi, Taylor, & Silva, 2000; but see Appelbaum, Robbins, & Monahan, 2000).

Mood and anxiety disorders are the most commonly occurring mental health conditions in the general population. Their prevalence is also relatively high in clinical settings and particularly high in prison populations. While research suggests that depressive symptoms and anxiety disorders are rarely predictive of violent or offending behaviour (see Section 4.4.2 and Section 4.4.3), some forms of depression, including psychotic depression or current mood episodes (i.e., mixed manic and depressive states) in bipolar disorder have been linked to an increased risk of violence (e.g., Binder, & McNiel, 1988; Ahonen, 2019). Overall, it has been suggested that anxiety and depression are more likely to be outcomes of offending and its consequences than one of its causes (Jolliffe et al., 2019; see also Defoe, Farrington, & Loeber, 2013).

Personality disorders are severe mental health conditions that affect how people think, feel and behave. They are estimated to exist in about 5% to 10% of the general population, in about 30% to 40% of psychiatric patients and in more than 50% of incarcerated offenders. The most prevalent diagnoses in both clinical and correctional settings are antisocial and borderline personality disorders (see e.g., Sansone, & Sansone, 2009; Yu, Geddes, & Fazel, 2012 for reviews). These two diagnoses have a high rate of co-occurrence and have been found to be strongly related to violent behaviour (Howard, Huband, Duggan, & Mannion, 2008). Findings indicate that, when considering all major mental disorders, the risk of violence and offending behaviour seems particularly elevated in those with cluster B personality and/or substance use disorders.

Finally, substance use disorders were found to be highly common in all settings. However, rates were greatly increased in prisoners, with approximately one in four (24%) prisoners having an alcohol use disorder and almost one in three (30%) having a drug use disorder (Fazel, Yoon, & Hayes, 2017). Similar rates were found in psychiatric patients with approximately one in five (21%) having a lifetime diagnosis of an alcohol use disorder (Koskinen, Löhönen, Koponen, Isohanni, & Miettunen, 2009). Several studies have demonstrated that substance use disorders are a common comorbidity to other mental disorders and exacerbate the risk of offending markedly (Elbogen, & Johnson, 2009; Fazel,

Långström, Hjern, Grann, & Lichtenstein, 2009; Grann, & Fazel, 2004; Modestin, & Wuermle, 2005; Räsänen et al., 1998). However, to date, the precise nature of the interrelations between specific mental health problems, offending behaviour and substance use disorders is not clear. In fact, it has been shown that, independent of an individual's mental health problems, chronic substance use disorders by themselves are a criminogenic factor (e.g., Boden, Fergusson, & Horwood, 2012; Soyka, 2000) and likely to be associated with both mental health problems and offending behaviour (see e.g., Pickard & Fazel, 2013 for a review).

Taken together, research indicates that the relationship between mental disorders and offending behaviour appears to be overemphasised, however, violence, criminality and mental disorders are not without connection. Over the past decades, research has gathered a lot of information and built a wide knowledge base. Previous studies have contributed considerably to a better understanding of the complex interrelations between mental disorders and offending behaviour. However, the literature on the association is still inconclusive for several reasons.

For many years, empirical evidence of the association between mental disorders and crime has derived largely from clinical and correctional studies that examined violence and offending behaviour among hospitalised psychiatric patients or mental health problems among incarcerated offenders. There is no doubt that studies based on institutionalised individuals are extremely valuable in order to determine whether hypothesised associations are robust and patterns consistent, however, these studies have a number of limitations. As noted in an early paper by Monahan and Steadman (1983), studies based on institutionalised individuals do not allow to distinguish between true rates of crime and mental disorders and their treated rates. It is suggested that prevalence rates of internalising and externalising behaviour problems in institutional settings are less likely to be representative of the rates at which crime and mental disorders actually occur in the community. Numbers may rather be understood as representing the rates at which criminal justice and mental health systems respond to certain behaviour problems.

Additionally, only few studies based on clinical and correctional samples have provided specific comparative data on the prevalence among non-affected individuals and those who did include a comparison group from the general population rarely controlled for the fact that individuals in this group may also have received psychiatric treatment or have a history of offending themselves. Hence, it is very difficult, when studying institutionalised

individuals, to determine whether prevalence rates of certain behaviour problems are due to some individuals being, in fact, more or less likely to have certain problems or whether it is rather the case that individuals with certain behaviour problems are more or less likely to be selected into the specific setting.

Further, results of studies based on institutionalised individuals must be viewed with caution in sense that, for instance, aggressive and violent behaviour might also be a response to the specific setting (i.e., being confined in a psychiatric clinic or prison unit) rather than associated with an individual's mental state. Likewise, it is commonly known that prisons have their own "cultures" with norms and rules regarding appropriate conduct (e.g., Liebling & Arnold, 2004) and it has been shown that in specific cases these behaviours can look like symptoms of certain mental or personality disorders and as such, they may confound a diagnosis (e.g., Mitchell, 2018). It could be possible that the structural effects and over-regulating norms in institutional settings, including the disturbance of basic routines, the deprivation of pleasure, or deconstruction of agency (i.e., extreme feelings of guilt, shame and worthlessness) may contribute to the development of internalising and/or externalising behaviour problems (e.g., Sik, 2019).

Finally, studying people from institutionalised populations may lead to an overestimation of the problem. It is likely that incarcerated offenders as well as psychiatric inpatients are at the more extreme ends of the spectrum and as such, they may not be representative of all people with similar problems in the community. Especially, studying exclusively more extreme cases can contribute to negative stereotypes and harmful attitudes in the community.

Since the 1980s, a growing number of large-scale community-based studies has begun to investigate the relationship between mental disorders and offending behaviour. However, these studies are not without limitations either. For instance, previous research is subject to bias due to different empirical approaches to defining and measuring offending behaviour and mental disorders. While some studies are based on official data, others have used self-report methods. Studies based on official conviction data, for instance, may have underestimated the true prevalence of offending behaviour in the community, since they only include a subset of offenders, namely those who have been in contact with the criminal justice system. Similarly, studies based on self-report methods may also have inaccurately captured the true prevalence of offending behaviour in sense that individuals may have denied or exaggerated their offending behaviour. Typically, people tend to report socially undesirable behaviours less

frequently. In line with that, individuals with mental health problems may have chosen not to report their psychiatric diagnoses. Further, the accuracy of information depends greatly on the individual's ability to recall past events and as such the length of the recall period bears potential for bias. In fact, it might be generally rather difficult to precisely and accurately date episodes of mental health problems.

Further, a number of studies has investigated aggregate measures of mental disorders and offending behaviour by combining various psychiatric conditions or all kinds of criminal acts into one umbrella measure (e.g. Arsenault, Moffitt, Caspi, Taylor, & Silva, 2007; Swanson, Holzer, Ganju, & Jono, 1990). Thereby leaving unanswered the question as to whether there are associations between specific mental health problems and certain kinds of offending behaviour.

Finally, it is plausible that individuals with co-occurring internalising and externalising behaviour problems differ systematically from individuals without these problems. In fact, it may be that specific individual characteristics or life experiences influence the development of both internalising and externalising behaviour problems. Hence, it is particularly important that studies collect and examine sufficient additional information about individuals with mental disorders and behaviour problems. Only few studies have included a variety of relevant characteristics and attempted to control for their effects, which makes it difficult to establish the precise nature of the relationship between mental disorders and offending.

It suggested that, in order to further disentangle the interrelations between mental disorders and offending behaviour, more research based on well-designed longitudinal studies is needed. These studies should follow a community-based approach and allow for establishing whether associations between mental disorders and offending behaviour exist over time and over the life-course. Further, studies should contain outcome measures of offending behaviour and mental disorders that allow for more specific analyses between the various conditions and also take into account a broad range of dynamic risk factors in order to develop accurate predictive and explanatory models.

These points are also of particular relevance for establishing causal relationships, which is an important goal of empirical research in criminology. A causal effect is said to exist if change in an independent variable is followed by change in a dependent variable, given that all other factors are equal. When trying to establish a causal relationship five

criteria should be considered, out of which the first three criteria are generally regarded as requirements for identifying a casual effect (Check & Schutt, 2012).

The first criterion for establishing a causal link is an empirical association between the independent and dependent variables. Further, there must be a specific time order, in which the cause must come before its presumed effect. Third, the relationship between the two variables must be a direct, non-spurious connection. In addition, many social scientists argue that no causal explanation is adequate until a mechanism is identified, which further specifies the process by which an independent variable influences the variation in the dependent variable (Cook & Campbell, 1979, p. 35). In a similar manner, it is often suggested to also identify the context in which a causal effect occurs as it helps to understand the causal relationship. It can be assumed that no cause has its effect apart from some larger context involving other variables, including questions of when and for whom (Hage & Meeker, 1988).

Generally, experimental research provides the most powerful design for testing causal hypotheses because it allows to confidently establish the first three criteria for causality. Experiments have at least three distinct features that help to meet the criteria: They typically include two comparison groups, an experimental and a control group, to establish an association, they can reliably establish time order and randomly assign people to the comparison groups, to establish non-spuriousness. However, in social science, testing a hypothesis with a true experimental design is often not feasible or ethical. In this case researchers may instead use quasi-experimental designs.

These research designs are quasi-experimental because subjects are not randomly assigned to the experimental and comparison groups, instead researchers try to ensure that the groups meet specific criteria. Alternatively, they can also employ before-and-after designs, in which the subjects exposed to the treatment serve, at an earlier time, as their own control group. Further, if quasi-experimental designs are longitudinal, they also offer the opportunity to establish temporal order. However, with regard to establishing non-spuriousness of an observed association, quasi-experimental designs are usually weaker than true experiments, because it is more difficult to eliminate the possibility of influence from a third variable. On the other hand, these studies may be able to achieve a more complete understanding of the causal context when carried out in a more natural social setting (Bachmann & Schutt, 2013).

To date, the majority of studies has compared offenders with mental disorders to non-offenders with mental disorders, thereby assuming that offenders constitute a homogeneous group. However, this does not only seem unlikely, there is, in fact, scientific evidence that

specific subtypes exists, defined by age of onset and persistence of antisocial and offending behaviour, and that these subtypes differ from each other in terms of aetiology and response to treatment, for instance (Moffitt & Caspi, 2001; see also Hodgins, 2008). Hence, further research on mental health and crime trajectories is needed, not only for investigating early predictors, but also for identifying discrete outcomes (see also Ttofi, Piquero, Farrington, & McGee, 2019). Likewise, only little is known about the intergenerational continuity and discontinuity of antisocial behaviour and mental health problems and their interrelations (e.g., Auty, Farrington, & Coid, 2015; Loeber et al., 2002) as well as factors that may increase or decrease the intergenerational transmission.

A more comprehensive understanding of the relationship between mental disorders and offending behaviour will benefit mental health policy, clinical practice, and public perception and will have important implications for mental health and prison staff as well as the quality of life of many people. It will allow for the development and provision of clearer recommendations for policy and practice to ensure more effective delivery of care for people with mental health problems in contact with the criminal justice system and generate more insight into the mental health needs of offenders in order to minimise risks, provide early interventions and adequate treatment. In fact, prisoners with mental health problems have been shown to have an extremely high risk of victimisation, self-harm, and suicide (e.g., Fazel, Hayes, Bartellas, Clerici, & Trestman, 2016). Similarly, a better understanding of antisocial and violent behaviour in mental health care settings is crucial for ensuring safe conditions and providing appropriate care (e.g., Rueve & Welton, 2008).

A deeper insight into the factors contributing to offending behaviour and mental health problems, as well as a clearer understanding of how mental disorders may contribute to criminal behaviour and how criminal behaviour and its consequences may contribute to mental health problems will allow for the development of more rigorous and person-centred models which hopefully contribute to further eliminating stigma and other difficulties that people with internalising and externalising problems face, thereby increasing community wellbeing, quality of life and mental health. Before proceeding in more detail with the aims of this thesis and how it seeks to contribute to the knowledge and to fill some of the gaps in the scientific literature, it will be helpful to first introduce the theoretical framework that provides the grounding base for this thesis as well as the underlying concepts which will serve as a guide for the analysis and interpretation of findings.

5 Mental Disorders and Developmental and Life-course Criminology

This thesis seeks to contribute to the understanding of the association between mental disorders and offending behaviour over the life-course. Its theoretical framework is rooted in developmental and life-course criminology (see e.g., Piquero, 2015 for a review). It is beyond the scope of this thesis to provide a comprehensive review of the theory. However, this chapter briefly introduces the most influential perspectives and proposes opportunities for how the construct of mental disorders could be incorporated into the theoretical frameworks and how research on the association could benefit from the developmental and life-course perspective.

Developmental and life-course theories focus on the identification and explanation of within-individual variation in antisocial and criminal behaviour from childhood to adulthood. Despite differences between the various perspectives, developmental and life-course theories typically attempt to explain (1) the development of offending behaviour over the life-course, (2) the existence of distinct risk and protective factors and (3) the effect of life events on the course of the criminal development (Farrington, 2003, p. 221). Further, they are also concerned with the formulation of pathway models by drawing on biological, psychological, and social factors, that have been found to influence the development of criminal behaviour over an individual's life-course or have been shown to operate across generations.

Developmental and life-course theories highlight the temporal perspective by looking across individuals' life experiences or across generations to understand patterns of offending, while also recognising that both past and present experiences are shaped by the wider social, political, economic and cultural context. The construct of mental disorders is not included in most developmental and life-course theories. However, this perspective is distinct in ways that it allows for the integration of various topics for which the importance of long-term processes has been recognised and as such developmental and life-course research offers a unique opportunity to further disentangle the interrelations between mental health and offending behaviour over the life-course and across generations, in order to advance the understanding of their origins, variations and consequences. It is suggested that research on the association between mental health and criminal behaviour will profit from the incorporation of life-course principles. Before providing a short overview of some of the major theories, some of the key terms and concepts will be introduced, which are core to developmental and life-course criminology and will provide guidance for the interpretation of findings of this thesis.

5.1 Key Terms, Concepts and Perspectives

At the heart of developmental and life-course criminology lies the recognition of the robust relationship between age and crime (e.g., McAra, & McVie, 2012; Sampson, & Laub, 1992). This refers specifically to the observation that, when plotting aggregate crime data against age, the graph reveals a characteristic pattern, often referred to as the age-crime curve, which is known as one of the "brute facts in criminology" (Hirschi, & Gottfredson 1983, p. 552). This pattern typically shows a sharp rise in offending during adolescence with a peak in the late teen or early twenties, followed by a decline into adulthood, steeply at first and thereafter more steadily (Farrington, 1986).

The age-crime curve is central to the criminal career paradigm, which seeks to explain how engagement in offending changes with age. A criminal career is defined as "the characterization of the longitudinal sequence of crimes committed by an individual offender" (Blumenstein, Cohen, Roth, & Visher, 1986, p. 12). The paradigm is concerned with both the heterogeneity in offending between individuals as well the stability and change in criminal behaviour over time within the individual (i.e., onset, persistence, desistance). In this context, Farrington (1986) has demonstrated that the pattern of the age-crime curve can most likely be explained by changes in participation in offending, reflecting "decreasing parental controls, a peaking of peer influence in the teenage years, and then increasing family and community controls with age" (p. 236).

The risk factor prevention paradigm builds on the work of the criminal career paradigm. Risk factors are typically defined as adverse characteristics, circumstances, or behaviours that have been found to be predictive of an individual's onset of offending or some other aspect of the criminal career. Over the years a wide variety of risk factors for the early onset of offending behaviour have been identified, including individual, family, socio-economic, peer, school, and neighbourhood factors (Farrington, 2003). Further, research has suggested that desistance from offending in late adolescence or adulthood can also be predicted by more dynamic life events, including marriage or a stable and satisfying employment (Laub & Sampson, 2003).

Over the last decades, a number of theoretical perspectives have emerged which attempt to explain the characteristic pattern of the age-crime curve and the complex development of criminal behaviour over the life-course and across generations. The following section presents a short overview of some of the most influential perspectives and attempts to

suggest opportunities for the integration of the construct of mental disorders, in order to further disentangle the interrelations between crime and mental health problems.

5.1.1 The social development model

The social development model, as proposed by Hawkins and Catalano (1996), is a synthesis of social learning theory (Bandura, 1977; Burgess, & Akers, 1966), social control theory (Hirschi, 1969) and differential association theories (Matsueda, 1988; Sutherland, 1947, 1973). The theory is based on the assumption that prosocial and antisocial behaviour are learned through the same socialisation processes. Catalano, Oxford, Harachi, Abbott and Haggerty (1999) suggested that socialisation processes involve four constructs: (1) perceived opportunities for involvement in activities and interactions with others, (2) the degree of involvement and interaction, (3) the skills to participate in this involvement and interaction and (4) the reinforcement they [children] perceive from this involvement and interaction (p. 41). Overall, it is assumed that a successful socialisation process leads to social bonding (Catalano, & Hawkins, 1996). Further it is theorised that if the process involves family members and peers with prosocial norms, values, and beliefs, then the socialised individual will tend to adopt these prosocial norms, values, and beliefs. However, if the process involves individuals who behave deviant, then the individual is thought to be more likely to also engage in antisocial behaviours (e.g., Fleming, Brewer, Gainey, Haggerty, & Catalano, 1997). In terms of mental disorders, research has shown that some of the risk factors (e.g., hyperactivity, problematic temperament) associated with the success of the socialisation process in the social development model are also related to mental disorders (Mrazek, & Haggerty, 1994; Karpinski, Kinase Kolb, Tetreault, & Borowski, 2018; Piquero et al., 2012). Hence, in line with this perspective, mental disorders could be linked to unsuccessful and deviant socialisation processes and thereby explain part of the development of antisocial behaviour.

5.1.2 The age-graded theory of informal social control

Sampson and Laub's (1993, 2005) age-graded theory of informal social control is based on Hirschi's (1969) social bonding theory and suggests that involvement in offending can be explained by an individual's attachment to society (i.e., parents, siblings, school, peers). It is assumed that people who bond well with significant others build social capital (see also Coleman, 1988; Hagan, 1998), characterised by positive relationships built on trust and reciprocity and as a consequence these individuals perceive deviance as too costly. Accordingly, offending behaviour is expected to occur when social bonds are weakened.

Specifically, it is suggested that variation in the strength of those social bonds are impacted by certain life events, such as marriage and employment. It is theorised that life events affect an individual's prosocial and antisocial choices. As rather short-term discrete events they are often conceptualised as turning points, which can lead to an individual's desistance from offending. Besides a strong focus on social bonds, the age-graded theory of informal social control makes also reference to the concept of human agency (Laub, Rowan, & Sampson, 2019). It could be argued that severe mental health problems, which have been linked to an increased risk of unemployment, stigma and social isolation (i.e., weakened social bonds) (e.g., Butterworth, Leach, Pirkis, & Kelaher, 2012; Corrigan, Larson, & Rüsch, 2009; Link, & Phelan, 2001; Staiger, Waldmann, Oexle, Wigand, & Rüsch, 2018) could, in line with this theoretical perspective, affect an individual's prosocial and antisocial choices. Further, the onset (or diagnosis) of a mental health problems could be framed as a major life event or turning point in an individual's life, which may have an impact on their propensity to begin, persist in or desist from offending. It could be theorised, for instance, that desirable circumstances like supported employment or staying out of hospital could be placed at risk by engaging in criminal activities (Fisher, Silver, & Wolff, 2006) or that the lack of healthy connections (i.e., supportive social bonds) carries health and mortality risks (see e.g., Holt-Lunstad, Smith, & Layton, 2010 for a review).

5.1.3 Self-control synergistic theory

The social learning and self-control synergistic theory, as formulated by Jennings, Higgins, Akers, Khey and Dobrow (2013), combines aspects of self-control theory (Gottfredson, & Hirschi, 1990) and social learning theory (Akers, 1998). Jennings and colleagues (2013) have particularly focused on the construct of self-control integrated in both theories. While the classical theories asserted a relative stability of self-control throughout childhood and adolescence, Jennings and colleagues (2013) theorised that the presence of antisocial peers, for instance, may lead to decreased levels of self-control, which in turn could increase the likelihood of an individual's engagement in offending behaviour. With regard to mental disorders, it could be hypothesised that self-control deficits associated with some psychiatric conditions (e.g., DeLisi, Tostlebe, Burgason, Heirigs, & Vaughn, 2018; Johnson, Ashe, & Wilson, 2017) could explain why some individuals choose to engage in antisocial behaviour in the presence of delinquent peers. Mental disorders could further specify the theory regarding the complex interrelations between self-control, delinquent peers and antisocial or criminal behaviour.

5.1.4 Situational action theory of crime causation

More recently, Wikström (2005) has developed the situational action theory, which is a mechanism-based theory of crime and its causes. In this theoretical perspective crimes are conceptualised and explored as moral actions. Situational action theory explains crime as the result of the interaction between an individual's propensity to offend and the exposure to a certain criminogenic setting (Wikström, & Treiber, 2019). The key construct of situational action theory is crime propensity, which derives from the combination of an individual's ability to exercise self-control and their moral judgement. By focusing on moral rules, this approach does not only seek to explain why an individual engages in offending behaviour, but also why they perceive crime as an option (see also McGee, & Farrington, 2019). According to this theory, continuity, discontinuity, or overall change in offending over the life-course depends on changes of either moral values, executive functioning (i.e., criminal propensity) or environmental conditions (i.e., criminogenic exposure). Thus, with regard to an individual's crime propensity, it could be theorised, for instance, that deficits in emotion recognition or an overly hostile perception of social relationships in general (e.g., as a consequence of poor executive functioning), may be associated with mental health problems (e.g., Frenske et al., 2015; Lazarus, Cheavens, Festa, Zachary, & Rosenthal, 2014).

5.1.5 The integrated cognitive antisocial potential theory

The integrated cognitive antisocial potential theory, developed by Farrington (2005), is one of the few theories that seek to explain both between-individual differences (i.e., why people become offenders) as well as within-individual differences (i.e., why offenders commit crimes in certain situations) in offending behaviour. The central concept of this theory is the so-called antisocial potential, which refers to an individual's propensity to engage in antisocial and criminal behaviour and can be divided into long-term and short-term antisocial potential. The former is related to an individual's cognitive and developmental features, while the latter is influenced by more situational factors and opportunities. Explanations for antisocial potential encompass ideas from several traditional criminological theories, including strain, social control, social learning, labelling and rational choice theories. Long-term between-individual differences in antisocial potential are explained by, for instance, impulsive behaviour, self-control, social skills, parental practices, and attachment. Short-term within-individual differences refer to more situational factors including substance use and peer pressure. However, it is thought that the combination of these factors is what makes

crime. In line with this perspective's conceptualisation of long-term antisocial potential, research has suggested that some mental health problems may influences an individual's underlying propensity to commit crime (e.g., Farrington, Brunton-Smith, Loeber, Ahonen, & Palacios, 2019; Hodgins, DeBrito, Chhabra and Côté, 2010; Raine, 1993).

5.1.6 Interactional theory

The interactional theory, as developed by Thornberry (1987; see also Thornberry, & Krohn, 2001, 2005, 2019), considers social control and bonding constructs, including attachment to parents and commitment to school as some of the most important predictors of offending behaviour. The core aspect of interactional theory is its reciprocal and dynamic nature, which assumes that the causes of crime are reciprocally related over time. For instance, it is proposed that weak bonds to significant others (i.e., parents, peers, school) affect offending and in turn offending behaviour has an effect on these bonds, via so called feedback loops. The interactional theory differentiates between early-onset offenders and late-onset offenders and suggests that the behaviour of early-onset offenders is more influenced by neuropsychological deficits and difficult temperament (e.g., impulsiveness, poor emotion regulation), ineffective parenting styles (e.g., low affective ties, child maltreatment) and social disadvantage (e.g., poverty, welfare dependency), while the behaviour of late-onset offenders is more strongly affected by social factors (i.e., peers, school). Notably, the interactional theory also seeks to explain the intergenerational continuity and discontinuity of antisocial behaviour (Thornberry, 2009) and overall, it is suggested that parental criminal behaviour is significantly related with offspring criminal behaviour. In line with this assumption, some mental disorders have been shown to have highly heritable components (e.g., Paananen, Tuulio-Henriksson, Merikkuka, & Gissler, 2020). In addition, research indicates that parental offending behaviour may be associated with mental health problems among children (Auty, Farrington, & Coid, 2015; Loeber et al., 2002).

5.1.7 Developmental taxonomy of crime

Moffitt's (1993) developmental taxonomy is built on the offending patterns identified in the age-crime curve. Based on the observation, that the prevalence of offending (i.e., the percentage of offenders) increases from late childhood, peaks during adolescence, and then declines slowly in adulthood (e.g., Farrington 1986), Moffitt (1993) has proposed two distinct types of offenders: the adolescence-limited offender and the life-course persistent offender. The former typically only offends during adolescence, while the latter commits a variety of crimes throughout their whole lives. It is suggested that adolescence-limited offenders'

behaviour is influenced by peer pressure and/or the maturity gap, which is defined as the gap between the onset of biological maturity and social maturity (Moffit, 1993), whereas life-course-persistent offenders' behaviour is believed to be associated with neuropsychological deficits, which, when combined with negative social environments, can lead to long-term criminal behaviour (Moffit, 1993; see also Farrington, 2003; Piquero et al., 2012). Recent research has indicated that there may be more offender types, including an adult-onset offender, who only starts offending as an adult (Kratzer, & Hodgins, 1999; McGee & Farrington, 2010). Notably, a great number of risk factors and features of the two offender types have been examined, but only few have attempted to link mental disorders with offender trajectories. In one such study, for instance, it was found that psychopathy scores were highest among chronic offenders, followed by adolescence-peak offenders and lowest among non-offenders (Piquero et al., 2012). Further, research indicates that risk factors for life-course persistent offending overlap with those for some of the more severe mental disorders. For instance, child neglect and abuse have been shown to be associated with both psychopathy (Weiler & Widom, 1996) and psychopathic traits in adult criminal offenders (Dargis, Newmn, & Koenigs, 2016).

5.1.8 Developmental propensity model

The developmental propensity model, as proposed by Lahey and Waldman (2003, 2005) suggests that children's dispositions to respond emotionally to the environment are key factors in the development of conduct disorder and antisocial behaviour. It is hypothesised that there are three relatively stable emotional dispositions: (1) a sympathetic response to other people (i.e., prosociality), (2) a negative emotional response to threat and frustration (i.e., negative emotionality), and (3) a positive response to novel and risky situations (i.e., daring). Prosociality is defined by a sympathetic concern for others, respect for social rules and guilt over misdeed. Further it is hypothesised to facilitate social bonding (Lahey et al., 2008). Negative emotionality is found in children who tend to be easily and intensely upset by frustrations and threats and in turn react with intense negative affect (i.e., aggressive behaviour) (Lahey, & Waldman, 2003). Notably, negative emotionality has been linked to the construct of neuroticism (Costa, & McCrae, 1987), although it differs from it, as the authors declare, by not explicitly including items such as fear, anxiety and depression (Lahey et al., 2008). Daring is defined by brave and adventurous behaviour (see also Farrington, & West, 1993), sensation-seeking (see also Russo et al., 1993) and by enjoying risky and loud activities (Lahey et al., 2008). With regard to mental disorders, the concept of negative emotionality seems to overlap with certain traits and behaviours seen in individuals with

mental disorders. In fact, research has shown that negative emotionality is positively correlated with a wide range of mental health problems, including depression and anxiety disorders (e.g., Lahey, 2009; Oldehinkel, Hartman, Ferdinand, Verhulst, & Ormel 2007; Ruocco, Amirthavasagam, Choi-Kain, & McMain, 2013).

5.2 Summary and Further Steps

The developmental and life-course approach has a strong theoretical foundation in criminology and a well-established basis in empirical research. Its key strength is its ability to establish precise temporal order of events, experiences, socialisation processes, as well as structural and situational factors over the life-course and across generations, thereby advancing knowledge about onset and desistance, about persistence and prediction, and about within-individual change. It is a multi- and interdisciplinary enterprise that incorporates aspects of and empirical findings from various disciplines, including criminology, psychology, sociology, and biology. Developmental and life-course criminology allows for examining multiple life domains and incorporating the full range of phenomena that can affect an individual over the life-course. As such it provides a unique opportunity to investigate long-term processes of mental disorders and offending behaviour and to further disentangle their proposed interrelations, in order to advance the understanding of their origins, variations and interdependence. Hence, it is not surprising that a number of researchers have called for greater integration of the mental health and criminal offending literature (e.g., Farrington, 2005; Jennings, Gover, & Piquero, 2011). This thesis is an attempt to contribute to the integration.

The preceding review of the literature has shown that anxiety and depression are highly prevalent in the general population and contribute substantially to the global burden of disease (WHO, 2008). However, compared to other mental disorders, these two conditions are less frequently studied in the context of crime, specifically as potential outcomes of offending behaviour, as suggested by recent research (Jolliffe et al., 2019). Further, it has long been noted that there is enormous heterogeneity among offenders (Piquero, 2008), but less is known about the predictive effects of distinct offending pathways on mental health. Only recently has research moved further forward from examining risk and protective factors to describing how the offending trajectories themselves may relate to life outcomes (Piquero et al., 2012).

Moreover, previous studies have constantly found a high prevalence of personality disorders in offenders in general and in violent offenders in particular (Yu, Geddes, & Fazel,

2012). However, only few community-based studies of crime include measures of personality disorders and those that do typically examine a single combined dimension of personality disorders or focus on personality disorder clusters (e.g., Putkonen, Komulainen, Virkkunen, Eronen, & Lönnqvist, 2003; Wallace et al., 1998), instead of differentiating between specific diagnoses. In fact, it has been suggested that a symptom-focused approach may be preferable, not only in an attempt to fully recognise people's lived experiences, but also for the success of treatment (Moncrieff, 2010). Finally, even though it is widely recognised that childhood risk factors play an important role in the development of offending behaviour and research indicates that personality disorders have their origins in the early years of life, only little is known about early-life factors that may help to explain why some people are more likely to develop personality disorders and to engage in violent behaviour.

This thesis aims to further unravel the complex relations between mental disorders and offending behaviour by addressing the gaps in the literature and employing data from a well-designed community-based prospective longitudinal study to examine: (1) anxiety and depression outcomes of distinct offender trajectories (Paper I and Paper II), (2) the intergenerational transmission of offending behaviour and certain mental health problems (Paper II), (3) the association between specific personality disorder symptoms and violence over the life-course (Paper III) and (4) childhood risk factors for specific personality disorders related to violence (Paper III).

6 Paper I – Depression and Anxiety Outcomes of Offending Trajectories: A Systematic Review of Prospective Longitudinal Studies[14]

The aim of this paper was to conduct a systematic review and meta-analysis of the association between offending trajectories and mental health outcomes, specifically anxiety and depression. Traditionally, criminologists have studied the differences between those who engage in offending behaviour and those who do not. Taking an alternative perspective, developmental and life-course criminologists assume a more dynamic approach and focus on the development of delinquent behavior over time within individuals. Over the last decades, a number of researchers has presumed that patterns of criminal offending are not the same for all offenders, leading them to stress the importance of distinguishing between distinct groups or typologies of offenders, a methodological enterprise with direct social and financial implications for designing more precise and effective interventions (Cohen & Piquero, 2009).

From a policy perspective it is particularly important to precisely identify and define target populations, in order to develop criminal justice responses (i.e., prevention and correctional efforts) that are appropriately tailored and allow for accurately identifying and addressing specific problems underlying different kinds of offending behaviour (Adams & Fondacaro, 2008). Given the considerable diversity in offending over the life-course (e.g., Jennings, & Reingle, 2012; McGloin, Sullivan, Piquero, & Pratt, 2007; Piquero 2000), typologies of criminal activity are likely to have a greater use for policy makers and practitioners. Over time, a number of methods have been proposed to assist the sorting of different forms of criminality into more homogenous groups, as researchers have been sceptical that a single theory can account for the entire array of crimes or criminals.

Criminologists have developed both crime-centered and person-centered typologies. While crime-centered typologies focus on sorting criminal activities into homogeneous groups, person-centered typologies assign individuals to criminal roles and careers based on similarities in their criminal involvement, behaviour patterns and other presumably relevant psycho-social characteristics and features. A categorisation into such person-centered typologies may facilitate not only crime prevention but also mental health intervention efforts,

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the success of which depends on accurately identifying and addressing specific problems underlying different types of antisocial and criminal behavior (e.g., Gibbons, 1965).

6.1 Offender Groups and Mental Health

Within developmental and life-course criminology, and among theoretical offender-based models, Moffitt's (1993) analytical framework is one of the most elaborated attempts to define groups of offenders. In the original delineation of the developmental taxonomy, Moffitt classified offenders into two distinct groups, as either adolescence-limited (AL) or life-course-persistent (LCP). Both developmental processes have their own theoretical explanations. AL offenders are hypothesised to restrict their involvement in delinquency to their teenage years and sociological approaches postulate that this may be a result of the maturity gap – the incongruity between the age of attainment of biological and social maturity (i.e., adult status) in society – which interacts with increasing importance of peer contexts during adolescence (i.e., peer group dynamics) (Moffitt, 1993). In contrast, LCP offenders are characterised by continuity in their antisocial and criminal behavior over the life-course. Their offending may be explained by interweaving neuropsychological vulnerabilities during childhood and varying criminogenic environments. Notably, Moffitt (1993) conceptualised LCP offenders as having increased neuropsychological vulnerability ("life-course-persistent antisocial behavior is a form of psychopathology", p. 679), which may indicate that LCP offenders have traits that are associated with generally higher psychological vulnerability.

This dual taxonomy has been expanded in recent years in an attempt to capture all offenders within the age-crime curve. Kratzer and Hodgins (1999), for instance, identified a third group of offenders, namely late-onset (LO) offenders, who only initiate their offending after adolescence (see also Carrington, Matarazzo, & De Souza, 2005; McGee & Farrington, 2010; Zara & Farrington, 2009). Empirical approaches to systematically categorise individuals into criminal trajectories have often used Moffitt's developmental taxonomy as an organising analytical framework and they have been able to replicate and empirically identify very similar subgroups of offending individuals. However, a lot of research has expanded this earlier framework and the heterogeneity in developmental offender trajectories has moved beyond the identification of the two groups conceptualised in Moffitt's original approach (see e.g., Jennings, & Reingle. 2012; Moffitt, 2018; Piquero, 2008).

Although many of the initial trajectory studies used a priori classification schemes for the definition of antisocial trajectory groups, more advanced statistical analyses and data-driven approaches, such as semiparametric group-based trajectory modelling (Nagin, 2005;

Nagin & Land, 1993) and latent growth mixture modelling (Muthén & Muthén, 2000; Muthén & Shedden, 1999) have allowed the most "naturally occurring" trajectories to emerge from the data, which typically include between four to six distinct trajectory profiles (Petras & Masyn, 2010).

Studies on the classification of offenders commonly utilise auxiliary information in form of covariates (i.e., personal and contextual factors) to show, across many longitudinal datasets, how different factors and mechanisms may explain or account for different stages of a delinquent career (Wiesner & Windle, 2004). Some of these studies also investigated how mental health variables (such as anxiety and depression) may affect the development of different antisocial pathways (e.g., Jolliffe, Farrington, Piquero, Loeber, & Hill, 2017a; Pepler, Jiang, Craig & Connolly, 2008), while others, although overall only very few studies, have looked at mental health problems as the outcome of different offending trajectories (e.g., Piquero et al., 2012).

Despite the abundance of prospective longitudinal studies, the examination of differences between various offender groups that follow distinct developmental trajectories is still a relatively new topic (Petras & Masyn, 2010; Wiesner & Windle, 2004). For instance, a recent systematic review identified 55 prospective longitudinal studies, of which only 14 had produced information on the prevalence of different offending types (Jolliffe, Farrington, Piquero, MacLeod, & van de Weijer, 2017b). Notably, Jolliffe and colleagues (2017b) also stressed the variability in the estimates of the prevalence of AL, LO and LCP offenders, which could relate to the varying definitions for the creation of these groups across studies.

Further, in another review, Jolliffe and colleagues (2017a) highlighted that LCP offenders tended to have a greater number of risk factors, and the magnitude of these was somewhat greater than for AL offenders, who in turn tended to have more risk factors – and of a greater magnitude – than LO offenders. In other words, LCP and AL offenders do not seem to differ in kind (i.e., in the specific factors that are predictive) but rather in degree of risk factors, hence it is imperative that mental health and criminal justice professionals address their varying needs. Evidence about LCP antisocial behavior provided impetus of the early-years crime prevention movement (Moffitt, 2018), but the evidence about AL antisocial behavior is less appreciated although it provides impetus for movements to reform juvenile justice and mental health services in directions that are more supportive of young people (Farrington, 2011; Moffitt, 2018; Monahan, Steinberg, & Piquero, 2015).

The aim of this systematic and meta-analytic review is to synthesise what is known about mental health outcomes for different offender trajectories based on prospective longitudinal studies. It is hoped that this overview will draw reliable conclusions and deliver more precise results and information for policymakers and healthcare providers. To the best of our knowledge, this is the first systematic review on the relation between offending trajectories and mental health outcomes (i.e., anxiety and depression). The main aim is to address the question of whether there are differences in mental health outcomes for AL, LO, and LCP offenders.

Establishing different mental health needs for different types of offenders may provide evidence for more appropriately tailored mental health prevention and intervention strategies that, not only work better, but are also more cost-effective. The average ages of onset for LCP and AL offenders are similar (Jolliffe, Farrington, Piquero, MacLeod, & van de Weijer, 2017b) although the two groups differ in degree of risk factors (Jolliffe, Farrington, Piquero, Loeber, & Hill, 2017a), which could potentially mean varying levels of mental health needs, given the strong association between risk factors and mental health for both incarcerated individuals and the general population (Kataoka et al., 2001; Loeber, Farrington, Stouthamer-Loeber, & van Kammen, 1998).

6.2 Methods

A systematic approach was used to identify research addressing the question of whether adverse mental health outcomes vary across the main offending typologies, with a focus on anxiety and depression. A preliminary search to identify previous reviews did not yield any results, making the present paper the first effort to systematically assess articles on the relation between developmental offending trajectories and adult mental health outcomes (i.e., anxiety and depression).

6.2.1 Search strategy

Searches were conducted in two steps. The first step involved the identification of all major longitudinal studies that potentially possess relevant information about participants' criminal careers. This search was based on previous reviews (e.g., Jolliffe, Farrington, Piquero, MacLeod, & van de Weijer, 2017b; Jennings, & Reingle, 2012) and the authors' existing knowledge of major longitudinal studies. In a second step, a comprehensive systematic search using multiple information sources was conducted in an attempt to uncover all eligible articles based on studies identified in the first step. Several electronic databases,

including Web of Science, PsychINFO, Scopus, and Google Scholar, were searched using appropriate indexing terms, qualifiers, and logical Boolean operators. The sensitivity of initial search terms was evaluated and enhanced by comparing articles identified against those already known to the authors. If an article did not appear in the results of a search, the title and abstract were reviewed to identify terms that would improve the sensitivity, and the search was repeated with adaptations. Systematic searches were performed by combining the name of each longitudinal study with two groups of keywords. The first group comprised the keywords "taxonom*", "developmental trajector*", "offending trajector*", "delinquency trajector*", "aggressi* trajector*", "group-based trajector*", "delinquent development", "criminal career", "lifecourse-persistent", "adolescence-limited" and "late-onset". The second group comprised the keywords "depress*", "anxi*", "mental health", "mental illness" and "mental disorder". Searches were not limited by time constraints and the literature search process was finalised in December 2017.

6.2.2 Inclusion and exclusion criteria for screening reports

Literature searches and subsequent screening of reports were completed following clear inclusion/exclusion criteria which were set in advance. Only reports based on prospective longitudinal studies were included in the review, but no other methodological design restrictions were imposed. Included studies were required to:

(1) be based on a general community sample of at least 200 individuals. It is assumed that results of community samples are more likely to be externally valid and applicable beyond the group studied and smaller studies would not include a sufficient number of offenders.

(2) be based on studies that started collecting information in childhood or early adolescence and have follow-up information about offending or aggression into early adulthood. Longer time spans allow a more detailed exploration of within-individual variation over the life span and a clearer determination of developmental offending patterns (i.e., they reduce misclassification errors).

(3) contain measures of self-reported and/or official antisocial behaviours, including aggression, delinquency, and offending, permitting study participants to be classified into distinguishable offender subtypes. These could either be determined conceptually by using, for example, Moffitt's (1993) dual taxonomy or be operationally determined by using group-based trajectory modelling as laid out, for instance, by Nagin and Land (1993).

(4) contain measures of self-reported and/or official adult mental health outcomes, namely symptoms of depression and/or anxiety.

(5) be published or unpublished (e.g., PhD theses; Carkin, 2014), in order to avoid publication bias relating to omission of grey literature (Wilson, 2009).

(6) have reported their findings in English. However, there were no geographical restrictions imposed as to where the research was conducted.

(7) have measured offending trajectories before measuring mental health outcomes.

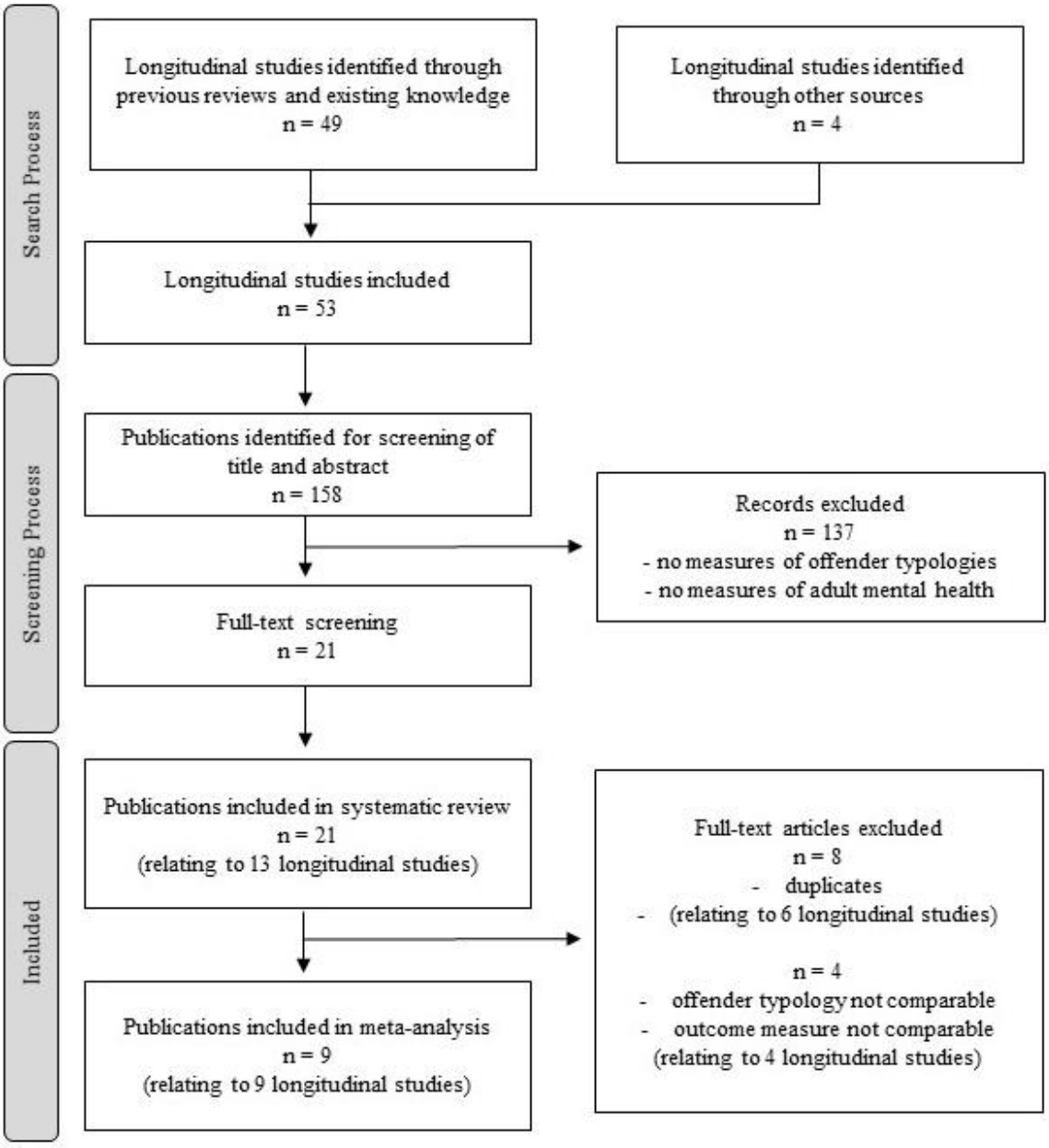
Mental health problems, just like other auxiliary information (Petras & Masyn, 2010), could be seen as either the cause or consequence of a (varying in length and in other characteristics) criminal career. However, this review only focuses on anxiety and/or depression as the "outcome" of offender participation. This strict time sequence and analytical approach may provide evidence for more appropriately tailored mental health prevention and intervention strategies for different offender groups.

Reports on offending trajectories based on longitudinal studies that conducted analyses within a wave, making them essentially cross-sectional in character, as well as reports based on cross-sectional data were excluded (Moore, Silberg, Roberson-Nay, & Mezuk, 2017). Likewise, reports in which distant proxies to mental health were utilised were also excluded. For example, a PhD thesis by Carkin (2014), based on the 1958 Philadelphia Birth Cohort Longitudinal Study, was excluded as it presented results on "psychological treatment" (rather than mental health) and also because it did not correlate this latent variable to offending trajectories (ibid, pp. 137-138).

Further, longitudinal studies were excluded that presented data on a mental health outcome that was combined with another variable. For example, a report on the Swedish Individual Development and Adaption study was excluded (Stattin & Bergman, 2010), because depression was combined with other outcome measures (i.e., adjustment disorder with and without depression was combined with other externalising disorders such as substance use disorder and conduct disorder). In addition, reports which presented data on mental health problems for offender groups were excluded when their typologies were not comparable with other typologies included in the meta-analysis. For example, a report relating to the From a Boy to A Man birth cohort study (Elonheimo et al., 2007) was excluded because their offender typologies were constructed based on types of crime rather than based on offence duration and/or age. Finally, two reports relating to the Pittsburgh Girls Study (i.e.,

van der Molen et al., 2015) and the Avon Longitudinal Study of Parents and Children (i.e., Kretschmer et al., 2014) were excluded, because their offender trajectories were created based on a limited age range (of ages 6 to 12 and ages 4 to 13, respectively) which would not sufficiently capture even the AL trajectory, let alone capture the typologies of LO or LCP offending. The inclusion/exclusion process had two stages. First, all relevant articles were considered based on their title, abstract, and keywords. If reviewers agreed that articles did not meet the inclusion criteria, they were excluded; otherwise, they were included in the second stage. In this stage, the full text of each remaining article was read to make a final inclusion/exclusion decision. This process is summarized in the following flowchart.

Figure 1. Flowchart of study selection.



6.2.3 Data abstract and multiple reports relating to each longitudinal study

A total of 158 original publications were identified in the electronic search, based on 53 included prospective longitudinal studies. The final systematic review included 21 articles, all of which were identified through title, abstract, and full-text screening. These 21 reports relate to 13 longitudinal studies. Not all reports were included in the meta-analysis (see below). In addition to detailed online searches in indexing databases, experts in the field were contacted to provide further relevant publications. We have contacted the principal investigators or leading research associates of each longitudinal study, communicated with them the results of our online searches relating to their study, and asked for their input. The vast majority of longitudinal researchers responded to our emails and confirmed whether they had no relevant data (on mental health, for example) or whether such data potentially existed but no relevant analyses on this topic were completed yet (see Appendix Table A). Specifically, a number of these studies confirmed that they have information available, but that analyses have not been conducted or published yet (e.g., Ahonen, 2018; Eisner, 2018; Huizinga, 2018; McVie, & McAra, 2017; Treiber, 2018). Furthermore, a few researchers reported that the sample size of the offender population was too small for the application of offending trajectories (e.g., Goodman, 2017) or that measures on mental health were not included (e.g., Weerman, 2017; McCubbin, 2017).[15] Since each longitudinal study has a large number of linked publications, the names of all 53 studies were included in the database searches, regardless of the information obtained in the exchange of emails. This was done to ensure no publications would go unnoticed. In all cases, our search results corresponded to the information obtained from principal investigators and research association.

Appendix Table A reports the total number of longitudinal studies that were included or excluded in the present review. The vast majority of reports (87%) were excluded as they did not include measures of mental health or analyses based on offender typologies. This finding was, to a great extent, anticipated due to the findings of the earlier systematic reviews by Jolliffe and colleagues (Jolliffe et al., 2017a, 2017b). Of the remaining 21 reports, one was excluded due to incomparability in offender typologies (Elonheimo et al., 2007), one was excluded due to incomparability in the outcome measure (Stattin & Bergman, 2010) and two others were excluded due to the short age-range for the creation of offending trajectories

[15] We were unable to establish communication for four longitudinal studies (i.e., the Chinese Longitudinal Study, the Crime in the Modern City Study, the National Survey of Health and Development, and the Woodlawn Longitudinal Project).

(Kretschmer et al., 2014; van der Molen et al., 2015). Eight other reports were excluded because they were, to an extent, duplicate reports relating to the same longitudinal study. In the case of "duplicate" multiple reports relating to the same longitudinal study, it was opted for the most up-to-date data.

This was done for the Cambridge Study in Delinquent Development (excluded: Piquero et al., 2010, 2011), for the Collaborative Perinatal Project (excluded: Piquero, Leah, Gibson, Piquero, & Tibbetts, 2007), the Dunedin Multidisciplinary Health and Development Study (excluded: Moffitt, Caspi, Harrington, & Milne, 2002; Odgers et al., 2007), the Lives Across Time Study (excluded: Wiesner & Windle, 2004), the Mater University Study of Pregnancy (excluded: Bor, McGee, Hayatbakhsh, Dean, & Najman, 2011). One exception to this rule refers to the reports relating to the Oregon Youth Study, for which an older report (Wiesner, Kim, & Capaldi, 2005) was chosen over a newer publication (Wiesner, Capaldi, & Kim, 2013) due to comparability with trajectories included in the present meta-analysis. Specifically, the report by Wiesner and colleagues (2013) presents data on high-level and low-level chronics and on rare offenders, which could be 'translated' into life-course-persistent versus nonoffenders. However, it has no information on adolescence-limited offenders.

On the other hand, the older report (Wiesner, Kim, & Capaldi, 2005) presents data on the above-mentioned trajectories as well as data on "decreasing high- and low-level offenders", two categories that were combined to make a total "adolescence limited" category due to the age used in these trajectories (which was comparable to what was used on the other individual studies included in this meta-analysis). In the end, nine reports relating to nine longitudinal studies were comparable enough for inclusion in a meta-analytical synthesis. The following paragraphs summarize the key information on the nine studies that published data relevant to the aims of our meta-analysis. We present information on sample, measurements, and methods. The studies are arranged alphabetically by name.

(1) Cambridge Study in Delinquent Development (CSDD). The Cambridge Study in Delinquent Development is a prospective longitudinal study of the development of antisocial behavior in 411 South London males from age 8 onwards (e.g., Farrington, Piquero, & Jennings, 2013). The CSDD began in 1961 and the sample represents the complete population of boys of that age in that area at that time. The males have been interviewed nine times between ages 8 and 48. Delinquent and criminal behavior was measured using self-reports and official conviction records. Developmental subtypes of offending behavior were

estimated based on official records using Moffitt's (1993) a priori classification of offender groups. In additional analyses the original groupings were supported by advanced statistical analyses (see e.g., Nagin, Farrington, & Moffitt, 1995). Overall, there were three antisocial groups: G1: adolescence-limited offenders (first offence before age 20 and last offence before age 30), G2: late-onset offenders (offences only after age 20) and G3: life-course persistent offenders (first offence before age 20 and at least another offence after age 30) (Jolliffe et al., 2017a, 2017b). Adult mental health outcomes were measured at ages 32 and 48 using the General Health Questionnaire (GHQ-30, Goldberg, 1972). The GHQ was designed to capture non-psychotic psychiatric disorders. Symptoms of anxiety and depression are represented in two subscales of the GHQ (Farrington, Piquero, & Jennings, 2013).

(2) Christchurch Health and Development Study (CHDS). The Christchurch Health and Development Study is a longitudinal study that followed the health, education, and life progress of a group of 1,265 children born in the urban region of Christchurch, New Zealand in mid-1977. The CHDS began in 1977 and participants have been followed up more than 20 times since then. Latent trajectory models were fitted to self-reported conduct problems and offending behavior from ages 8 to 21. Overall, four antisocial groups were identified: G1: early onset adolescence-limited offenders, G2: intermediate onset adolescence-limited offenders G3: late-onset adolescence-limited offenders, and G4: chronic offenders (Fergusson & Horwood, 2002). Adult mental health outcomes were measured using the Composite International Diagnostic Interview (WHO, 1993), and DSM-IV major depression and anxiety disorders were captured during the age periods 21 to 25, 26 to 30, and 31 to 35.

(3) Collaborative Perinatal Project (CPP), Providence, Rhode Island cohort. The Collaborative Perinatal Project is a longitudinal multicentre study aimed at identifying the role of perinatal and prenatal factors in child health (Klebanoff, 2009). From 1959 to 1966, approximately 4,140 pregnant women at participating Providence hospitals were enrolled in the study, and 3,952 offspring were assessed at birth and followed up until age 7. In 1999 to 2000, a subsample of offspring was followed up; this follow-up included the search of adult arrest records as well as the collection of self-report information on adolescent antisocial behavior and adult health problems (see Piquero & Buka, 2002). Antisocial groups were identified by cross-classifying adolescent and adult groups for the 801 study participants (475 females, 326 males) were classified into one of two antisocial groups: G1: adolescence-limited offenders, and G2: life-course-persistent offenders. Participants reported on their adult overall mental health status using a five-point scale (Paradis, Koenen, Fitzmaurice, & Buka, 2016).

(4) Columbia County Longitudinal Study (CCLS). The Columbia County Longitudinal Study is a study of 856 third graders in Columbia County, a semirural county in New York State that began in 1960 and has collected four waves of data since then (Huesmann et al., 1984, 2002). The entire population of third graders in the county participated in the first wave in 1960. Follow-up assessments were conducted in 1970, 1981, and between 1999 and 2002. Aggression was assessed at baseline and then at ages 19, 30, and 48. In this study, aggressiveness is a latent construct that measures antisocial behavior, but no nonaggressive antisocial behavior (Huesman, Dubow, & Boxer, 2009). Five subtypes of individuals were defined, based on their composite aggression scores: G1: childhood-limited aggressives (above threshold at age 8 but below at ages 19 and 30), G2: adolescence-limited aggressives (above threshold at age 19 but below at ages 8 and 30), G3: late-onset aggressives (above threshold at age 30 but below at ages 8 and 19), G4: life-course persistent low aggressives (above threshold at ages 8, 19, and 30), and G5: life-course persistent high aggressives (above threshold at ages 8, 19, and 30). Depression was assessed at age 48 using the Brief Symptom Inventory (BSI) of the Symptom Checklist-90 (Derogatis, 1992). The BSI is a widely used measure for psychological distress, based on a 5-point scale.

(5) Dunedin Multidisciplinary Health and Development Study (Dunedin Study). The Dunedin Multidisciplinary Health and Development Study is a longitudinal study of the health, development, and well-being of 1,037 individuals (498 females, 54 males) born between 1972 and 1973 in Dunedin, New Zealand. Participants were studied at birth and followed up more than 12 times until age 38. Antisocial conduct problems were measured between ages 7 and 26 years through a composite score of six key symptoms of DSM-IV conduct disorder (APA, 1994). Based on this score, latent trajectory models were fitted to assign study participants to one of the following four trajectory classes: G1: antisocial low, G2: childhood limited, G3: adolescent onset, G4: life-course persistent (Odgers et al., 2008). Adult mental health outcomes were assessed at age 32 in private structured interviews using the Diagnostic Interview Schedule (Robins, Cottler, Buckholz, & Compton, 1995). Diagnoses were made according to DSM-IV criteria (APA, 1994).

(6) Jyväskylä Longitudinal Study of Personality and Social Development (JYLS). The Jyväskyla Longitudinal Study of Personality and Social Development is a study based on a cohort of 369 children born in 1959 in Finland who have been followed up since 1968 (Pulkkinen, 1982, 2006). Participants were randomly selected from the town centre and the suburbs of Jyväskyla. They were followed up at ages 8, 14, 27, 33, 36, and 42. Antisocial behavior was assessed using self-reports of offending as well as official conviction records

between ages 15 and 47. Based on Moffitt's (1993) developmental taxonomy, the following three groups of offenders were identified for the 123 males of the study: G1: adolescence-limited offenders (offences up to age 21), G2: adult-onset offenders (offences only after age 21), and G3: life-course-persistent offenders (offences before and after age 21) (Pulkkinen, Lyyra, & Kokko, 2009). Adult mental health outcomes were measured at age 42. Mental health was assessed using the 12-item GHQ (Goldberg, 1972), covering anxiety and depression. Depression was also measured using a 16-item depression scale shortened from the General Behavior Inventory (Depue, 1987). Anxiety was studied using an anxiety-related scale from the Karolinska Scales of Personality (af Klinteberg, Schalling, & Magnusson, 1990; Pulkkinen, Virtanen, af Klinteberg, & Magnusson, 2000).

(7) Lives Across Time: A longitudinal Study of Adolescent and Adult Development (LAT). The Lives Across Time study is an ongoing, multi-wave, panel design initiated in 1988. It is based on an initial sample of two adolescent cohorts consisting of 975 high school students (52% female, 48% male) recruited from two suburban public high school districts in Western New York. Students were assessed when they were in their 10th and 11th year of high school (average age 15.5 years) and followed up four times within the first two years and then again once more approximately 7 years after wave 4 (average age 23.8 years). Complete information for all five waves is available for 724 young adults. Self-reported delinquent behavior was assessed at each wave using seven items (including property damage, theft, and violence offences) from prior delinquency research (e.g., Elliot, Huizinga, & Menard, 1989). Based on this information, Wiesner and Windle (2004) identified six groups of delinquents using LGMM (Muthén & Muthén, 2000; Muthén & Shedden, 1999): G1: rare offenders, G2: moderate late peakers, G3: high late peakers, G4: decreasers, G5: moderate-level chronics, and G6: high-level chronics. Depression was measured during wave five, when participants were 23.8 years of age on average. The assessment of DSM-IV major depression disorder was based on the Composite International Diagnostic Interview (WHO, 1993). Additionally, serious depressive symptomatology was identified using the Center for Epidemiological Studies Depression Scale (Radloff, 1991).

(8) Mater-University of Queensland Study of Pregnancy (MUSP). The Mater-University of Queensland Study of Pregnancy is a longitudinal study initiated in 1981. From 1981 to 1984, approximately 8,458 pregnant women, attending their first clinic visit at the Mater Misericordiae Mothers' Hospital in Brisbane, Australia, were enrolled in the study. 7,223 mothers gave birth to a living child. Children were followed up when they were around the ages of 6 months, 5, 14, and 21 years old (Najman, Bor, O'Callaghan, Williams, Aird, &

Shuttlewood, 2005). Antisocial behavior was assessed at ages 5 and 14 using a 33-item short form of the Child Behavior Checklist (CBCL; Najman et al., 1997) and the Youth Self Report of the CBCL (Achenbach, 1991a, 1991b). Based on Moffitt's (1993) a priori classifications, children were classified into three antisocial subgroups: G1: childhood limited antisocials (antisocial at age 5 but not at age 14), G2: adolescence-onset antisocials (antisocial at age 14 but not at age 5), and G3: life-course-persistent antisocials (antisocial at ages 5 and 14) (McGee et al., 2011). Mental health outcomes were measured at age 21. Anxiety and depressive symptoms were assessed using the Young Adult Self-Report version of the CBCL anxiety/depression subscale (Achenbach, 1997).

(9) Oregon Youth Study (OYS). The Oregon Youth Study is an ongoing longitudinal study based on two cohorts of 102 and 104 boys recruited in 1983-84 and 1984-85 (Capaldi & Patterson, 1987). Study participants were selected from schools in higher crime areas of a medium sized metropolitan region in the Pacific Northwest in the USA. The boys were interviewed yearly. Self-reported offending behavior was assessed using the Elliott et al. Self-Reported Delinquency Scale (Elliott, Ageton, Huizinga, Knowles, & Canter, 1983) from ages 12-13 to 23-24. Based on this data, the following five offender trajectory groups were identified using LGMM (Muthén & Muthén, 2000; Muthén & Shedden, 1999): G1: rare offenders, G2: decreasing low-level offenders, G3: decreasing high-level offenders, G4: chronic low-level offenders, and G5: chronic high-level offenders (Wiesner, & Capaldi, 2003). Depressive symptoms were measured at ages 23-24 to 25-26. Symptoms were assessed using the Center for Epidemiological Studies Depression Scale (Radloff, 1991).

6.2.4 Plan of analysis

Data from individual studies was synthesized using the Comprehensive Meta-Analysis software (CMA; Borenstein, Hedges, Higgins, & Rothstein, 2005). The odds ratio (OR), with its 95% confidence interval (CI) is reported as an overall weighted average measure of effect size. The OR is a measure of association between an exposure and an outcome. It represents the odds that an outcome will occur given a particular exposure, compared to the odds of the outcome occurring in the absence of that exposure (Szumilas, 2010).

As considerable heterogeneity was expected between studies, the random effects computational model was used to yield an overall pooled mean effect size across studies as well as within subgroups (Borenstein, Hedges, & Rothstein, 2007). This approach takes into account that there may be multiple true effect sizes in the population and that heterogeneity around the average of those population effect sizes can be quantified and potentially explained

with measured study characteristics (Borenstein, Hedges, Higgins, & Rothstein, 2010; Tanner-Smith & Grant, 2018).

In a preliminary step, the mean of the combined effect sizes was calculated in studies where offender typologies were broken down into more detailed sub-subgroups (e.g., early versus intermediate onset AL offenders in Walker, Boden, Fergusson, & Horwood, 2019). Cochran's Q test (1954) was used to assess the heterogeneity of studies. A significant Q statistic rejects the null hypothesis of homogeneity and concludes that there is statistically significant between-study variation. Three indicators of publication bias were examined: funnel plots, Duval and Tweedie's trim and fill procedure, and Egger and colleagues' regression intercept (Borenstein, Hedges, Higgins, & Rothstein, 2009).

6.3 Results

6.3.1 Descriptive findings and assessment of methodological quality

An overview of the nine included primary studies is presented in Table 1. Studies originate mainly from English-speaking countries, including the United Kingdom, the United States of America, Australia, New Zealand, and Finland. All studies had a prospective design with self-reported mental health outcomes for different types of offenders.

The operationalisation of offending trajectories varied slightly between included studies. In six studies, it was based on self-reports of offending (Huesmann, Dubow, & Boxer, 2009; McGee et al., 2011; Odgers et al., 2008; Walker, Boden, Fergusson, & Horwood, 2019; Wiesner & Windle, 2006; Wiesner, Kim, & Capaldi, 2005), in one study offender groups were based on official records (Reising, Ttofi, Farrington, & Piquero, 2019b), and in the remaining two studies they derived from mixed self-reports and official records (Paradis, Koenen, Fitzmaurice, & Buka, 2016; Pulkkinen, Lyyra, & Kokko, 2009). Measures of self-reported and official antisocial behavior included aggression, delinquency, conduct problems, and offending. All studies developed an offender typology that followed Moffitt's (1993) dual taxonomy or used a very similar classification approach. In five studies, offender groups were determined conceptually (Huesmann, Dubow, & Boxer, 2009; McGee et al., 2011; Paradis, Koenen, Fitzmaurice, & Buka, 2016; Pulkkinen, Lyyra, & Kokko, 2009; Reising, Ttofi, Farrington, & Piquero, 2019b), and in four studies they were determined operationally (Odgers et al., 2008; Walker, Boden, Fergusson, & Horwood, 2019; Wiesner & Windle, 2006; Wiesner, Kim, & Capaldi, 2005). The number of offender groups varied between two and six, though most studies reported three offender subgroups.

Table 1. Primary studies included in the systematic review and/or meta-analysis.

	Author & Year	Country	Study	Outcome Measure	Reference Category[16]	CL /AL[17]	LO	LCP / Chronics[18]
1	Reising et al. 2019b	UK	CSDD	Depression (age 32)		OR = 1.62 (.766 to 3.42)	OR = 2.60 (1.06 to 6.38)	OR = 1.99 (.87 to 4.54)
				Anxiety (age 32)		OR = 1.51 (.694 to 3.29)	OR = 3.47 (1.45 to 8.30)	OR = 2.54 (1.13 to 5.68)
				Depression (age 48)		OR = 1.10 (.50 to 2.44)	OR = 4.16 (1.77 to 9.78)	OR = 1.25 (.51 to 3.11)
				Anxiety (age 48)		OR = .59 (.25 to 1.40)	OR = 2.64 (1.12 to 6.22)	OR = .76 (.29 to 1.98)
2	Walker et al. 2019	New Zealand	CHDS	Depression		OR = 1.90 (1.28 to 2.81)	OR = 3.0 (1.9 to 4.6)	OR = 3.0 (1.8 to 5.1)
				Anxiety		OR = 1.93 (1.25 to 2.97)	OR = 2.1 (1.3 to 3.3)	OR = 2.8 (1.6 to 4.8)
3	Paradis et al. 2016	USA	CPP	Mental health	M = 2.18 SD = 1.04	M = 2.34 SD = 1.11		M = 2.89 SD = 1.23
4	Huesmann et al. 2009	USA	CCLS	Depression	M= 50 SD= 7.8	M = 50.13 SD = 9.364	M = 54 SD = 10	M = 55 SD = 11

[16] This group contains non-offenders as well as low-risk or rare offenders which were used as a proxy to non-offenders when a non-offending category was not available.

[17] This group contains childhood- as well as adolescence-limited offenders.

[18] This group contains life-course persistent offenders as well as chronic offenders.

Table 1. (continued)

5	Odgers et al. 2008	New Zealand	Dunedin Study	Anxiety (females)		OR = 1.0 (.6 to 1.7)	OR = 1.0 (.6 to 1.8)	OR = 3.0 (1.4 to 6.1)
				Depression (females)		OR = 0.7 (.4 to 1.4)	OR = 1.0 (.6 to 1.9)	OR = 2.3 (1.1 to 4.9)
				Anxiety (males)		OR = 2.9 (1.6 to 5.3)	OR = 1.9 (.9 to 3.6)	OR = 4.3 (2.0 to 8.9)
				Depression (males)		OR = 1.1 (.5 to 1.4)	OR = 1.2 (.5 to 2.5)	OR = 3.7 (1.7 to 7.9)
6	Wiesner, & Windle 2006[19]	USA	LAT	Depression		OR = 1.94 (.85 to 4.41)	OR = 1.19 (.78 to 1.83)	OR = 1.51 (.91 to 2.49)
7	Pulkkinen et al. 2009[20]	Finland	JYLS	Anxiety, & Depression		OR = .43 (.02 to 9.97)	OR = 1.13 (.25 to 5.14)	OR = 2.59 (.88 to 7.57)
8	McGee 2011	Australia	MUSP	Mental Health (females)		OR = 1.70 (1.13 to 2.56)	OR = 1.60 (1.08 to 2.36)	OR = 3.50 (1.73 to 7.10)
				Mental Health (males)		OR = 1.00 (.80 to 3.10)	OR = 2.30 (1.42 to 3.74)	OR = 2.80 (1.38 to 5.70)
9	Wiesner et al. 2005	USA	OYS	Depression	M = -.46 SD = .76	M = -.02 SD = .98		M = .24 SD = 1.06

[19] Authors provided the OR and accompanying p-value. From the two-by-two frequency table we estimated the OR and accompanying 95% CI.

[20] Authors provided the OR and accompanying p-value. Based on this information we estimated the 95% CI from the OR and z-value.

All studies[21] identified a non-offender or low-risk group, a childhood or adolescence limited group, and a group of life-course-persistent offenders. Seven studies identified an additional group of late-onset offenders (Huesmann, Dubow, & Boxer, 2009; McGee et al., 2011; Odgers et al., 2008; Pulkkinen, Lyyra, & Kokko, 2009; Reising, Ttofi, Farrington, & Piquero, 2019b; Walker, Boden, Fergusson, & Horwood, 2019; Wiesner & Windle, 2006). Walker and colleagues (2019) reported two AL offender groups that varied in the timing of the onset of offending: early versus intermediate, and these were combined. Another study (Huesmann, Dubow, & Boxer, 2009) differentiated between LCP low and LCP high aggression, and these were combined. Similarly, another study differentiated between low-level and high-level offenders within the groups of chronic and adolescence-limited offenders (Wiesner, Kim, & Capaldi, 2005) and, again, these were combined. The same was done for the Lives Across Time Study (Wiesner & Windle, 2006) in which moderate-level and high-level offending were distinguished within LO and LCP offenders. For these studies where offender groups were portrayed in more detail, the mean of the combined effect sizes was calculated and presented in Table 1. All studies used data from nonoffender-based community samples. The average number of participants in the included studies was 1,810 (range: 206 to 7,223). Six out of nine studies (Huesmann, Dubow, & Boxer, 2009; McGee et al., 2011; Odgers et al., 2008; Paradis, Koenen, Fitzmaurice, & Buka, 2016; Walker, Boden, Fergusson, & Horwood, 2019; Wiesner & Windle, 2006) were based on samples including both females and males, while three studies (Pulkkinen, Lyyra, & Kokko, 2009; Reising, Ttofi, Farrington, & Piquero, 2019b; Wiesner, Kim, & Capaldi, 2005) comprised only males. The operationalisation of mental health outcomes varied between included studies. One study (Pulkkinen, Lyyra, & Kokko, 2009) had information on overall mental health (combined anxiety/depression) as well as separate measures, but the combined score was used because effect sizes on the depression outcome were not presented in the report. Three studies (Odgers et al., 2008; Reising, Ttofi, Farrington, & Piquero, 2019b; Walker, Boden, Fergusson, & Horwood, 2019) reported depression and anxiety separately, two studies (McGee et al., 2011; Paradis, Koenen, Fitzmaurice, & Buka, 2016) only reported overall mental health and another three studies (Huesmann, Dubow, & Boxer, 2009; Wiesner, & Windle, 2006; Wiesner, Kim, & Capaldi, 2005) only reported depressive symptoms.

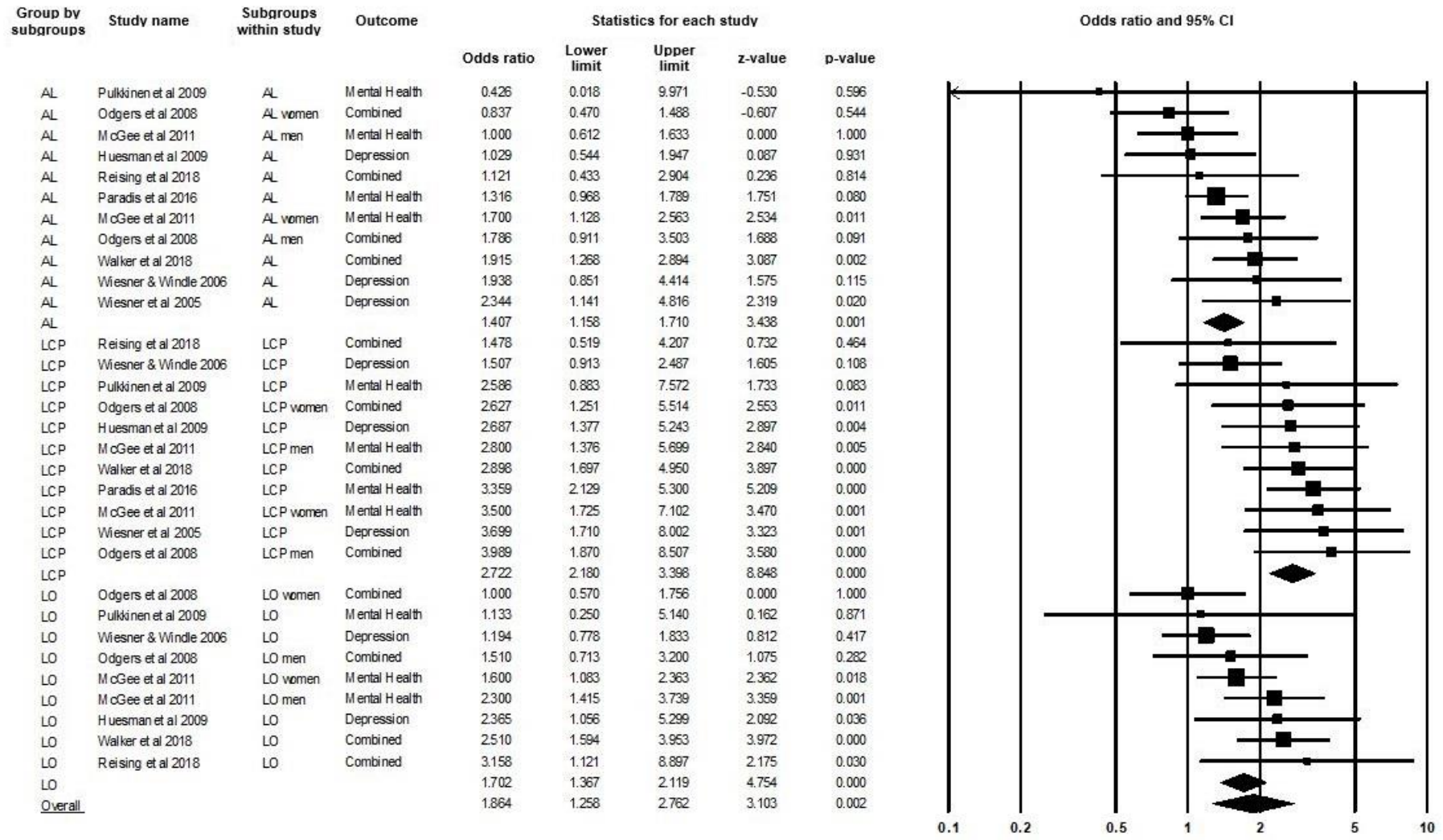
[21] Huesmann, Dubow and Boxer (2009) used the life-course-persistent low offender group as reference category.

6.3.2 Meta-analytical findings of the relationship between offender groups and mental health

Findings from the meta-analysis are presented in Figure 2 (forest plot). The final meta-analysis included nine studies. Effect sizes from individual studies are presented in the forest plot based on offender group membership. Within each offender group trajectory (i.e., AL, LO, and LCP), gender specific results are shown only if available within each longitudinal study (McGee et al., 2011; Odgers et al., 2008). The forest plot also presents the summary effect size within each offender trajectory as well as the overall summary effect size across all subgroups across studies (i.e., the overall average OR on the association between 'offending' and mental health). Although not shown in the forest plot, a significant positive association between offender group and mental health problems was established in 7 out of 9 studies included in this systematic review. Two studies (Pulkkinen, Lyyra, & Kokko, 2009; Reising, Ttofi, Farrington, & Piquero, 2019b) found a positive association (OR = 1.76, p = .190 and OR = 1.69, p = .080, respectively), but results were not statistically significant. Overall, three studies (Odgers et al., 2008; Reising, Ttofi, Farrington, & Piquero, 2019b; Wiesner, & Windle, 2006) yielded relatively small effect sizes ranging from OR = 1.39 to OR = 1.69. Four studies (Huesmann, Boxer, Dubow, & Smith, 2019; McGee et al 2011; Paradis, Koenen, Fitzmaurice, & Buka, 2016; Pulkkinen et al., 2008) yielded larger effect sizes, all of them with an odds ratio of almost 1.8. The strongest association between overall offending and mental health could be found in two reports by Walker and colleagues (2019; OR = 2.33, p < .001) and Wiesner and colleagues (2005; OR = 2.90, p <.001). Three of the reviewed studies (McGee et al., 2011; Paradis, Koenen, Fitzmaurice, & Buka, 2016; Walker, Boden, Fergusson, & Horwood, 2019) included a number of confounding factors or control variables (e.g., gender, prior history of depression and anxiety, individual, social, family, and childhood characteristics, as well as time-varying covariates). In almost all of these subgroup comparisons, the association between offending trajectory membership and mental health outcome remained statistically significant after adjusting for covariates.

These gender analyses showed a stronger association between offender group and mental health among men. However, trajectory group membership predicted poor mental health among both females and males and available results do not provide robust evidence for any gender differences in the association. A synthesis of the 9 independent samples provided an overall average odds ratio of 1.79 (CI: 1.57 to 2.04).

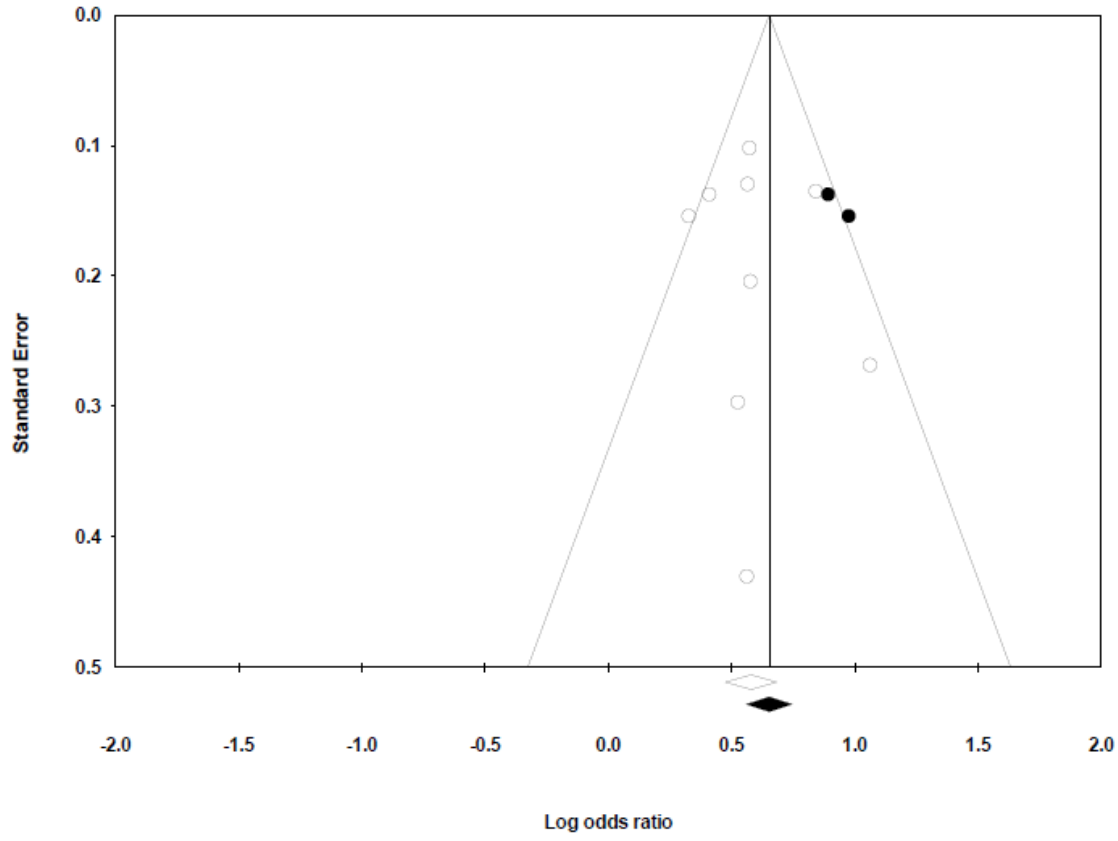
Figure 2. Forest plot of the results of the synthesised samples and subgroups.



Group by subgroups	Study name	Subgroups within study	Outcome	Odds ratio	Lower limit	Upper limit	z-value	p-value
AL	Pulkkinen et al 2009	AL	Mental Health	0.426	0.018	9.971	-0.530	0.596
AL	Odgers et al 2008	AL women	Combined	0.837	0.470	1.488	-0.607	0.544
AL	McGee et al 2011	AL men	Mental Health	1.000	0.612	1.633	0.000	1.000
AL	Huesman et al 2009	AL	Depression	1.029	0.544	1.947	0.087	0.931
AL	Reising et al 2018	AL	Combined	1.121	0.433	2.904	0.236	0.814
AL	Paradis et al 2016	AL	Mental Health	1.316	0.968	1.789	1.751	0.080
AL	McGee et al 2011	AL women	Mental Health	1.700	1.128	2.563	2.534	0.011
AL	Odgers et al 2008	AL men	Combined	1.786	0.911	3.503	1.688	0.091
AL	Walker et al 2018	AL	Combined	1.915	1.268	2.894	3.087	0.002
AL	Wiesner & Windle 2006	AL	Depression	1.938	0.851	4.414	1.575	0.115
AL	Wiesner et al 2005	AL	Depression	2.344	1.141	4.816	2.319	0.020
AL				1.407	1.158	1.710	3.438	0.001
LCP	Reising et al 2018	LCP	Combined	1.478	0.519	4.207	0.732	0.464
LCP	Wiesner & Windle 2006	LCP	Depression	1.507	0.913	2.487	1.605	0.108
LCP	Pulkkinen et al 2009	LCP	Mental Health	2.586	0.883	7.572	1.733	0.083
LCP	Odgers et al 2008	LCP women	Combined	2.627	1.251	5.514	2.553	0.011
LCP	Huesman et al 2009	LCP	Depression	2.687	1.377	5.243	2.897	0.004
LCP	McGee et al 2011	LCP men	Mental Health	2.800	1.376	5.699	2.840	0.005
LCP	Walker et al 2018	LCP	Combined	2.898	1.697	4.950	3.897	0.000
LCP	Paradis et al 2016	LCP	Mental Health	3.359	2.129	5.300	5.209	0.000
LCP	McGee et al 2011	LCP women	Mental Health	3.500	1.725	7.102	3.470	0.001
LCP	Wiesner et al 2005	LCP	Depression	3.699	1.710	8.002	3.323	0.001
LCP	Odgers et al 2008	LCP men	Combined	3.989	1.870	8.507	3.580	0.000
LCP				2.722	2.180	3.398	8.848	0.000
LO	Odgers et al 2008	LO women	Combined	1.000	0.570	1.756	0.000	1.000
LO	Pulkkinen et al 2009	LO	Mental Health	1.133	0.250	5.140	0.162	0.871
LO	Wiesner & Windle 2006	LO	Depression	1.194	0.778	1.833	0.812	0.417
LO	Odgers et al 2008	LO men	Combined	1.510	0.713	3.200	1.075	0.282
LO	McGee et al 2011	LO women	Mental Health	1.600	1.083	2.363	2.362	0.018
LO	McGee et al 2011	LO men	Mental Health	2.300	1.415	3.739	3.359	0.001
LO	Huesman et al 2009	LO	Depression	2.365	1.056	5.299	2.092	0.036
LO	Walker et al 2018	LO	Combined	2.510	1.594	3.953	3.972	0.000
LO	Reising et al 2018	LO	Combined	3.158	1.121	8.897	2.175	0.030
LO				1.702	1.367	2.119	4.754	0.000
Overall				1.864	1.258	2.762	3.103	0.002

Following the recommendations for interpretation by Sterne and Egger (2001), a funnel plot with imputed studies (see Figure 3) indicated relative symmetry in the included studies, thus suggesting that the established estimate is relatively comparable to the population effect. The observed studies are illustrated as open circles and the observed point estimate in log units is demonstrated as an open diamond. The imputed studies are shown as filled circles and the imputed point estimate in log units is shown as a filled diamond. Duval and Tweedie's (2000) trim and fill procedure indicated that there were no missing studies to the left of the mean, but two missing studies to the right of the mean. This shifted the overall estimate to 1.94 (CI: 1.68 to 2.23). The adjusted point estimate indicates a larger summary effect compared to that of the observed summary effect, indicating that the current overall summary effect size is an under-estimation of the association between mental health and crime. Following Egger and colleagues' (1997) regression test, the intercept was not significantly different from zero (b0 = 0.475, CI: -2.23 to 3.18), thereby indicating that the estimate was not influenced by potential publication bias.

Figure 3. Funnel plot of standard error by log odds ratio under the random effects model.



To test whether the association between offending and mental health varies from one offender group to another, subgroup analyses were conducted.[22] The summary effect size across studies for the AL subgroup was 1.41 (CI: 1.16 to 1.71), for subgroup LCP it was 2.72 (CI: 2.18 to 3.40), and for subgroup LO it was 1.70 (CI: 1.37 to 2.12). For all subgroups, the reference category was 'non-offenders' (see details on Table 1). The difference between groups (the combined effect for AL versus LCP versus LO) was statistically significant (Qbetween = 19.71, df = 2, $p < .001$), which indicates that the mean effect size significantly differed across groups. The analysis showed that the magnitude of the association between offender group membership and mental health outcome differed significantly between the three groups. Compared to non-offenders or low-risk offenders (which were used as a proxy to non-offenders when a non-offending category was not available in relevant reports; see Table 1), all offenders had an increased risk of poor mental health.

However, across all studies AL offenders had the lowest risk of developing mental health problems (OR = 1.41). LO offenders showed a slightly increased risk; they had almost twice the odds (OR = 1.70) of non-offending individuals to develop poor mental health. LCP offenders had the highest risk with nearly three times the odds (OR = 2.72) of developing symptoms of depression or anxiety compared to non-offenders.

6.4 Discussion

Although it has long been recognised that mental health problems are overrepresented in offenders – especially among those incarcerated – less is known about the temporal order of the association, specifically with regard to the extent to which offenders may face a heighten risk of adverse mental health later in life (Defoe, Farrington, & Loeber, 2013).

A number of studies has demonstrated that engagement in delinquent and antisocial behaviour during adolescence is an important marker for both physical and mental health during adulthood (e.g., Bardone et al., 1998), and this has been shown to be particularly true for those individuals with life-course persistent vulnerabilities (Odgers et al., 2008) and those with more severe offending patterns (Vaughn et al., 2011). Long-term engagement in

[22] Due to the smaller sample size in the Pulkkinen et al. (2009) report, confidence intervals were relatively wide. An additional subgroup analysis without the paper by Pulkkinen and colleagues yielded the following results: The summary effect size across studies for the AL subgroup was 1.37 (CI: 1.12 to 1.67), for subgroup LCP it was 2.65 (CI: 2.14 to 3.28), and for subgroup LO it was 1.80 (CI: 1.45 to 2.23). The difference between groups (the combined effect for AL versus LCP versus LO) was statistically significant (Qbetween = 19.64, df = 2, $p < .001$), which indicates that the mean effect size significantly differed across groups.

antisocial and delinquent behavior is thought to place youth at risk for a variety of negative life outcomes, including chronic mental health problems (Moffitt, 1993). Despite indications from earlier research, there has been no attempt to date to summarise the available evidence on mental health outcomes (i.e., anxiety and depression) for individuals with different criminal careers.

The current paper aimed to address this gap in the literature. Findings show that poor mental health and different offender typologies are significantly correlated with varying strengths of association across categories. This systematic literature review and meta-analysis provides robust evidence for a positive association between offending trajectory membership and poor mental health (i.e., anxiety and depression). Across all studies, being in one of the three offending subgroups significantly increased the odds of higher levels of mental health problems by 85.7%, compared to being classified as non-offender. Findings show that mental health problems are more strongly associated with being involved in offending over the life-course (LCP trajectory) or with being involved in offending at a later age (LO trajectory), than with being involved in delinquent behavior up to adolescence (AL trajectory). The average ages of onset for LCP and AL offenders are similar (Jolliffe, Farrington, Piquero, MacLeod, & van de Weijer, 2017b) although the two groups differ in degree of risk factors (Jolliffe, Farrington, Piquero, Loeber, & Hill, 2017a). It could be hypothesised that for AL offenders' desistance from crime is associated with more opportunities, better quality of life and positive mental health outcomes, so that these individuals, in the end, may present a profile similar to that of non-offenders. In contrast, for LCP offenders it may be plausible to assume that as risks and vulnerabilities accumulate over the life-course so do mental health problems. Further, it is possible that for LO offenders, the (larger) association between mental health and crime refers to the closer time-measurement between the two variables, suggesting that the effects of crime on mental health have not worn off. Notably, in almost all studies included in this review, this pattern of associations remained significant even after adjusting for demographic factors as well as childhood and adolescence life experiences. Thus, findings suggest that offender group membership has a unique contribution to the variance in mental health outcomes. However, it should be noted that the number of studies on which this finding is based is rather small.

6.4.1 Methodological quality

The methodological quality of the studies included in this review was relatively high and there was low risk of bias related to selection, representativeness, or measurement. All studies were based on relatively large samples drawn from the general population. Extra attention was paid to the comparability of offending trajectories across studies: the operationalisation of offending trajectories did not vary considerably between studies. Despite somewhat different operationalisations of anxiety and depression, findings across measures indicate that different conceptualisations do not matter much, which is an important observation for practice-based intervention efforts. Specifically, this paper's comprehensive systematic review has shown that although measures of anxiety and depression varied across studies, this did not affect the pattern of results (i.e., levels of mental health) across different offending trajectories, indicating that varying conceptualisation of mental states and/or traits lead to similar conclusions. This is an important point with great implications for policy and practice. In line with that, confidence intervals in the forest plot have been found to be non-overlapping across life-course conceptualisations, which also supports the above argument.

With regard to policy and practice, this this systematic review has highlighted the fact that different offenders have different mental health needs which need to be addressed with better intervention strategies. The variation in the estimated risk of adverse mental health outcomes across different offender groups may relative safely be attributed to the different offending typologies. The established positive association between offending groups and mental health problems has been shown to be consistent across samples, suggesting that findings have high external validity.

Both offending and mental disorders are relatively low prevalence phenomena. However, as all studies were based on large samples, they are assumed to have satisfactory statistical power for examining the relationship between these variables. Although most community and birth cohort studies are relatively large in sample size, they are typically too small to produce nationally representative profiles of the offending population. Regardless, findings from this review are consistent with cross-sectional and nationally representative studies on how mental health problems are associated differently with different typologies of offenders (Vaughn et al., 2011).

Similarly, the majority of studies included in this review examined mental health outcomes during mid-adulthood. Hence, follow-up periods for mental health problems between different offending groups varied considerably. While findings for LCP and LO

offenders were usually based on a very short time-lag (< 1 year), for almost all studies included (except reports by McGee et al., 2011 and Odgers et al., 2008), the follow-up periods for CL and AL offenders were much longer, with approximately 10 to 15 years, as these individuals typically desist from offending during late-adolescence or early-adulthood. From a conceptual and methodological perspective, it is important to choose more optimal time-lags in order to avoid bias when investigating long-term associations between offending group membership and mental health problems. A 1-year lag may lead to an underestimation of the actual impact (if there is a delayed effect of offending on mental health for instance). However, extremely long follow-up periods may introduce recall biases and can lead to an under- or overestimation of the association. Future research could address this methodological question by focusing on studies with multiple waves of both offending and mental health problems and by looking at within-individual analyses as they allow for safer causal inferences to be drawn (Murray, Farrington, & Eisner, 2009). Future studies should also investigate reciprocal effects: does offending cause mental health problems or vice versa? Very few studies to date have looked at alternative reciprocal models (e.g., Defoe, Farrington, & Loeber, 2013). Finally, analyses of publication bias have indicated that this kind of bias is most likely not present in this study.

6.4.2 Concluding remarks

As offending is generally associated with an increased risk of mental health problems, it is reasonable to assume that offenders with more (severe) offending trajectories experience more adverse mental health outcomes. This literature review and meta-analysis supports this hypothesis, as the majority of studies, as well as their synthesized estimates, demonstrated a positive association between offender group membership and subsequent mental health problems. The reviewed studies had high methodological quality and results were consistent across all nine studies. However, results of the meta-analysis may be treated with some caution due to the small number of studies included in the final model. A limitation of previous research is that most studies only examine the bivariate associations between offending and mental health problems. As such, there is a shortage of knowledge about third factors and potential confounders that may influence the association. This review has shown that offending group membership predicts mental health problems.

Although this finding is based on prospective longitudinal research, and all included studies measured offending trajectories before measuring mental health outcomes, it must be kept in mind, that the true temporal ordering of crime and mental health may not always be

given. This will be true for studies, that, for instance, did not measure and/or control for mental health status during early survey periods. It is important for future research to assess mental health status during the initial stage as well, in order to draw reliable conclusions about significant changes over time due to, for instance, involvement in criminal behaviour.

A challenge for future research in this field is to identify mediating and moderating variables that may explain how and when exposure to offending results in mental health problems. The findings of this review have some important implications for policy and practice. The established relationship between offending trajectories and mental health problems shows that a life-course-persistent delinquent lifestyle is likely to have detrimental consequences for an individual's mental health. Hence, findings support previous claims about offending being an important factor in in individuals' psycho-social health. Further, it is suggested that the development of more effective prevention and intervention programmes for offenders may also contribute to minimising mental health problems over the life-course. However, a more comprehensive understanding of the conditions and mechanisms, which can explain how and when offending is related to poor mental health, is needed in order to develop such interventions that may not only reduce LCP and LO offending but also improve mental health, and thereby promoting overall psychological wellbeing.

7 Paper II – The Impact of Longitudinal Offending Trajectories on Mental Health: Lifetime Consequences and Intergenerational Transfer[23]

7.1 Introduction

The aim of this paper was to investigate the association between offending trajectories and mental health outcomes specifically for the sample of males who have participated in the Cambridge Study in Delinquent Development. Recent research has moved further forward from solely describing features and risk factors of different offender groups and began to examine how offending trajectories themselves relate to life outcomes.

A few studies have provided a first valuable insight into various outcomes, independent of crime, that are correlated with previously identified distinct offending trajectories (e.g., Piquero, Daigle, Gibson, Piquero, & Tibbetts, 2007; Odgers, Caspi, Broadbent et al., 2007; Piquero, Shepherd, Shepherd, & Farrington, 2011). However, linking offending trajectories to distinct outcomes later in life has only been a topic of recent interest. Overall, very little is known about mental health outcomes for different offender groups. It is generally suggested that antisocial and criminal behaviour exert a detrimental effect on the mental health of individuals and their families and research has reported particularly high rates of anxiety and depression among them (see Section 4.4.2 and Section 4.4.3) However, the heterogeneity of offenders in this context has only been recognised recently and for the sample at hand no such analysis has been carried out yet.

Similarly, a long line of research has suggested that parental offending is associated with a range of offspring adverse outcomes (e.g., Murray & Farrington, 2008). However, little is known as to whether the intergenerational transmission of adverse outcomes is different for parents with different offending pathways. A better understanding of the patterns of offending underlying the age-crime curve has implications for policy and practice and will not only help to improve treatment of offenders, but also offer new opportunities for prevention and intervention regarding the familial transmission of mental health problems. This paper attempted to contribute to the literature by linking research into offending pathways with the study of longitudinal effects and intergenerational transmission of adverse mental health outcomes. It provides an insight into these topics by examining (1) the extent to which distinct

[23] This chapter is based on the published research paper: Reising, K., Ttofi, M. M., Farrington, D. P., & Piquero, A. R. (2019b). The impact of longitudinal offending trajectories on mental health: Lifetime consequences and intergenerational transfer. *Journal of Criminal Justice, 62,* 16–22.

offending trajectories relate to mental health outcomes in mid-adulthood and (2) the intergenerational continuity or discontinuity of offending behaviour and mental health problems and their interrelations.

7.1.1 Offender groups and mental health

The basis of this study's conceptualisation of offender groups is Moffit's developmental taxonomy (Moffitt, 1993). As outlined in more detailed in the previous chapter, by appreciating different constitutes of the aggregate age-crime curve, Moffitt has developed a dual taxonomy which proposes two distinct offender types: the adolescence-limited (AL) offender, who struggles with the effects of the maturity gap as alluded to above, and the life-course-persistent (LCP) offender, who offends throughout the life-course and who possesses a distinct psychopathology. More recent research has introduced the possibility of the existence of another offender group, namely the late-onset (LO) offender, who only commences offending in adulthood (McGee & Farrington, 2010). A more detailed description of Moffitt's developmental taxonomy can also be found in Section 6.1.

For decades, research has provided evidence that offenders face many adverse outcomes including, for instance, an increased risk of health-related problems and early death (Chassin, Piquero, Losoya, Mansion, & Schubert, 2013; Piquero et al., 2007, 2011). At the same time, however, research has primarily examined how risk factors affect different offender groups (e.g., Piquero, 2008), and has paid less attention to the fact that certain patterns of behavior and psychopathology may also be outcomes of distinctive offending pathways. Moffitt (2006) hypothesised that different offending pathways may bear differential risks for adult mental health. The literature review has indicated that there are only very few studies that have made specific predictions about health-related outcomes based on Moffitt's offender typology (e.g., Piquero, Farrington, Fontaine, Vincent, Coid, & Ullrich, 2012).

Using data from the Dunedin Multidisciplinary Health and Development Study, Moffitt, Caspi, Harrington, and Milne (2002), as well as Odgers and colleagues (2007), found that AL and LCP offenders had significantly higher levels of mental health problems than unclassified men, with LCP offenders experiencing more extreme symptoms. Similar results have been found by Piquero, Daigle, Gibson, Piquero, and Tibbetts (2007) for mental health outcomes of LCP and AL offenders in the National Collaborative Perinatal Project.

Capaldi (1992) suggested that early-onset offending could interfere with the development of important competencies, which may limit future opportunities in education

and work, and thereby make chronically antisocial individuals more vulnerable to mental health problems (see e.g., Laub & Sampson, 2001; Wiesner, Capaldi, & Patterson, 2003).

Insufficient involvement in conventional activities and relationships could indicate heighten stress and more adverse societal reactions (i.e., stigma), which have been shown to be important mechanisms in the development of internalising problems (Becker, 1963; Siennick, 2007). Further, Moffitt (1993) herself has conceptualised LCP offenders as having increased neuropsychological vulnerability ("life-course-persistent antisocial behavior is a form of psychopathology", p. 679), which could be an indication for the fact that LCP offenders have traits that are associated with an overall higher psychological vulnerability.

7.1.2 Intergenerational transmission

Offenders are not only more likely to face lifelong disadvantages themselves, but they may also have children who go on to experience similar difficulties. Research has suggested that parental offending is significantly associated with a range of offspring adverse outcomes (e.g., Capaldi, Pears, & Owen, 2008; Farrington, Ttofi, & Crago, 2017; Loeber et al., 2009). The specific process by which parents influence their children is described as intergenerational transmission. The family is a prime location for socialisation in the development of children's values, attitudes, and behavior patterns. As such it may be that parental offending interferes with family functioning and, together with adverse living circumstances and socialisation practices, may contribute to offspring internalising problems. Importantly, however, it may be that the intergenerational transmission of adverse outcomes is different for parents with different offending pathways. To date, there are only very few studies examining offspring outcomes over the life-course based on parental offender groups.

Using data from the CSDD and the Dutch Transfive Study, Besemer and Farrington (2012) found that the offspring of offenders showed significantly more offending behavior than the offspring of non-offenders. For the Stockholm Birth Cohort Study sample, a similar trend was found. Although children's convictions were only related to the fact that fathers had a conviction, but not to their father's offender group membership (Besemer, Axelsson, & Sarnecki, 2016).

Laub and Sampson (1988) hypothesised that parental offending operates through adverse parenting practices (e.g., neglectful or harsh parenting), which in turn has been shown to increase a child's risk of antisocial behaviour and delinquency (Smith & Farrington, 2004). Social learning theory suggests that children of parents with behavioural problems are likely

to replicate these behaviours if they are encouraged to do so or not effectively disciplined (Burgess & Akers, 1966). According to Merton's strain theory (1938) the children of offenders in disadvantaged environments (e.g., low SES, structurally disadvantaged neighbourhoods) may perceive crime as the only or most efficient way to achieve certain goals (i.e., an imbalance of desirable goals and available means).

Research has also shown that children of parents with mental disorders are at greater risk of developing internalising problems themselves. Several studies examining multi-generational mental health relationships have found significant associations between internalising problems across generations (Hancock, Mitrou, Shipley, Lawrence, & Zubrick, 2013; Johnston, Schurer, & Shields, 2011). One potential pathway for the transmission of mental health within the family unit may be through genetic mechanisms (Rutter, 2006). Additionally, it has been suggested that internalising problems of children may contribute to ineffective parenting practices (e.g., Conger, Ge, Elder, Lorenz, & Simons, 1994), which in turn may further increase children's risk of emotional and mental health problems (Laub & Sampson, 1988). Finally, children in more unstable living circumstances may be more likely to face certain major life events like taking over family responsibilities and other demands they may not yet be sufficiently prepared for (Wickrama, Conger, Wallace, & Elder, 2003). To date, research has been able to demonstrate the familial continuity of offending behavior as well as mental health problems. However, to the best of our knowledge, very few studies have distinguished between various developmental pathways of criminal behavior, and no study has examined offspring mental health (i.e., anxiety and/or depression) in relation to different parental offending trajectories.

7.1.3 Gender aspects

Previous research suggests that the familial continuity of certain forms of psychopathology may be more distinct in girls than in boys. Studies have shown consistent gender differences in the prevalence of internalising and externalising problems in the general population, with females being at heightened risk for internalising and males for externalising symptoms (see e.g., Zahn-Waxler, Shiftcliff, & Marceau, 2008 for a review). By drawing on conceptions of gender roles in Western societies, approaches to women's health offer explanations for these differences. Based on mechanisms by which socialisation processes may influence the experience and expression of mental health problems in women, it is suggested that females might not only be more likely to overinternalise their own and others'

problems, but may also be more likely to define their own experiences in psychiatric terms (e.g., Keenan & Shaw, 1997).

The main objective of this paper is to investigate the longitudinal and intergenerational impact of criminal behavior on mental health problems by testing the following hypotheses:

Offenders' mental health

(1) Early onset offenders (AL and LCP) have more mental health problems than those who commence offending in adulthood (LO).
(2) Persistent offenders (LCP) show more extreme symptoms regarding internalising problems.

Intergenerational transmission of mental health

(3) Fathers and offspring have similar mental health status.
(4) Paternal mental health has a stronger impact on daughters' internalising problems than on sons.

Offspring mental health by fathers offending pathway

(5) Offspring of adult offending fathers (LCP and LO) have increased mental health problems compared to offspring of AL offending fathers.
(6) Paternal crime has a stronger impact on daughters' internalising problems than on sons' internalising problems.

7.2 Methods

7.2.1 Sample

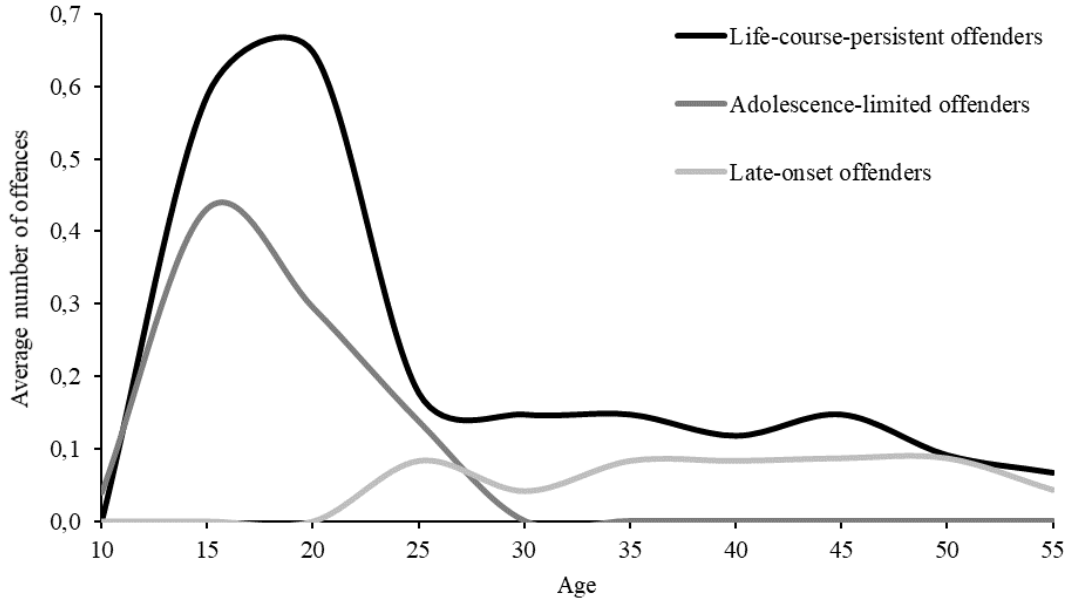
Hypotheses are tested using data from the Cambridge Study in Delinquent Development (CSDD), a prospective longitudinal study of the development of offending behavior among 411 males from South London who were born around 1953. At age 8, 94% of the boys could be classified as working-class, based on their fathers' occupation, and most described themselves as White and of British origin (87%). The majority of boys were living in traditional two-parent families (Farrington, 2003). Since 1961-62, the males have been studied at frequent intervals using a multi-informant approach (self-, parent-, teacher-, and peer-reports). Information has been obtained on individual, family, school, and social characteristics. Additionally, conviction and medical records have been studied (Farrington, Piquero, & Jennings, 2013). Between 2004 and 2007, the biological children of the original

study males were followed up, leading to interviews with 551 children (84.4% of those who were eligible) (Farrington, Ttofi, Crago, & Coid, 2015).

7.2.2 Measures

Criminal convictions. Convictions were counted if they were for standard list offences committed between ages 10 and 56, including minor offences such as shoplifting, as well as more serious offences ranging from robbery to sexual offences. The CSDD sample includes 253 fathers, of whom 112 (44.3%) committed an offence between the ages of 10 and 56. In previous analyses, distinct offender groups for study males were estimated based on Moffitt's (1993) taxonomy. The results of these analyses favoured a four-group solution including: non-convicted (NC – 55.7%), late-onset (LO – 9.8 %), adolescence-limited (AL – 20.7%), and life-course persistent (LCP – 13.8%) offenders (Jolliffe et al., 2017). LCP offenders were defined as those who committed their first offence before age 20 and then at least another offence at age 30 or later. Similarly, AL offenders were labelled as such if they committed their first offence before age 20 and their last offence before age 30. LO offenders were classified as those who only commenced offending at age 20 or later. Figure 4 shows the different age-crime curves for fathers'[24] offending groups over the life-course.

Figure 4. Age crime curves for fathers' offending groups.



Note. Smoothed line-graph based on authors' own calculations.

[24] In this study, "fathers" describes a subsample of the original study males, namely those who have a child of their own.

Depression and Anxiety. Symptoms of internalising problems were measured using the General Health Questionnaire (GHQ-30), which was designed to capture non-psychotic psychiatric disorders using 30 items in community samples (Goldberg, 1972). For the present study only the two depression and anxiety subscales were used, which were identified in previous analyses and highly congruent with those found in other studies (e.g., Huppert, Walter, & Day, 1989). A factor analysis yielded a four-item scale for depression (Likert scoring: 0 to 12; age 32 $\alpha = 0.86$, age 48 $\alpha = 0.87$) and a ten-item scale for anxiety (Likert scoring: 0 to 30; age 32 $\alpha = 0.92$, age 48 $\alpha = 0.94$).

7.2.3 Analytical approach

A three-stage analytical approach was used to investigate the longitudinal and intergenerational link between offending pathways and internalising problems. First, dichotomised mental health problems for each offender group were examined, using conditional odds ratios (OR) obtained from a series of separate logistic regression analyses. In a second step, offspring's and fathers' mental health status was compared, using logistic regression analyses. In the last step, offspring mental health was investigated across fathers' offender group classification using negative binomial regression analyses for skewed distributions (Byers, Allore, Gill, & Peduzzi, 2003). For the last two analyses, a generalised estimating equations (GEE) approach was applied to estimate overall relationships between variables over time, because analyses of family data require statistical techniques that take into account the shared variance of outcomes within families (i.e., children clustered within fathers) (Liang, & Zeger, 1986). GEE models are specified using an exchangeable correlation matrix, since it is more appropriate for clustering at the family level (Ballinger, 2004).

7.3 Results

7.3.1 Mental health problems per offender group

The first question concerned the extent to which fathers' offending pathways coincide with their mental health problems at ages 32 and 48. For further analyses, males were categorised into positive and negative cases for depression and anxiety, based on an approach that identified the 15% with the highest score as positive cases. For this study, the main interest was to examine individuals with clear symptoms. It was assumed that the positive group, made up of those 15% with the highest scores, was more likely to actually have symptoms of depression and/or anxiety.

Table 2. Mental health outcomes for different offender groups.

	NC		LO		AL		LCP		LO versus NC			AL versus NC			LCP versus NC		
	n	%	n	%	n	%	n	%	OR	p-value	90 % CI	OR	p-value	90 % CI	OR	p-value	90 % CI
D|A32	23	17.2	9	39.1	13	26.0	11	33.3	3.10	0.010	1.398 to 6.884	1.70	0.091	0.885 to 3.251	2.41	0.022	1.181 to 4.930
D|A48	31	23.5	10	47.6	11	22.0	7	21.9	2.96	0.013	1.339 to 6.553	0.92	0.416	0.477 to 1.770	0.91	0.456	0.418 to 1.990
D32	16	11.9	6	26.1	9	18.0	7	21.2	2.60	0.040	1.063 to 6.377	1.62	0.145	0.766 to 3.421	1.99	0.086	0.869 to 4.538
A32	15	11.2	7	30.4	8	16.0	8	24.2	3.47	0.010	1.453 to 8.296	1.51	0.756	0.694to 3.290	2.54	0.029	1.134 to 5.684
D48	17	12.9	8	38.1	7	14.0	5	15.6	4.16	0.003	1.772 to 9.778	1.10	0.421	0.497 to 2.438	1.25	0.342	0.506 to 3.105
A48	21	15.9	7	33.3	5	10.0	4	12.5	2.64	0.031	1.123 to 6.222	0.59	0.157	0.246 to 1.397	0.76	0.316	0.288 to 1.976

Note. NC = non-convicted, LO = late-onset offenders, AL = adolescence-limited offenders, LCP = life-course-persistent offenders.

D|A32 = either depressed or anxious at age 32, D|A48 = either depressed or anxious at age 48.

Cut off for depression and anxiety is top 15%.

Percentage (%) refers to number of males *with* mental health problems within offender subgroup.

Reference category for odds ratios is non-convicted study males.

One-tailed p-values and confidence intervals because of directional predictions; 90% CI = confidence interval.

The results, presented in Table 2, reveal that early and mid-adulthood symptoms of internalising problems were the highest among LO offenders (39.1% and 47.6%). LO offenders were significantly more likely than non-convicted fathers to show internalising problems (OR32 = 3.10, $p < .01$ and OR48 = 2.96, $p < .05$). Similarly, age 32 internalising problems were relatively more likely among LCP offenders compared to non-convicted males (OR32 = 2.41, $p < .05$). However, at age 48 LCP offenders did not show significantly higher levels of anxiety or depression (OR48 = 0.91, $p = .456$). AL offenders' mental health problems were not statistically significantly elevated (OR32 = 1.70, $p = .091$ and OR48 = .92, $p = .477$).

A closer look at the type of condition reveals that for LO offenders the most common mental health problem at age 32 was anxiety (30.4%), while at age 48 it was depression (38.1%). Compared to non-convicted males, being a LO offender is significantly associated with whether a father develops anxiety during early adulthood, OR32 = 3.47 ($p < 0.01$) and depression during mid-adulthood, OR48 = 4.16 ($p < .01$). Similarly, early adulthood depression (age 32: 26.1%) and symptoms of anxiety (33.3%) later in life at age 48 were also highest among LO offenders. A more detailed exploration of conditions for LCP offenders shows a similar pattern, with anxiety being more prevalent at age 32 (24.2%) and depression being more prevalent at age 48 (15.6%). LCP offenders had 2.54 times the odds ($p < .05$) of non-convicted males to develop anxiety during early adulthood.

7.3.2 Offspring mental health versus father mental health

In a next step it was investigated whether fathers' mental health status predicts offspring mental health. CSDD study males have 551 children (Mage = 25.5), of whom 291 (52.8%) are male and 260 (47.2%) are female. For reasons of comparability, the same classification approach was used to categorise offspring into positive and negative cases regarding their symptoms of depression and anxiety. The results of the relationship between paternal and offspring mental health symptoms are presented in Table 3.

Overall, the GEE models reveal that the children of anxious or depressed fathers have an increased risk of developing internalising problems. However, the results show only marginal trends towards significance. Even though more than one-fifth (21.4%) of children with depressed fathers at age 32 showed higher levels of depression, they were not significantly more likely than children with non-case fathers (14.1%) to develop depression, OR32 = 1.66, $p = .066$. Similarly, children of age 48 depressed fathers (21.6%) do not have a statistically significant increased risk to develop depression (OR48 = 1.69, $p = .070$).

Table 3. Impact of fathers' mental health status on offspring internalising symptoms.

	Fathers' status								Odds Ratio					
	Age 32				Age 48				Age 32			Age 48		
	case		no-case		case		no-case		case vs no-case			case vs no-case		
	n	%	n	%	n	%	n	%	OR	p-value	90 % CI	OR	p-value	90 % CI
% depressed or anxious														
Total	112	26.8	425	20.7	121	23.1	401	21.2	1.38	.092	.927 to 2.067	1.12	.341	.715 to 1.744
Sons	55	29.1	230	19.1	62	21.0	209	20.6	1.71	.056	.982 to 2.965	1.02	.478	.545 to 1.917
Daughters	57	24.6	195	22.6	59	25.4	192	21.9	1.13	.367	.628 to 2.031	1.20	.307	.669 to 2.134
% depressed														
Total	70	21.4	467	14.1	74	21.6	448	14.1	1.66	066	.956 to 2.876	1.69	.070	.941 to 3.020
Sons	37	24.3	248	13.7	37	27.0	234	13.7	2.03	.047	1.012 to 4.060	2.33	.031	1.105 to 4.928
Daughters	33	18.2	219	14.6	37	16.2	214	14.5	1.27	.329	.526 to 3.049	1.15	.400	.469 to 2.811
% anxious														
Total	77	20.8	460	14.3	74	21.6	448	13.8	1.56	.072	.947 to 2.587	1.72	.054	.989 to 3.002
Sons	36	13.9	249	12.4	39	12.8	232	12.1	1.17	.371	.533 to 2.566	1.15	.381	.540 to 2.450
Daughters	41	26.8	211	16.6	35	31.4	216	15.7	1.95	.057	.976 to 3.896	2.38	.019	1.201 to 4.722

Note. Number (n) refers to *total* number of children within fathers' mental health status.

Percentage (%) refers to number of children *with* symptoms within fathers' mental health status.

Cut off for depression and anxiety is top 15%.

One-tailed p-values and confidence intervals; 90% CI = confidence interval.

The same pattern can be found for anxiety. Children of anxious fathers (20.8% and 21.6%) are not statistically significantly more likely than their counterparts with non-case fathers (14.3% and 13.8%) to develop anxiety (OR32 = 1.57, p = .072; OR48 = 1.72, p = .054).

However, when GEE models are estimated for sons and daughters separately, analyses reveal interesting differences. Paternal depression seems to primarily effect sons' mental health, while paternal anxiety effects daughters' mental health. Sons of fathers with early and mid-adulthood depression had more than twice the odds of sons with non-case fathers to develop depression themselves (OR32 = 2.03, $p < .05$ and OR48 = 2.33, $p < .05$). A similar pattern is found for daughters' anxiety. Daughters with fathers who are classified as anxious at age 32 had almost twice the odds to also develop anxiety (OR32 = 1.95, p = .057), while those with age 48 anxious fathers had 2.38 times the odds of daughters with non-case fathers to develop anxiety (OR48 = 2.38, $p < .05$).

7.3.3 Offspring mental health versus father offender group

The last step examines whether fathers' offending pathways predict offspring mental health. Overall, the results in Table 4 show that, compared to non-offending fathers, offending fathers had higher proportions of children with anxiety or depression. Nearly one-fifth (18.0%) of the children of LO offenders were children with depression during early adulthood. The proportion of depressed children among AL offenders was similarly high, with 16.1% of all children showing symptoms. Interestingly, LCP offenders had a relatively small proportion of children with symptoms of depression (12.1%), even smaller than non-convicted fathers (14.5%).

Looking separately at sons and daughters, the results showed that LO and LCP offenders had a higher proportion of depressed daughters (25.0% and 16.2%), while AL offenders had a higher proportion of depressed sons (21.7%). Among non-convicted fathers, there was no difference in the proportions of depressed sons and daughters.

The highest proportion of children with anxiety symptoms is found among LCP offenders (18.2%). This is followed by AL offenders of whom 16.9% had children with anxiety. The proportion of anxious children among LO offenders was slightly smaller (14.0%) and does not significantly differ from the proportion of anxious children among non-convicted fathers (13.9%). Non-convicted fathers had equal proportions of anxious sons and

daughters (13.7% and 14.1%). For all other offender groups, the proportion of anxious daughters was significantly higher than the proportion of anxious sons.

Table 4. Fathers' offender group versus offspring depression and anxiety.

	NC		LO		AL		LCP		LO versus NC			AL versus NC			LCP versus NC		
	n	%	n	%	n	%	n	%	OR	p-value	90 % CI	OR	p-value	90 % CI	OR	p-value	90 % CI
% depressed or anxious																	
Total	303	20.5	50	22.0	118	25.4	66	19.7	1.13	.380	.585 to 2.185	1.34	.129	.874 to 2.064	.95	.439	.538 to 1.673
Sons	168	20.2	22	9.1	60	26.7	29	17.2	.41	.125	.111 to 1.472	1.45	.153	.798 to 2.631	.83	.360	.355 to 1.943
Dtrs.	135	20.7	28	32.1	58	24.1	37	21.6	1.87	.105	.822 to 4.692	1.25	.272	.688 to 2.253	1.07	.447	.491 to 2.312
% depressed																	
Total	303	14.5	50	18.0	118	16.1	66	12.1	.99	.483	.623 to 1.568	1.08	.353	.769 to 1.520	.88	.338	.529 to 1.461
Sons	168	14.3	22	9.1	60	21.7	29	6.9	.42	.030	.193 to .899	1.36	.129	.870 to 2.125	.67	.197	.306 to 1.452
Dtrs.	135	14.8	28	25.0	58	10.3	37	16.2	1.44	.149	.812 to 2.524	.83	.272	.508 to 1.366	1.09	.415	.578 to 2.041
% anxious																	
Total	303	13.9	50	14.0	118	16.9	66	18.2	.95	.362	.759 to 1.195	1.08	.166	.948 to 1.230	1.12	.133	.946 to 1.332
Sons	168	13.7	22	0.0	60	11.7	29	17.2	.72	.014	.560 to .918	.93	.273	.765 to 1.130	1.05	.382	.807 to 1.364
Dtrs.	135	14.1	28	25.0	58	22.4	37	18.9	1.15	.228	.848 to 1.552	1.22	.026	1.032 to 1.449	1.18	.122	.934 to 1.496

Note: NC = non-convicted, LO = late-onset offenders, AL = adolescence-limited offenders, LCP = life-course-persistent offenders; Dtrs = Daughters.

Number (n) refers to *total* number of children within fathers' offender group.

Percentage (%) refers to number of children *with symptoms* within fathers' offender group.

Reference category in GEE analyses (odds ratios) is non-convicted.

One-tailed p-values and confidence intervals; 90% CI = confidence interval.

7.4 Discussion

This paper set out to contribute to the literature by linking research into offending pathways with the study of longitudinal effects and intergenerational transmission of mental health by using data from two generations of the CSDD.

7.4.1 Offender's mental health

Our analysis of offenders' mental health reveals two interesting and important findings. First, in contrast to previous research, symptoms of depression and anxiety were not highest among early-onset offenders (LCP and AL), but among those who only commenced offending in adulthood (LO). This is particularly interesting, since the analysis of childhood features has suggested that this group approaches the transition into adulthood with less severe challenges and more resources[25]. However, Arnett's (2000) concept of "emerging adulthood" offers a possible explanation by proposing another "maturity-gap" for young adults (ages 18 to 29), similar to those of adolescents, in which life transitions and experiences (i.e., identity exploration, instability, a sense of broad possibilities) may relate to adult-onset offending through mechanisms similar to those of the traditional maturity gap.

Our second finding points to a developmental sequence of mental health problems among persistent offenders (i.e., early-adulthood anxiety, mid-adulthood depression). It might be that chronically antisocial individuals have always experienced internalising problems, which for LO offenders, for instance, may have played a role in delaying criminal behavior until adulthood (Zara & Farrington, 2009). However, even when this protective effect of anxiety wears off with age, the symptoms may remain present during early adulthood. Early internalising problems could also be related to later symptoms of depression, in sense that individuals may find themselves unprepared to cope with the difficulties of adulthood, and those with chronic antisocial behavior may be more vulnerable to depression (Capaldi, 1992; Defoe, Farrington, & Loeber, 2013).

7.4.2 Intergenerational transmission of mental health

The findings of our second analysis are broadly consistent with other studies that have demonstrated the familial continuity of mental health. Overall, children of fathers with mental health problems were at greater risk for developing internalising problems themselves. The

[25] This observation is based on previous (unpublished) analyses of childhood features conducted during the course of my studies.

potential pathways may include genetic mechanisms, parenting practices, and family circumstances that limit future prospects (Laub & Sampson, 1988; Rutter, 2006;).

7.4.3 Offspring mental health of offending fathers

In line with current research, the findings of our third analysis demonstrate an overall effect of paternal offending on children's mental health, with a higher percentage of symptomatic daughters than sons. Generally, offspring mental health seems to be related to fathers' criminality but not particularly to their offender group. The results reveal gender differences in internalising problems, with the daughters of offending fathers being slightly more at risk for mental health problems than the sons. Approaches to women's health suggest that early problems in the children of offenders may be channelled into predominantly internalising problems for girls relative to boys, since parents may be generally more accepting of, for instance, fearful and withdrawn behavior in girls. Zahn-Waxler, Cole, and Barrett (1991) have hypothesised that, due to early-life socialisation of empathy in girls, exposure to chronic distress of others may lead to an over-internalisation of their own and others' problems and thereby shape girls' problem behavior into an internalized form. Interestingly, although findings indicate that persistent offenders are at risk for poor mental health, for which a strong intergenerational transmission has been found, their sons are significantly less likely to develop internalising problems. In line with assumptions about gendered socialisation practices, it may be that early problems in boys are rather channelled into externalising forms.

7.4.4 Limitations and future directions

It is important to note a few limitations of this study: First, the numbers of offending parents were relatively small. Due to extremely small numbers of convicted mothers, intergenerational transmission was solely assessed based on paternal measures. Second, offending pathways were estimated using official records, which only capture a fraction of the true number of offences committed and may thereby have affected the composition of offender groups. Third, the GHQ-30 is not a clinically standardised instrument to detect mental health problems. Therefore, individuals may not always have been successfully identified. Furthermore, it should be mentioned that the age span of the G3 sample was fairly wide, ranging from 18 to 38 years. In the above-mentioned analyses, the age of the G3 sample was not controlled for. This is a factor that should be considered in subsequent analyses, as the children's age could affect both, the link to the fathers' mental health and criminal offending as well as their own offending behaviour. It may be that the effect of parental

behaviour wears off with age, depending on, for instance, the number of years individuals have lived independently and away from the family home. Additionally, it can be assumed that older individuals have had more chances to commit crimes compared to younger individuals, simply due to the fact that they have lived longer. Subsequent analyses should control for the age of the G3 sample, in order to compare only individuals of the same age and to further rule out that associations are spurious.

Despite these limitations, the current study contributes to the literature by being the first to date to investigate the intergenerational transmission of mental health (i.e., anxiety and/or depression) based on fathers' offending pathways. A more thorough understanding of the heterogeneity of offenders is essential for policy and practice. This is particularly important concerning the extent to which some individuals with distinct offending pathways experience adverse health outcomes. It is suggested that future research should further examine adult offenders, particularly LO offenders, who are often neglected in criminological research; they have been shown to not only face a variety of adverse outcomes themselves, but are also very likely to have children with distinct patterns of internalising problems over the life-course.

8 Paper III – Childhood Risk Factors for Personality Disorder Symptoms related to Violence[26]

8.1 Introduction

The aim of this paper was to investigate the relations between childhood risk factors, adult personality disorders and violence convictions. Criminal justice and mental health professionals have long believed that individuals with certain personality disorders pose an increased risk of violence. Personality disorders are more prevalent in offender populations than in the general population and are associated with multiple social and behavioural problems (e.g., Coid, 2003). Although research has indicated that personality disorders have their origins in the early years of life, little is known about childhood factors which may help to better understand the development of specific personality disorders in adulthood. The aim of this paper was (1) to investigate the associations between violent offending over the life-course and adult personality disorder symptoms in a community sample and (2) to identify childhood antecedents, including individual, familial and socio-economic characteristics of specific adult personality disorders. The goal of this study, in investigating the associations between childhood adversity, personality disorders and violence, are firstly to help social scientists and mental health professionals to identify vulnerable children at an early stage of development, and secondly to provide the basis for more effective preventive and correctional treatment programmes.

As outlined in the previous chapters, the overall prevalence of personality disorders in prisons and secure mental health facilities is much higher than in the general population (see Section 4.4.4). The most commonly reported diagnosis is antisocial personality disorder, followed by moderate to high rates of borderline, narcissistic, and paranoid personality disorders. Further, research has shown that there is substantial comorbidity between personality disorders, specifically between antisocial and borderline diagnoses. This comorbidity has been found to be strongly associated with the severity of violence (e.g., Howard, Khalifa, & Duggan, 2014).

Violence is believed to be more common in people with personality disorders. As multiple studies have demonstrated a high prevalence of personality disorders in offenders in

[26] This chapter is based on the published research paper: Reising, K., Farrington, D. P., Ttofi, M. M., Piquero, A. R., & Coid, J. W. (2019). Childhood risk factors for personality disorder symptoms related to violence. *Aggression and Violent Behavior*, *49*, 101315.

general and in violent offenders in particular, many current approaches to clinical risk assessment have established that personality disorder needs to be considered as part of a comprehensive assessment and formulation of risk (Royal College of Psychiatrists, 2016)

However, Lowenstein, Purvis, and Rose (2016) have highlighted the complexity of the relationship between personality disorders and violence and concluded that there was considerable inconsistency in assessing the influence of personality disorder diagnoses on the risk of violence. There is similar inconsistency in assessing childhood antecedents of adult personality disorders. Potential risk factors for specific personality disorders have received only little research attention so far. Mental health professionals generally agree that personality disorders have their roots in childhood and adolescence (APA, 2013), but there is little specific information on prospectively assessed risk factors for personality disorders (Newton-Howes, Clark, & Chanen, 2015; De Clercq & De Fruyt, 2007).

Using data from the Children in the Community Study, Cohen (2008) reported that negative childhood experiences predicted personality disorders ten years later. Available studies indicate that maladaptive family functioning and parenting, as well as low socio-economic status and early disruptive disorders (specifically conduct disorder, impulsivity, and hyperactivity), are strong long-term predictors of most personality disorders (Cohen, 2008; Cohen, Crawford, Johnson, & Kasen, 2005; Johnson, Cohen, Chen, Kasan, & Brook, 2006; Widom, Czaja, & Paris, 2009; Winograd, Cohen, & Chen, 2008). Coid (1999) observed that the individual and social background in early life may substantially predict later personality disorder development.

However, it is largely unknown whether specific forms of childhood adversity are associated with different personality disorders (Baglivio, Wolff, Piquero, Greenwald, & Epps, 2017). Current literature reveals a number of conceptual and methodological limitations which call for further exploration of the link between childhood risk factors, personality disorders, and violence (Duggan, & Howard, 2009; Dunne, Gilbert, & Daffern, 2018; Lowenstein, Purvis, & Rose, 2016). As previously discussed (see Section 4.5), most studies have investigated selected clinical and offender samples, and few longitudinal studies of crime include measures of personality disorders (Brennan, Grekin, & Vanman, 2000). Those that do have measures, often use personality disorders as a single combined category (Putkonen, Komulainen, Virkkunen, Eronen, & Lönnqvist, 2003; Wallace et al., 1998), or have exclusively focused on antisocial or borderline personality disorders (Coid, 2005; Eronen, Hakola, & Tiihonen, 1996; Hodgins, Mednick, Brennan, Schulsinger, & Engberg,

1996). Few studies have investigated the specific association between personality disorders and violent offending, but instead have used a general measure of crime (Coid, 2005; Keeney, Festinger, Marlowe, Kirby, & Platt, 1997).

To our knowledge, only two other studies have previously investigated the relationship between particular personality disorder categories and violent offending in a community-based, longitudinal study, namely Johnson and colleagues (2000) in a sample of adolescence from New York and Coid and colleagues (2017) in a national household sample from Britain. The present study used data from the Cambridge Study in Delinquent Development (CSDD), which is a prospective longitudinal study of 411 males from South London who were regularly interviewed between ages 8 and 48. In this sample, childhood risk factors were assessed, along with DSM-IV personality disorders and violence convictions.

This paper begins with a brief introduction to the concept of personality disorders and a brief review of recent research on the association between childhood risk factors, personality disorders, and violence, before investigating the relationship between personality disorders and violence convictions over the life-course. Following this, it investigates childhood risk factors for those personality disorders that are associated with lifetime violence convictions. Theories and evaluations suggest that successfully treating offenders who display both personality disorders and criminogenic needs is challenging. Hence, the aim of this study is to better understand the relationship between childhood risk factors, personality disorders, and violence, in order to aid criminal justice and mental health professionals in developing more effective intervention and treatment programs and to avoid the potentially inaccurate labelling of individuals as dangerous based on only a diagnosis of personality disorder.

8.1.1 Personality disorders and violence

Although the study of human personality goes back at least to antiquity (Tyrer et al., 2007), the concept of personality disorders is much more recent. In 1923, Schneider formulated a list of psychopathic personalities, which still form the basis of current classifications of personality disorders in ICD-10 (WHO, 1992) and to a lesser extent in the DSM-5 (APA, 2003). The definition of personality disorders in this this paper is based on the conceptualisations in these two major classification systems, specifically the diagnostic evaluation is based on the Structured Clinical Interview for DSM-IV (First, Spitzer, Gibbon, Williams, & Benjamin, 1996). For a more detailed description of personality disorders see Section 2.2.4.

Violence has been identified as a substantial public health problem by the WHO (Krug & Dahlberg, 2006). The most recent official statistics on police-recorded crime in England and Wales, the context for the current study, show that there were approximately 1.3 million recorded violent crimes in the preceding 12 months (Office for National Statistics, 2018). As outlined in more detail in Section 3.2.2, a violent crime is a criminal act in which an individual uses or threatens to use force upon another person, with some degree of wilfulness to cause physical or serious psychological harm (see also Blackburn, 1993; Douglas, Hart, Webster, & Belfrage, 2013; Dunne, Gilbert, & Daffern, 2018).

Violence is believed to be more common in people with personality disorders. Findings consistently reveal higher rates of aggressive and violent behavior in offenders with personality disorders (e.g., Blackburn & Coid, 1999; Duggan & Howard, 2009; Dunne, Gilbert, & Daffern, 2018; Logan, & Blackburn, 2009). Johnson and colleagues (2000), for instance, have demonstrated that individuals diagnosed with a cluster A (i.e., paranoid, schizoid, schizotypal) or cluster B (i.e., antisocial, borderline, histrionic, narcissistic) were approximately three times more likely to engage in violence than those without any symptoms.

Over the past years, personality disorders have become a central criterion in many of the current approaches to violence risk assessment (Logan & Johnstone, 2010; Douglas, Hart, Webster, & Belfrage, 2013). This is largely because research has shown a high prevalence of personality disorders among offenders in general (Alwin, Blackburn, Davidson, Hilton, Logan, & Shine, 2006), and in individuals convicted of violent crimes in particular (Coid, 2002; Duggan & Howard, 2009; Gilbert & Daffern, 2011; McMurran & Howard, 2009). Evidence for a relationship between personality disorders and violence has also emerged from community-based research. Using data from a longitudinal community study, Johnson and colleagues (2000) found that individuals diagnosed with cluster A or B personality disorder were three times more likely to commit a violent act. A similar conclusion was drawn by Yu and colleagues (2012) whose systematic review and meta-analysis revealed a threefold increase in the odds of violence in individuals with a personality disorder. However, their results also show that the association between personality disorders and violence varies by personality disorder category. The authors found that a diagnosis of antisocial personality disorder was particularly related to violent offending (OR = 12.8; Yu, Geddes, & Fazel, 2012; see also Roberts & Coid, 2009). Further, research has shown that the comorbidity of antisocial and borderline personality disorders is strongly associated with violence (Freestone, Howard, Coid, & Ullrich, 2012; Howard, Khalifa, & Duggan, 2014). However, a few studies have

indicated that associations may be explained by co-occurring alcohol dependence, anxiety disorders or early childhood conduct disorder (e.g., Freestone, Howard, Coid & Ullrich, 2012). These findings stress the importance of examining specific personality disorder categories and symptoms.

Cluster A and violence. Research indicates that violent behaviour is less likely in individuals with cluster A personality disorders but may be more extreme when it occurs (Coid, 1998; Esbec & Echeburua, 2010; Johnson et al., 2000). While paranoid and schizoid personality disorders have been shown to be associated with increased numbers of crimes against the person (Coid, 1998; Keeney, Festinger, Marlowe, Kirby, & Platt, 1997; Roberts & Coid, 2009), schizotypal personality disorder is mainly associated with criminal damage and arson (Roberts & Coid, 2009). Cluster A personality disorders are characterised by low self-esteem and serious difficulties in forming and maintaining interpersonal relationships. Individuals with cluster A disorders are often described as distrustful and having a tendency to attribute behaviours to disposition (Ross, 1977; Novaco, 2010; Seidel et al., 2013). They often lack social skills, which is likely to generate rejection and isolation, which in turn may precipitate violence (Stone, 1996). Violence in the context of cluster A disorders appears to be emotionally driven (de Barros, 2008), which supports the assumption that it may be mediated by difficulties in emotion regulation and feelings of humiliation and shame (Scott, 2014). The literature indicates that individuals with Cluster A personality disorders are likely to commit violent acts because of their distorted interpretations of others' behaviours and messages (Coid, 2005; Girolamo & Reich, 1996).

Cluster B and violence. Cluster B personality disorders are most strongly associated with violent crimes, and this seems to be particularly true of antisocial and borderline personality disorders (Johnson et al., 2000). Roberts and Coid (2009) found that conduct and antisocial personality disorders were significantly related to most offending categories, while associations with borderline personality disorder and offending could mainly be explained by its high comorbidity with antisocial personality disorder. Narcissistic personality disorder is associated with increased numbers of crimes against the person (Keeney, Festinger, Marlowe, Kirby, & Platt, 1997), including homicide (Coid, 1998), and with fraud, drug offences, and arson (Roberts & Coid, 2009). Violence by individuals with histrionic personality disorder is less likely and seems mainly to occur when there is a comorbidity with antisocial or narcissistic personality disorders (Esbec & Echeburua, 2010).

Research shows that violence in the context of antisocial personality disorder may be explained by a lack of empathy (Cunha & Goncalves, 2013), a severe incapacity to observe social norms, high impulsivity (James & Seager, 2006) and the absence of positive perspectives about the future (Ciubara et al., 2016). While violence associated with antisocial personality disorder has been classified primarily as proactive, violence associated with borderline personality disorder is more reactive. Individuals with borderline personality disorder are characterised by poor identity and a lack of empathy, which may precipitate interpersonal difficulties (Day, Mohr, Howells, Gerace, & Lim, 2012; Seidel et al., 2013). Deep emotional suffering, affective instability, and trait impulsivity are important risk factors for physical aggression and violence in individuals with borderline personality disorder (Coid, Yang, Tyrer, Roberts, & Ullrich, 2006; Duggan, & Howard, 2009; Fossati et al., 2007). Violence in the context of borderline personality disorder is hypothesised to be more reactive and a means of relieving tensions (Coid et al., 2006a; Duggan & Howard, 2009). It appears to be emotionally driven (de Barros, 2008), which supports the assumption that it may be mediated by difficulties in emotion regulation (Scott, 2014).

Individuals with narcissistic personality disorder have a strong need for admiration and are very sensitive about rejection. Violence by these individuals is often considered to be a response to an injury to their ego (Baumeister, Bushman, & Campbell, 2000; Keulen-de Vos et al., 2014; Nestor, 2002). Ullrich, Keers, and Coid (2014) found that the experience of grandiose delusions together with anger can present a direct pathway to serious violence. Additionally, narcissistic personality disorder is often associated with a lack of empathy, which means that these individuals tend to give priority to their desires over the needs and rights of others (Fisher, & Hall, 2011; Logan, 2009; Stone, 2005; see also Jolliffe & Farrington, 2004). As mentioned above, histrionic personality disorder is rarely associated with violence. Only its co-occurrence with, for instance, antisocial personality disorder could be linked to offending. Ciubara and colleagues (2016) hypothesised that violence in histrionic individuals is caused by their hypersensitivity and their tendency to ascribe “catastrophic importance to common events” (p. 270).

Cluster C and violence. Cluster C is less frequently associated with offending behavior. Roberts and Coid (2009) found only weak associations between avoidant personality disorder and criminal damage, as well as between dependent or obsessive-compulsive personality disorder and offending. Violence by people in these personality disorder categories is very rare. Avoidant personality disorder is characterised by a lack of self-confidence and feelings of inadequacy. These individuals tend to be hypersensitive

towards criticism and rejection, which often causes interpersonal difficulties. Hence, violence in the context of avoidant personality disorder could either be a means to relieve tensions when individuals feel that their emotional needs are not understood, or as a kind of revenge against people who rejected them (Esbec, 1999). Similarly, individuals with dependent personality disorder tend to have strong feelings of insecurity and dependence on other people. It is hypothesised that abandonment may leave them feeling hopeless to such a degree that they become prone to use violence against other people or themselves (Duggan & Howard, 2009). Violence in obsessive-compulsive individuals is particularly rare but may appear when they experience episodes of lack of control and accumulated anger because of emotional suffering caused by hypersensitivity regarding humiliation and failure (Coid, 2005; Esbec, 2006).

8.1.2 Risk factors for personality disorder

Although little is known about childhood antecedents of particular adult personality disorders, it is well recognised that certain factors seem to increase the risk of developing personality disorders (Benjamin, 1996; Millon & Davis, 1996). Studies by Coid (2003) and Johnson, Cohen, Brown, Smailes, and Bernstein (1999) have shown that individual factors and early-life stressors can influence personality dysfunction and result in violent behavior in adult life. A better understanding of the factors that have the potential to explain why some children develop more stable forms of personality disorder, while others do not, will allow mental health professionals to better identify vulnerable children and to offer needs-oriented prevention programs (De Clercq & De Fruyt, 2007).

Research has shown that negative and traumatic childhood experiences are associated with a wide range of adult personality disorders (Hengartner, Müller, Rodgers, Rössler, & Ajdacic-Gross, 2013; Ullrich & Marneros, 2007; Weeks & Widom 1998). Offenders who are diagnosed with personality disorder have retrospectively reported a number of adverse childhood experiences, including an unstable and abusive family life, school problems, frequent victimization, and early behavioural problems (Bebbington et al., 2004; Bielas et al., 2016; Fox, Perez, Cass, Baglivio, & Epps, 2015; Johnson, Cohen, Brown, Smailes, & Bernstein, 1999; Joyce et al., 2003; Roberts, Yang, Zhang, & Coid, 2008; Ullrich & Marneros, 2007).

It is likely that many of these factors are associated with more than one personality disorder. In their analysis of cluster A personality disorders, Roberts, Yang, Zhang, and Coid (2008) found that childhood solitariness, a lack of parental affection, and emotional abuse

were associated with paranoid and schizoid personality disorders (see also Bernstein, & Fink, 1998). High levels of childhood sexual and physical abuse have generally been retrospectively reported by individuals with cluster B personality disorders (Horowitz, Widom, McLaughlin, & White, 2001; Luntz, & Widom, 1994; McLean, & Gallop, 2003; Roberts, Yang, Zhang, & Coid, 2008). Individuals with antisocial personality disorder have reported multiple types of childhood adversity, including parental neglect, lack of affection and harsh discipline, early behavioural problems such as conduct disorder, and criminality among family and peers, as well as low educational attainment (Armstrong, & Kelly, 2008; Berenz et al., 2013; Bernstein & Fink, 1998; Coid et al., 2006a; Hill, 2005; Roberts, Yang, Zhang, & Coid, 2008). Individuals diagnosed with borderline personality disorder retrospectively reported high and severe rates of emotional and sexual abuse, as well as increased parental loss and neglect (McLean, & Gallop, 2003; Ogata et al., 1990; Paris, Zweig-Frank, & Guzder, 1994a, 1994b; Roberts, Yang, Zhang, & Coid, 2008). Histrionic personality disorder shows strong associations with a history of victimization through abuse and bullying, as well as with parental mental health problems (Roberts, Yang, Zhang, & Coid, 2008). Narcissistic individuals were more likely to report family dysfunction, including parental criminality, neglect, and lack of affection (Roberts, Yang, Zhang, & Coid, 2008). Cluster C personality disorders are also particularly associated with parental neglect and lack of affection. Individuals with avoidant personality disorder reported high levels of childhood solitariness, parental neglect (Johnson, Cohen, Brown, Smailes, & Bernstein, 1999), low peer engagement (Rettew et al., 2003), and bullying victimization (Roberts, Yang, Zhang, & Coid, 2008). Dependent personality disorder is associated with family instability, a lack of affection and poor supervision (Drake, Adler, & Vaillant, 1988). A history of parental neglect and emotional, as well as sexual abuse, has been shown to be associated with obsessive-compulsive personality disorder (Battle et al., 2004; Roberts, Yang, Zhang, & Coid, 2008).

The current literature suggests that the high prevalence of personality disorders, particularly antisocial and borderline personality disorders, among violent offenders may be a result of their exposure to childhood traumatic experiences, including family dysfunction and breakdown, parental neglect and physical as well as emotional abuse (Gibbon, Ferriter, & Duggan, 2009; Johnson, Cohen, Brown, Smailes, & Bernstein, 1999; Spataro, Mullen, Burgess, Wells, & Moss, 2004). However, these conclusions are mainly based on retrospective reports that may have been biased by the knowledge of later outcomes.

Paris (2001) found that the rate of family breakdown in individuals with personality disorder was greater than in the general community. Similarly, Yen and colleagues (2002) and

Golier and colleagues (2003) highlighted that individuals with severe personality disorders were more likely to report interpersonal trauma and childhood physical abuse than those with other disorders. A rare longitudinal study found that personality disorders were more than four times as likely to be diagnosed in individuals with documented childhood abuse or neglect (Johnson, Cohen, Brown, Smailes, & Bernstein, 1999). Research has demonstrated that individuals who experience interpersonal trauma in childhood are at increased risk for psychiatric disorders, such as depression and anxiety disorders (Ford, Elhai, Ruggiero, & Frueh, 2009), substance abuse (Dube et al., 2006; Strine et al., 2012), and personality disorders (Ford, 2005; Yen et al., 2002). Exposure to childhood trauma tends to be associated with emotional dysregulation, which may influence many psychiatric conditions, including anxiety and mood disorders, as well as the development of personality disorders (McLeod, Natale, & Johnson, 2015; Van Dijke et al., 2010a, 2010b, 2011). Overall, it may be concluded that maltreated children are at increased risk of developing internalising disorders, such as personality disorders, but most studies are retrospective rather than prospective. The current study extends this line of research by exploring these linkages to adult offending patterns in middle adulthood.

8.2 Methods

8.2.1 Sample

Like the previous paper (see Chapter 7), this paper is based on data from Cambridge Study in Delinquent Development (CSDD). The CSDD is a prospective longitudinal study of the origins and development of offending and antisocial behavior in 411 males from South London. The males were recruited in 1961-62 by selecting all boys (ages 8 or 9) on the registers of six state primary schools (Farrington, 2003; Farrington, Piquero, & Jennings, 2013). The socioeconomic background of the sample is predominantly white (87%) and working class (94%). Since 1961-62, the males have been assessed nine times using a multi-informant approach (self-, parent-, teacher-, and peer-reports). Information has been obtained on individual, family, school, and social characteristics. Additionally, conviction records have been studied up to age 61 (Farrington, 2019). At age 48, jointly directed by David P. Farrington and Jeremy W. Coid, the study males completed a medical interview which was conducted by a trained psychiatrist and included the Structural Clinical Interview for DSM-IV personality Disorders (SCID-II; First, Spitzer, Gibbon, Williams, & Benjamin, 1996). According to the most up-to-date criminal records, 178 of the original study males (44.1%) were convicted up to age 61. Convictions were counted for more serious offences recorded in

the Police National Computer, excluding motoring offences (for a more detailed description of the criminal acts see Section 3.2).

8.2.2 Measures

Personality disorders. At age 48, 365 of the 394 males who were still alive (93%) completed a social interview, and 304 of the 365 (83%) also completed a medical interview[27]. As mentioned, personality disorders were identified at age 48 using the Structured Clinical Interview for DSM-IV personality disorders (SCID-II; First, Spitzer, Gibbon, Williams, & Benjamin, 1996). The semi-structured SCID-II interview was conducted by a trained psychiatrist and included 148 questions. Symptoms were rated as "absent", "sub-threshold" or "pathological". The sum of these ratings provided a score for each specific personality disorder.

Since symptoms can cause significant impairment to an individual even when they are below the diagnostic threshold (Gotlib, Lewinsohn, & Seeley, 1995), it has often been argued that a dimensional rather than categorical representation of personality disorders may be useful (Widiger, Simonsen, Krueger, Livesley, & Verheul, 2005). With this in mind, the ten categories of the DSM-IV (APA, 1994) personality disorders, including childhood conduct disorder, which is a strong prognostic indicator for some of the personality disorders, yielded scores of numbers of symptoms, and cut-off points were chosen to identify approximately the 20% with the most symptoms. Hence, it should be noted that personality disorder categories in this study do not represent medical diagnoses but rather the presence of at least one or two symptoms of the particular personality disorder.

Childhood risk factors. From all information collected in the interviews and questionnaires at ages 8 to 10, 20 risk factors were identified that covered three domains of the early family life of the males: environmental and socioeconomic adversity, family and parenting factors, and individual characteristics.

[27] Males were only included in the analysis if they completed the medical interview at age 48. A comparison between the analytic sample (n = 304) and the 105 males who did not take part in the interview but for who conviction data up to age 48 was available showed no significant difference regarding previous violence convictions. On average, males who did not take part in the age 48 medical interview were more likely to have a violence conviction (20.0%) compared to males who completed the interview (16.1%). However, this difference did not represent a significant effect with an overall odd ratio of 1.30 (p = 0.909).

Environmental and socioeconomic adversity included background factors such as low family income, poor housing, large family size, and low social class. Low family income and poor housing were rated by the psychiatric social workers who interviewed the parents. Generally, poor housing referred to living in houses that were very old and in a state of dilapidation. A large family indicated that the study male lived with four or more other children at the time of his tenth birthday. Low social class referred to fathers who had an unskilled manual job.

Family factors included age of parents, parental convictions and nervousness, harsh discipline and poor supervision, parental conflict, and a disrupted family. Parents were identified as young mothers or fathers when they had their first child before ages 21 or 23, respectively. Information about mothers' and fathers' convictions was obtained from criminal record searches up to age 32, when most of the boys were under age 10. Nervousness was based on social worker ratings and psychiatric treatment. The mother's assessment was additionally based on the Mother's Health Questionnaire (Gibson, Hanson, & West, 1967). Harsh discipline identified those study males whose parents applied disciplinary measures such as beating or smacking or had a cold neglecting attitude. Harsh discipline at age 10 was based on social worker assessments, as was poor parental supervision, which referred to the extent to which the parents knew about the boy's whereabouts. A disrupted family referred to boys who were not living with a biological parent at age 10. Parental conflict was also rated by the social workers based on their interviews with the parents, and it referred to chronic tension or disagreement in many fields, raging conflicts or estrangement.

Individual factors included low nonverbal and verbal IQ, low attainment, high daring, high impulsivity, and high hyperactivity. Low nonverbal IQ (90 or less) was measured using the Progressive Matrices test, while low verbal IQ was based on verbal comprehension and vocabulary tests completed at ages 8 and 10, respectively. Low attainment was based on school records of arithmetic, English and verbal reasoning tests completed by the study males at age 10-11. High daring was rated by parents and peers, and identified boys who took many risks in, for instance, traffic and climbing. High impulsivity was based on the boy's score on three psychomotor tests (Porteus Maze test, Spiral Maze test, and Tapping test). High hyperactivity was based on teacher and peer ratings of whether the boy (at age 8) lacked concentration or was restless in class.

Convictions for violence. Information about the males' violence convictions from ages 10 to 61 were based on searches of criminal records in the central Criminal Record

Office (National Identification Bureau) and the Police National Computer. Convictions analysed in this study were limited to violence convictions only, which included convictions for robbery, assault, threatening behavior, and possessing an offensive weapon. Because of the rarity of violence in the Cambridge Study (Piquero, Farrington, & Blumstein, 2007), this measure was dichotomised into at least one conviction for violence versus no violence convictions; 76 males (18.6% of 409 at risk from age 10) were convicted of violence[28]. Several searches of criminal records were conducted between 1964 and 2017.

8.2.3 Analytical approach

Data analysis in this study involved two stages. First, associations between personality disorders and violence were assessed, then childhood socio-economic, family, and individual background factors were studied as predictors of personality disorders associated with violence.

A primary aim of the statistical analysis was to establish the association between categorical personality disorders and violence convictions. Odds ratios (ORs) with one-tailed p-values (because of directional predictions) were calculated between categories of personality disorder, using the cut-off point of at least one or two symptoms versus the remainder, and violence. In the second step, childhood risk factors were studied for those personality disorders that were related to violence, again using ORs. The association between childhood antecedents and categorical personality disorder scores was then tested using logistic regression analyses. ORs were estimated using a forward stepwise method in order to minimise problems of multicollinearity (see Appendix Table B).

In a final step, Receiver Operating Characteristic (ROC) curve analyses were conducted using risk scores to predict dichotomous outcomes such as violence convictions and the prevalence of a personality disorder. A ROC curve is a graphical plot showing the performance of a classification model at different classification thresholds (Altman & Bland, 1994; Zweig & Campbell, 1993). This curve plots two parameters: the true positive rate and

[28] Out of those 76 males, 70 received a first conviction for violent offending before age 48. Only six males were convicted for violence for the first time after age 48. Two of those were not included in the analysis because they did not take part in the age 48 interview. Due to the small number of first-time violence convictions after age 48 we have combined information on retrospective and prospective occurrences. Similarly, males were not counted as not at risk of offending during incarcerated periods. This was partly because they could still commit offenses and also because these time periods were relatively short for CSDD males: Only three males served a total of more than 3.5 years in institutions (see also Farrington, 2019).

the false positive rate. The area under the ROC curve (AUC) is considered one of the best measures of predictive efficiency in these kinds of comparisons (e.g., Farrington, Jolliffe, & Johnstone, 2008; Zweig & Campbell, 1993). The AUC provides an aggregate measure of performance across all possible classification thresholds and ranges in value from 0 to 1 (Hanley & McNeil, 1982). A model which predictions are 100% wrong has an AUC of 0.0 and a model which predictions are 100% correct has an AUC of 1.0. The higher the AUC, the better is the model at predicting. Analyses were conducted using the Statistical Package for Social Sciences (SPSS) version 25.0 (SPSS Inc, 2017).

8.3 Results

Table 5 shows the prevalence of personality disorders. Among the sample of 304 men, the mean personality disorder scores were: obsessive-compulsive = 1.18, schizoid = 1.0, conduct = 0.85, narcissistic = 0.47, antisocial = 0.39, avoidant = 0.37, paranoid = 0.27, dependent = 0.26, borderline = 0.22, schizotypal = 0.21, and histrionic = 0.14. However, these scores are not comparable as the number of symptoms for each disorder varied from 3 to 8 (see Table 5).

The criteria for categorising an individual as a "case" were the presence of at least one symptom for avoidant, dependent, paranoid, schizotypal, histrionic, narcissistic, borderline, and antisocial personality disorders, and two or more symptoms for obsessive, schizoid, and conduct personality disorders. Correlational analyses revealed some associations among personality disorder scores. Altogether, 23 out of 55 possible correlations were statistically significant. The highest correlations of 0.52 were found between antisocial and conduct disorder and between antisocial and borderline disorders. Schizoid and schizotypal disorders (r = 0.46) and avoidant and dependent disorders (r = 0.41) also had relatively strong associations.

Overall, the prevalence of any personality disorder category was 77.0%[29] for the analytic sample (n = 304). Half of all those identified as having a disorder were identified as having one (23.9%) or two (26.1%) disorders. Roughly 31.6% of all study males showed comorbidity of either three or four personality disorders. The remainder (18.4%) of those with any disorder showed signs of multiple personality disorders (i.e., more than four personality disorders).

[29] The prevalence of 77% of any personality disorder category seems rather high for a community sample, which is attributable to focusing on one or more symptoms rather than formal diagnoses.

Table 5. Summary statistics for DSM-IV personality disorder scores.

	Dimensional Score			Cases	
	Mean	SD	Range	n	%
Cluster A	1.47	1.85	0-10	116	38.2
Paranoid	0.27	0.61	0-3	59	19.4
Schizoid	1.00	1.31	0-7	69	22.7
Schizotypal	0.21	0.52	0-3	50	16.4
Cluster B	2.07	3.01	0-15	151	49.7
Conduct	0.85	1.53	0-8	62	20.4
Antisocial	0.39	0.92	0-5	64	21.1
Borderline	0.22	0.72	0-5	37	12.2
Histrionic	0.14	0.42	0-3	34	11.2
Narcissistic	0.47	0.86	0-6	92	30.3
Cluster C	1.81	1.87	0-10	152	50.0
Avoidant	0.37	1.04	0-7	53	17.4
Dependent	0.26	0.61	0-4	59	19.4
Obsessive-Compulsive	1.18	1.24	0-6	105	34.5
Overall	5.35	4.65	0-27	234	77.0

Note. N = 304

The most prevalent personality disorder categories were obsessive-compulsive (34.5%), narcissistic (30.3%), schizoid (22.7%), and conduct or antisocial (20.4% and 21.1%, respectively). The most prevalent disorder, obsessive-compulsive, was one of the few that had relatively little comorbidity, with 20.0% who exclusively showed symptoms of obsessive-compulsive personality disorder. Borderline personality disorder was one of the disorders that showed a particular high co-occurrence with other categories (94.6% of borderline cases were comorbid with at least two other categories and 70.3% with at least four other categories). The most frequent disorders that were comorbid with borderline were antisocial (67.6%), narcissistic (64.9%), conduct (59.5%), and paranoid (56.8%). Similarly, 88.1% of all males with paranoid symptoms also showed symptoms of at least one other personality disorder. The largest overlap was between paranoid and narcissistic (55.9%) and paranoid and obsessive-compulsive (52.5%). For 82.8% of all males, symptoms of antisocial personality

disorder coexisted with at least one other category. The most frequent categories that were comorbid with antisocial personality disorder were conduct (57.8%) and narcissistic (53.1%). Most males (80.0%) with schizotypal symptoms had co-occurring symptoms of at least one other personality disorder, and 72.0% of all schizotypal cases had symptoms of schizoid personality disorder.

8.3.1 Association between personality disorders and violence

Table 6 presents relationships between specific personality disorders and violence for the study males who completed the medical interview at age 48. The prevalence of violence convictions in this sample of 304 males was 17.4% (n = 53). Seven of the eleven personality disorders were significantly associated with lifetime violence convictions (one negatively). The strongest association was found between cluster B and violence (OR = 9.14), especially for those with symptoms of antisocial (OR = 14.89), borderline (OR = 7.23), or conduct disorder (OR = 5.16). Males who showed symptoms of narcissistic personality disorder had 2.45 times the odds of those without any narcissistic symptoms of having a conviction for violence.

The odds of violence among males with symptoms of cluster A personality disorders were more than twice as high as for those with only few or no symptoms (OR = 2.50). Males with symptoms of paranoid or schizotypal personality disorder were significantly more likely to have official records for violence (OR = 1.86 and OR = 1.88). Cluster C (fear and anxiety) personality disorders were not significantly related to violence convictions. Interestingly, only the analysis of obsessive-compulsive personality disorder revealed a statistically significant, but negative, association. The odds of violence among males with symptoms of obsessive-compulsive personality disorder were 50.0% less than among males with only one or no symptoms (OR = 0.50).

Table 6. Relations between personality disorders and convictions for violent crime.

Personality Disorders (%)	% NR	% R	OR	p
Cluster A	12.2	25.9	2.50	0.001
Paranoid (19.4)	15.5	25.4	1.86	0.037
Schizoid (22.7)	15.7	23.2	1.62	0.077
Schizotypal (16.4)	15.7	26.0	1.88	0.042
Cluster B	4.6	30.5	9.14	< 0.001
Conduct (20.4)	11.6	40.3	5.16	< 0.001

Antisocial (21.1)	7.5	54.7	14.89	< 0.001
Borderline (12.2)	12.7	51.4	7.23	< 0.001
Histrionic (11.2)	17.4	17.6	1.02	0.486
Narcissistic (30.3)	13.2	27.2	2.45	0.002
Cluster C	17.8	17.1	0.96	0.440
Avoidant (17.4)	17.9	15.1	0.81	0.311
Dependent (19.4)	15.9	23.7	1.64	0.079
Obsessive-compulsive (34.5)	20.6	11.4	0.50	0.024
Overall	5.7	20.9	4.37	0.003

Note. % NR – percentage violent in non-risk category; % R – percentage violent in risk category; OR – odds ratio; p – one-tailed 95% significance level; N = 304.

Table 7 shows that the percentage of males who were convicted for violent offences increased with the number of comorbid personality disorders (AUC = 0.71, $p < 0.001$). Males with one or two comorbid personality disorders compared to males without any symptoms were more likely to have received a violence conviction during their life (OR = 1.89). Males with three or four comorbid personality disorder symptoms had 6.54 times the odds ($p < 0.01$) of those without any personality disorder symptoms to have at least one violence conviction. The odds of violence among males with more than four comorbid symptoms were 9.78 times those of males without any violence conviction. This difference was highly significant ($p < 0.001$).

Table 7. Personality disorder risk scores versus violence convictions.

Number of PDs	n (violence)	n (total)	% (yes)
	Prevalence of Violence Convictions		
0	4	70	5.7
1	6	56	10.7
2	6	61	9.8
3	11	37	29.7
4	10	37	27.0
5 or more	16	43	37.2
Total	53	303	17.5

AUC = 0.712, $p < 0.001$

8.3.2 Associations between childhood risk factors and adult personality disorders

Tables 8 and 9 show childhood risk factors for the males in all personality disorder categories that significantly predicted violence. The results show that several of the family and individual factors predicted symptoms of personality disorders. Cluster A and B personality disorder symptoms were predicted by several family, socio-economic, and individual factors. However, only three family and individual factors significantly predicted the cluster C disorders.

Table 8. Childhood risk factors predicting Cluster B personality disorders (univariate analysis, only significant results).

	Borderline				Conduct				Antisocial			
Risk factor	% NR	% R	OR	p	% NR	% R	OR	p	% NR	% R	OR	p
Socio-economic												
low family income	10.2	19.1	2.08	0.026	16.2	35.3	2.83	<0.001	17.5	33.8	2.42	0.002
large family size	10.2	19.2	2.14	0.020	16.2	34.3	2.72	<0.001	17.5	34.3	2.55	0.001
poor housing	9.3	16.7	1.95	0.029	14.8	29.2	2.38	0.001	16.9	27.5	1.86	0.014
low social class	10.0	22.2	2.56	0.008	17.3	35.2	2.60	0.002	18.5	33.3	2.21	0.009
Family												
convicted father	10.4	18.9	1.98	0.038	16.7	34.4	2.61	0.001	15.9	40.6	3.62	<0.001
convicted mother	-	-	-	-	18.4	44.0	3.50	0.002	19.4	40.0	2.77	0.010
young mother	9.9	17.0	1.86	0.040	-	-	-	-	17.8	28.0	1.79	0.022
nervous mother	-	-	-	-	-	-	-	-	16.9	29.8	2.08	0.007
harsh discipline	-	-	-	-	15.3	33.8	2.82	<0.001	18.7	27.5	1.65	0.051
poor supervision	10.0	23.6	2.77	0.004	15.3	38.2	3.42	<0.001	16.6	38.2	3.10	<0.001
parental conflict	-	-	-	-	17.0	33.3	2.45	0.003	-	-	-	-
disrupted family	10.0	20.0	2.23	0.017	16.4	35.4	2.79	<0.001	18.1	32.3	2.16	0.007
Individual												
low non-verbal IQ	-	-	-	-	16.4	32.5	2.46	0.002	-	-	-	-
low-verbal IQ	-	-	-	-	-	-	-	-	18.0	31.9	2.14	0.006
low attainment	-	-	-	-	-	-	-	-	17.8	29.7	1.95	0.020
high daring	-	-	-	-	16.3	30.4	2.25	0.003	14.4	37.0	3.50	<0.001
high impulsivity	-	-	-	-	15.1	35.9	3.15	<0.001	18.7	28.2	1.71	0.039
high hyperactivity	-	-	-	-	18.1	30.0	1.94	0.022	18.1	33.3	2.26	0.005

Note. None of the 20 childhood risk factors was significantly related to narcissistic personality disorder. % NR – percentage violent in non-risk category; % R – percentage violent in risk category; OR – odds ratio; p – one-tailed 95% significance level.

Table 9. Childhood risk factors predicting Cluster A and C personality disorders (univariate analysis, only significant results).

	Paranoid				Schizotypal				Dependent				Obsessive-Compulsive			
Risk factor	% NR	% R	OR	p	% NR	% R	OR	p	% NR	% R	OR	p	% NR	% R	OR	p
Socio-economic																
low family income	17.5	26.5	1.70	0.050	14.5	23.5	1.82	0.040	-	-	-	-	-	-	-	-
large family size	17.5	28.8	2.04	0.012	14. 5	27.4	2.52	0.003	-	-	-	-	-	-	-	-
low social class	17.6	27.8	1.79	0.046	14.5	25.9	2.07	0.022	-	-	-	-	-	-	-	-
Family																
convicted father	-	-	-	-	-	-	-	-	18.8	21.9	1.21	0.030	24.6	14.4	0.52	0.021
young father	16.9	27.4	1.86	0.032	-	-	-	-	-	-	-	-	-	-	-	-
harsh discipline	-	-	-	-	13. 9	25.0	2.07	0.013	-	-	-	-	-	-	-	-
poor supervision	-	-	-		14.0	27.3	2.31	0.010	-	-	-	-	-	-	-	-
Individual																
low non-verbal IQ	-	-	-	-	13.7	24.7	2.06	0.014	16.4	28.6	2.04	0.011	27.9	16.5	0.51	0.015
low-verbal IQ	-	-	-	-	13.6	26.4	2.28	0.007	17.1	26.4	1.74	0.042	26.5	15.3	0.50	0.017
high daring	14.8	30.4	2.51	0.001	-	-	-	-	-	-	-	-	-	-	-	-

Note. % NR – percentage violent in non-risk category; % R – percentage violent in risk category; OR – odds ratio; p – one-tailed 95% significance level.

For cluster B, many of the childhood risk factors significantly predicted a high likelihood of symptoms of conduct and antisocial personality disorder. For example, having a convicted parent, living in a disrupted family with poor supervision and harsh discipline, or being affected by poor housing, low family income, large family size and low social class all predicted a significantly increased likelihood of showing symptoms of conduct and antisocial personality disorder symptoms later in life. On an individual-level, childhood hyperactivity, impulsivity, and daring behavior significantly predicted symptoms of conduct and antisocial personality disorder. Males with conduct disorder were more likely to have a low non-verbal IQ, while those with symptoms of antisocial personality disorders scored lower on educational attainment. Males who grew up in a disrupted family and those who lacked supervision had an increased likelihood of showing symptoms of borderline personality disorder. These cases were more likely to have a convicted father or a very young mother and to come from a low-income family affected by poor housing. None of the odds ratios that measured the association between childhood risk factors and narcissistic personality disorder symptoms reached significance.

As seen in Table 9, Cluster A symptoms for paranoid and schizotypal personality disorders were found to be significantly predicted by the men's family socio-economic status. Coming from a large or a low-income family significantly increased the men's likelihood of having paranoid or schizotypal personality disorder symptoms. Having a young father or showing daring behavior significantly predicted paranoid personality disorders. Those with symptoms of schizotypal personality disorder were more likely to have experienced poor supervision or harsh discipline and tended to have low verbal and non-verbal IQs.

Three of the childhood risk factors were significantly related to the two cluster C personality disorders. Having a convicted father and low verbal or non-verbal IQ significantly predicted dependent personality disorder. The same risk factors were significantly predictive of obsessive-compulsive personality disorder symptoms. However, these associations were negative. For example, males who had a low verbal or non-verbal IQ or a convicted father were significantly less likely to show symptoms of obsessive-compulsive personality disorder.

The results of the logistic regression analyses that predicted personality disorder symptoms are shown in Table 10. Of the original 20 associations, there were initially 14 for conduct and 16 for antisocial personality disorder with a level of statistical significance less than 0.05. However, following logistic regression analyses, only four of the previous statistically significant associations remained significant, indicating that they were

independently predictive. Significant ORs were obtained for associations between conduct disorder and family risk factors, including a disrupted family (OR = 3.20), large family size (OR = 2.00), harsh discipline (OR = 2.24), and high impulsivity (OR = 2.52). Males with a convicted father (OR = 2.91), a nervous mother (OR = 2.03), poor supervision (OR = 2.36), or daring behavior (OR = 2.81) were more likely than males without these characteristics to show symptoms of antisocial personality disorder later in life.

Of the original eight statistically significant associations between childhood risk factors and borderline personality disorder, poor supervision (OR = 2.28) and low socio-economic status (OR = 2.23) remained significantly and independently predictive of borderline personality disorder. Following logistic regression analyses, large family size remained predictive of paranoid (OR = 1.97) and schizotypal (OR = 1.87) personality disorder symptoms. Additionally, showing daring behavior (OR = 2.32) during childhood predicted paranoid symptoms, and low non-verbal IQ (OR = 2.03) predicted schizotypal personality disorder symptoms.

Of the original three associations between childhood risk factors and dependent and obsessive personality disorder symptoms, only one attainment variable remained statistically significant following logistic regression analyses. Symptoms of dependent personality disorder were predicted by low nonverbal IQ (OR = 2.1), while obsessive-compulsive personality disorder symptoms were negatively predicted by low verbal IQ (OR = 0.51).

Table 10. Logistic regression analyses predicting personality disorders in later life.

Risk factor (domain)		LRCS change	p	Partial OR	p
Conduct PD					
disrupted family	(family)	14.59	< 0.001	3.20	0.001
high impulsivity	(individual)	11.21	0.001	2.52	0.004
harsh discipline	(family)	6.37	0.006	2.24	0.009
large family size	(socio-economic)	3.70	0.027	2.00	0.026
Antisocial PD					
convicted father	(family)	16.94	< 0.001	2.91	0.002
high daring	(individual)	11.12	0.001	2.81	0.002
poor supervision	(family)	5.17	0.012	2.36	0.013
nervous mother	(family)	4.10	0.043	2.03	0.021
Borderline PD					
poor supervision	(family)	6.40	0.006	2.28	0.021
low social class	(socio-economic)	3.53	0.030	2.23	0.026
Paranoid PD					
high daring	(individual)	8.80	0.002	2.32	0.003
large family size	(socio-economic)	4.26	0.020	1.97	0.018
Schizotypal PD					
low non-verbal IQ	(individual)	5.94	0.008	2.03	0.020
large family size	(socio-economic)	3.08	0.040	1.87	0.037
Dependent PD					
low non-verbal IQ	(individual)	4.84	0.014	2.09	0.012
Obsessive-compulsive PD					
low verbal IQ	(individual)	5.05	.0125	0.51	0.015

Note. LRCS – likelihood ratio chi-square; OR – odds ratio; p – one-tailed 95% significance level.

8.3.3 Risk scores versus personality disorder

A risk index was created for conduct and antisocial personality disorder based on summing the presence or absence of the four independently predictive risk factors for conduct personality disorder and the four independently predictive risk factors for antisocial personality disorder revealed by logistic regression analyses. Table 11 shows that the percentage who actually became disordered increased steadily with the risk score in both cases. Based on the results of the ROC analyses (AUC = 0.71 for conduct disorder and AUC = 0.72 for antisocial personality disorder), the two risk scores were dichotomised at the presence of three or more risk factors. For conduct disorder, this correctly identified 81.3% of individuals with or without symptoms of conduct personality disorder (OR = 7.24). The positive predictive value (percentage of individuals classified as likely to show conduct personality disorder symptoms who actually showed symptoms) was 58.6%, whereas the negative predictive value (percentage of individuals classified as not likely to show conduct disorder symptoms who did not show symptoms) was 83.6%. The percentage of false negative errors (percentage of individuals classified as likely to be symptom free who actually showed symptoms of conduct disorder) was 16.4%, and the percentage of false positive errors (percentage of individuals who were classified as likely to show symptoms who did not in fact show symptoms of conduct disorder) was 41.4%.

Table 11. Risk scores based on childhood factors predicting conduct and antisocial personality disorders in later life.

Risk score	n	n (total)	% (yes)	n	n (total)	% (yes)
	Conduct PD			Antisocial PD		
0	12	117	10.3	10	114	8.8
1	18	111	16.2	20	110	18.2
2	15	46	32.6	18	47	38.3
3	13	23	56.5	11	27	40.7
4	4	6	66.7	5	5	100.0
Total	62	303	20.5	64	303	21.1

Conduct PD: AUC = 0.707, $p < 0.001$
Antisocial PD: AUC = 0.718, $p < 0.001$

For antisocial personality disorder the risk index correctly identified 78.9% of individuals with or without symptoms of antisocial personality disorder (OR = 4.67). The

positive predictive power (percentage of individuals classified as likely to show antisocial personality disorder symptoms who in fact showed symptoms) was 52.9%, whereas the negative predictive power (percentage of individuals classified as not likely to show antisocial personality disorder symptoms who did not in fact show symptoms) was 82.9%. The percentage of false negative errors (percentage of individuals that was classified as symptom free although they showed symptoms of antisocial personality disorder) was 17.1%, and the percentage of false positive errors (percentage of individuals classified as showing symptoms of antisocial personality disorder that did actually not show symptoms) was 47.1%.

8.4 Discussion

8.4.1 Risk factors, personality disorders and violence

This paper examined childhood risk factors for personality disorder symptoms related to violence. Even though this is one of the first studies that used data from a community-based longitudinal study to investigate the associations between personality disorders and violence from childhood to late middle adulthood, the results confirm and extend previous findings indicating significant relationships between several different personality disorder symptoms and violence. Specifically, symptoms of cluster A and cluster B personality disorders (see also Coid, 1998; Esbec, & Echeburua, 2010; Johnson et al., 2000; Roberts, & Coid, 2009) were most strongly associated with lifetime violent acts by the CSDD males. The strong association between antisocial personality disorder and violence is less surprising, given the fact that both measures likely assess the same underlying construct, as violent behavior is a constituent symptom of antisocial personality disorder (see Section 4.4.4, p. 93; see also Coid et al., 2017).

The findings of this study also support the hypothesis that the personality disorder symptoms are predicted by exposure to childhood traumatic experiences, including family breakdown, parental neglect, and physical as well as emotional abuse (see also Gibbon, Ferriter, & Duggan, 2009; Johnson, Cohen, Brown, Smailes, & Bernstein, 1999; Spataro, Mullen, Burgess, Wells, & Moss, 2004; Yen et al., 2002). The results show that symptoms of cluster B personality disorders (i.e., conduct and antisocial personality disorder symptoms) were predicted by a variety of negative childhood experiences, ranging from socio-economic and family- to individual-level factors. The findings suggest an increased risk of developing conduct and antisocial personality disorder symptoms among children born in disrupted families who were exposed to poor supervision or harsh discipline, and who showed early highly impulsive or daring behavior. A similar finding was reported by Ullrich and Marneros

(2007) in their study on childhood antecedents of ICD-10 personality disorders based on data from the Halle Defendant Study Part II (see also Coid et al., 2005). Socio-economic indicators such as large family size significantly predicted cluster A disorders, namely paranoid and schizotypal personality disorder symptoms. Additionally, individual characteristics such as daring behavior were predictive of paranoid personality disorder symptoms and low non-verbal IQ predicted schizotypal personality disorder symptoms.

Notably, cluster C personality disorder symptoms related to violence were not significantly predicted by adversity in childhood (see also Zhang, Chow, Wang, Dai, & Xiao, 2011). Only academic performance predicted symptoms of cluster C personality disorders. The findings revealed a negative association between low verbal IQ and obsessive-compulsive personality disorder symptoms. The literature suggests that individuals in this personality disorder category tend to comply with rules and have a strong drive for achievement, which during childhood may lead to high academic performance. Logan and Johnstone (2010) added that, while this desire for perfection may be seemingly advantageous in some respects, it may be an explanation for violence in other cases. They hypothesize that violence in individuals with obsessive-compulsive personality disorder may arise when they perceive loss of control. In these cases, violence may be used in attempt to restore this perceived or actual loss of control.

Individuals diagnosed with personality disorders are often characterised by fragile self-esteem, emotional dysregulation, impulsiveness, and unstable interpersonal relationships. Logan and Johnstone (2010) suggested that violence, as an externalised response may arise when an individual with, for instance, a more socially inhibited personality is confronted by perceived evidence of their social inadequacy. Violence could be used as a means to restore self-esteem; a perceived injury or fear of rejection may trigger intolerable feelings of shame and humiliation which are highly threatening to fragile self-esteem. Violence in individuals with personality disorder symptoms, particularly those of clusters A and B, may be more a result of the desire to prevent disconnection and express intolerable emotions (see also Berking, 2012; Eisenberg, Spinrad, & Eggum, 2010).

The risk scores calculated for conduct and antisocial personality disorders indicated that it is possible to predict the presence or absence of personality disorder symptoms in this community sample based on risk factors measured in the early years of life. It is remarkable that risk factors measured at ages 8 to 10 were able to predict quite accurately the presence or absence of antisocial personality disorder symptoms at age 48. A similar observation was

made by Johnson and colleagues (2000), who suggested that it may be possible to identify early symptoms of personality disorders among youths. Since many of the risk factors that are related to personality disorders concern the family environment and individuals' self-control, prevention strategies aimed at helping parents learn the skills needed to socialize their children (Piquero, Farrington, Welsh, Tremblay, & Jennings, 2009; Piquero et al., 2016a), as well as strategies geared towards improving a child's own self-control (Piquero, Jennings, & Farrington, 2010; Piquero, Jennings, Farrington, Diamond, & Reingle, 2016b), are desirable.

Although research indicates a link between personality disorders and violence, it must, of course, be kept in mind that the presence of a personality disorder diagnosis does not always result in violent behavior and that only a fraction of all violent acts are committed by individuals with mental health problems (e.g., Fazel & Grann, 2006; Swanson, Holzer, Ganju, & Jono, 1990). Criminal behavior is usually the result of a complex interaction between individual characteristics and particular social contexts. Violence risk assessment in individuals with personality disorder should be context specific and should take into account *how* individual symptoms may or may not result in violence (see also Lowenstein, 2016).

8.4.2 Strength and limitations

The present study has some notable strengths. It is one of the first studies that has investigated the link between family socio-psychological factors, violence, and personality disorder symptoms from childhood to late middle age. The CSDD is a prospective longitudinal community study with a 50-year follow-up period which makes it possible to investigate associations over time. To date most studies of the development of personality disorders are based on retrospective reports, which often are biased due to the knowledge of a later outcome. Personality disorders in the CSDD were assessed using the SCID-II, which is a well-recognised measure, considered both reliable and valid. Analyses in this study involved the investigation of specific associations between individual personality disorder symptoms and violent offending. Many analyses so far have only examined the relationship between a single combined dimension of personality disorder (see e.g., Putkonen, Komulainen, Virkkunen, Eronen, & Lönnqvist, 2003; Wallace et al., 1998) and more general measures of crime (see e.g., Coid, 2005; Keeney, Festinger, Marlowe, Kirby, & Platt, 1997).

One of this study's limitations is that results may not be generalisable. Analyses are based on a fairly homogeneous sample of mostly white, working class males from one area in South London. Therefore, replication of this work in other contexts and across both genders is desirable. In addition, the CSDD is a community sample and thus phenomena like personality

disorders and violence convictions are relatively rare. To account for this fact a methodological approach was chosen which allowed to focus on the prevalence of individual symptoms rather than formal diagnosis.

Further, risk factors used in this study to predict personality disorder symptoms were measured quite early, at ages 8 to 10. It is clear that later events matter as well, and it would be an asset to include those too when investigating associations over the life-course. Similarly, personality disorders were only assessed at age 48. Several of the personality disorders examined in this study show distinct developmental patterns and hence, it is possible that some males would have been categorised differently at the time of their offences.

Finally, it must be noted once again that, in line with the definitions provided in Chapter 2.2.4, this paper examined antecedents of personality disorder symptoms. It may be that many of the men showing symptoms of personality disorders, would be seen as having "normal" personality in a strictly clinical context. Therefore, this paper should be understood as an analysis of varying personalities with focus on personality disorder symptoms.

8.4.3 Concluding remarks

This study set out to investigate the relations between childhood risk factors, adult personality disorder symptoms, and lifetime violence convictions. The findings of this study indicate that individuals with symptoms of DSM-IV cluster A and B personality disorders are more likely to commit violent acts during their lives than individuals without such symptoms. The results also suggest that individuals with symptoms of these personality disorders are more likely to have experienced adverse and traumatic childhood experiences than those without personality disorders.

Families and schools seem to be particularly crucial environments which may influence the development of personality disorders and behavioural problems such as violence. More prospective longitudinal studies are needed that have the capacity to further disentangle the complex interactions between psychosocial family factors, personality disorders, and violent behavior over the life-course. It will be of interest for future research to further explore the underlying mechanisms, in order to better understand the meaning and function of violence for individuals with personality disorders, and to provide a solid basis for the development of adequate and more effective intervention programmes.

9 Discussion

This thesis set out to further unravel the interrelations between mental disorders (including non-clinical levels of mental health symptoms) and offending behaviour by addressing the gaps in the literature in three independent papers. Together, these papers identified some major themes, which are synthesised and discussed in this chapter.

9.1 Reflections on Paper I

The aim of this first paper was to conduct a systematic review and meta-analysis of the literature on the link between developmental trajectories of offending and mental health outcomes (i.e., anxiety and/or depression) based on analyses using data from prospective longitudinal studies. Findings indicate that different offender groups face varying probabilities of mental health problems (i.e., anxiety and/or depression), with individuals in more severe and/or chronic offending trajectories experiencing more adverse symptoms. Specifically, it is suggested that a life-course persistent delinquent lifestyle has detrimental effects on an individual's mental health, highlighting the need for long-term support of chronic offenders by criminal justice and mental health authorities.

9.2 Reflections on Paper II

The second paper sought to link research into offending pathways with the study of the intrafamilial transmission of mental health problems by using data from a well-designed community-based prospective longitudinal study. With regard to long-term associations between offending trajectories and mental health outcomes (i.e., anxiety and/or depression) it is found (1) that those with more severe and/or chronic offending pathways had a greater vulnerability to developing internalising problems and (2) that, in contrast to previous research, symptoms of anxiety and depression were highest among those who only commenced offending in adulthood (i.e., late-onset offenders). Further, with regard to the intergenerational transmission of internalising and externalising problems, findings indicate (3) a certain degree of familial continuity of mental health problems and demonstrate (4) an overall effect of paternal offending behaviour on offspring mental health problems, which has been found to be slightly greater for daughters than for sons.

9.3 Reflections on Paper III

The third paper set out to investigate the relations between childhood risk factors, adult personality disorder symptoms and violence convictions over the life-course. It complements the earlier CSDD-data driven chapter by looking at the predictive effects of

certain mental health symptoms. Findings revealed (1) a number of associations between several distinct personality disorder symptoms and violence. Specifically, symptoms of cluster A and cluster B disorders were associated with lifetime violent behaviour. Further, results (2) support the hypothesis that personality disorder symptoms may be predicted by exposure to childhood traumatic experiences (e.g., neglect and abuse) and stress the importance of family context and family functioning in the development of both personality disorders and behavioural problems such as violence.

9.4 Heterogeneity in Offending Behaviour

One aim of this thesis was to link research into offending pathways with the study of mental health needs among offenders in the community. This aim builds on earlier evidence base on how offenders follow distinct offending trajectories (e.g., life-course persistent, adolescence-limited), stressing the importance of looking at distinct categories of offenders when analysing longitudinal data. Findings highlight that it is certainly of relevance to both mental health and criminal justice research and practice to recognise the heterogeneity of offenders when studying and assessing mental health needs. Results have shown that those who start early and pursuit in their criminal careers tend to have more mental health problems (e., anxiety and/or depression) over the life-course compared to those who desist (Paper I and Paper II) (see also Piquero et al., 2012 for psychopathy). This finding is consistent with the pattern of results that emerged from the literature review. Specifically, the observation that people with mental health problems are overrepresented in correctional settings, assuming that these individuals represent the more extreme end of the spectrum with regard to the persistence and severity of their offending behaviour (Section 4.5, p. 95).

Further, surprisingly, it was found that people in adult onset, relative to other offender trajectories, had worse mental health outcomes (i.e., anxiety and/or depression) (Paper II). Past research on adult-onset offending has long debated why someone who successfully goes through adolescence without (officially) engaging in offending behaviour would suddenly start engaging in crime as an adult, long after the peak age. However, developmental and life-course theories of crime, such as Sampson and Laub's (1993, 2005) age-graded theory of informal social control have offered potential explanations that may also be relevant for the explanation of these individuals' mental health problems. Sampson and Laub's theoretical assumptions would presume that late-onset offenders result from a lack of social bonds that typically come with age. In line with that, there is substantial evidence indicating that meaningful social relationships contribute to an individual's overall health and well-being,

hence the lack thereof may contribute to more adverse mental health outcomes (e.g., Holt-Lunstad, Smith, & Layton, 2010). In fact, past research has linked adult-onset offending to specific mental health problems (e.g., Elander, Rutter, Simonoff, & Pickles, 2000; Zara, & Farrington, 2010, 2013). Further, some research has also supported the connection between late-onset criminal behaviour and substance dependence (e.g., Elander, Rutter, Simonoff, & Pickles, 2000; Pulkkinen, Lyyra, & Kokko, 2009; Zara, & Farrington, 2010), which, in turn, has been shown to be associated with mental disorders (e.g., Elbogen, & Johnson, 2009; Fazel, Långström, Hjern, Grann, & Lichtenstein, 2009; Grann, & Fazel, 2004; Modestin, & Wuermle, 2005; Räsänen et al., 1998). It is also plausible that some adult-onset offenders may suffer from breakdown of marital (and other relationships) which may contribute to internalising and externalising problems, although this remains to be further investigated. Overall, late-onset offenders may, be more likely to lack meaningful connections and to be affected by mental disorders or substance dependence and as such, they may be a group of particularly vulnerable individuals who need specific research attention.

In summary, findings show that a more thorough understanding of the heterogeneity of offenders is important for two reasons: first, in order to recognise people's individual challenges and needs and secondly, to tailor more effective prevention and early intervention programmes that can respond to people's individual circumstances. This seems particularly crucial concerning the extent to which some individuals with distinct offending pathways experience adverse mental health outcomes (Paper II; see also Ttofi, Piquero, Farrington, & McGee, 2019).

9.5 Heterogeneity of Mental Disorders

Results demonstrate further the importance of recognising the fact that people with mental disorders are not a homogeneous group. Mental disorders comprise a wide range of problems as evident by the great number of diagnostic categories. Notably, research has also identified a considerable heterogeneity within specific categories and this heterogeneity, resulting from a wide range of symptoms, courses of varying duration and severity as well as different outcomes, should be acknowledged when looking at relevant data.

Findings of the reviewed literature indicate that more severe mental health problems, such as schizophrenia and other psychotic disorders, bipolar disorder and cluster B personality disorders may be associated with an increased risk of offending (see Section 4.5), while problems like anxiety and depression, which are also highly prevalent in offenders, have been

hypothesised to be outcomes of offending rather than part of its causes (e.g., Jolliffe et al., 2019; Defoe, Farrington, & Loeber, 2013).

This presumed pattern is consistent with findings of this thesis' analyses demonstrating a significant association between offending behaviour and later-life anxiety and/or depression (Paper I and Paper II); likewise, some personality disorder symptoms, specifically those of cluster B disorders, were found to be predictive of later-life violence convictions (Paper III). It is important to note, however, that the present evidence indicates that some mental disorder symptoms are linked to offending behaviour but, as of yet, no causal relationships have been established.

Additionally, the high comorbidity of mental disorders found in previous as well as in this study further complicates the picture and makes precise assessment, prognosis, and treatment more difficult. Within this thesis, comorbidity was evident between disorders such as depression and anxiety or personality disorder symptoms.

In summary, findings indicate that a more thorough understanding of the heterogeneity of individuals with mental disorders, including a more careful evaluation of their specific symptoms, which may require a shift from a diagnosis-specific focus to a more transdiagnostic approach, is important for several reasons: first, in order to recognise people's individual experiences, secondly, to tailor more effective prevention and intervention programmes that can respond to people's individual circumstances and thirdly, to allow for establishing the precise temporal patterns of internalising and externalising behaviour problems. This seems particularly important in order to determine whether the relationship between mental disorders and offending behaviour is one of correlation or one of causality, as causal inferences, when poorly substantiated, only increase stigma and have devastating effects for people with mental disorders.

9.6 Family Context and Functioning

Another aim of this thesis was to investigate the intergenerational transmission of antisocial behaviour and mental health problems (i.e., anxiety and/or depression). As findings indicate a certain predictive power of fathers' internalising and externalising behaviour problems on their children's adult mental health outcomes (Paper II), it can be concluded that the family context plays an important part in the development of anxiety and depressive disorders in youth (see also Silberg, Maes, & Eaves, 2010; Tully, Iacono, & McGue, 2008). The family is the prime location for socialisation and results from this thesis are in line with

the more recent scientific evidence on intergenerational transmission mechanisms, explaining how parenting behaviours may confer resilience against intergenerational risk and family concentration of criminal behaviour, for instance (see e.g., McLeod, Weisz, & Wood, 2007 for a review).

Likewise, this thesis' analyses have demonstrated the importance of family context and functioning in the development of adult personality disorder symptoms (Paper III). For instance, childhood risk scores calculated for conduct and antisocial personality disorders significantly predicted the presence or absence of these symptoms later in life (see also Johnson et al., 2000). Symptoms of these cluster B disorders were predicted by a variety of adverse childhood experiences, including growing up in a non-intact family coupled with poor supervision or harsh discipline, which have also been shown to play a role in the development of antisocial and offending behaviour (Bailey, Hill, Oesterle, & Hawkins, 2009; McLoughlin, Rucklidge, Grace, & McLean, 2010).

Children's behaviour and psychopathology risk can be by influenced by a number of parental characteristics, including their mental health as well as their parenting skills. According to Sampson and Laub's (1993, 2005) age-graded theory of informal social control, the family is a major social institution, which ideally provides structure and routine activities and thereby reduces opportunities for engaging in deviant behaviour. However, weak social bonds and less stability is hypothesised to increase the chances of delinquent behaviour (see also Thornberry, 1987). The nature of familial bonds is likely to affect parenting behaviours, such as affection, support, guidance, punishment and monitoring and in turn these parenting practices are believed to have an effect on the quality of the bonds (i.e., feedback loops; see also Thornberry, 1987), too. Thornberry's interactional theory, for instance, proposes that ineffective parenting practices (e.g., low affective ties, child maltreatment, neglectful or harsh parenting) increase an individual's risk of antisocial and offending behaviour (see also Smith & Farrington, 2004). Mirroring these theoretical assumptions, research on social bonds and mental health also reports strong associations. The link between relationship quality (i.e., supportive and meaningful connections) and emotional wellbeing as well as mental health has been documented across various life stages of an individual's development, consistently showing strong positive correlations in children, adolescents and adults (e.g., Rothon, Goodwin, & Stansfeld, 2011). Some recent evidence has also shown that positive adolescent family relationships continue to be associated with benefits for mental health throughout the transition to adulthood and into midlife (Chen & Harris, 2019). In line with this observation, it is hypothesised that sources of social and emotional support in early family life likely

encourage the development of coping skills for changing and cumulative stressors (Berkman, Glass, Brissette, & Seeman, 2000; Thoits, 2011), thereby promoting mental health throughout the life-course from early adolescence to mid-adulthood and helping to prevent negative outcomes. Although theory testing was not the focus of this dissertation, parts of the longitudinal analyses in the thesis point towards these theoretical postulates.

Overall, it can be concluded that families form the context for a great deal of human development. They can influence an individual's motivation for social conformity or deviance, be a source of resilience or a source of stress to which a person might respond with mental health problems. Specifically, the overlap of risk factors is an interesting finding and stresses the importance of family context and functioning in the development of both mental health problems and behavioural problems such as violence (Paper III).

Hence, it is particularly important not to ignore early childhood behavioural difficulties as they may persist and develop into more serious problems over time. Further, identifying children with early behavioural difficulties may offer a unique opportunity for supporting vulnerable children and families and helping them to rebuild and strengthen family relationship competencies, thereby promoting family health and minimising a child's risk of adverse outcomes later in life.

9.7 Strengths and Limitations

This section discusses the strengths and limitations that apply to this doctoral study as a whole, while strengths and limitations of the individual papers have been discussed in more detail in the respective chapters. Although this thesis contributes to the literature in many ways, some limitations should be noted.

First, as the focus of this thesis lies on community samples and community-based studies, the low base rate of severe mental health problems and violence convictions, with regard to low prevalence in the population, renders these phenomena difficult to study. Thus, particularly large samples are needed to reduce statistical uncertainty. Further, due to the low prevalence of mental health problems and criminality, some analysis could not be conducted, particularly among female study participants (e.g., Paper III) or were based on below diagnostic threshold symptoms (Paper II and Paper III). Although the latter allowed for a more symptom-focused approach, which has a number of advantages, it clearly affects the comparability of results with other studies.

Secondly, as discussed in the introductory chapters on mental disorders and crime, both phenomena are culture-bound social constructs and as such there are conceptual differences and variations in the operationalisation of the phenomena across studies (especially Paper I), specifically with regard to measures of mental disorders and offending trajectories. Further, one may take into account potential clinical judgement bias in personality disorder diagnosis, let it be relating to ethnicity or other characteristics of the potential patient (Mikton & Grounds, 2007). Also, measures used in longitudinal studies can suffer from historical specificity as new measures are constantly developed (Cohen, Slomkowski, & Robins, 1999). For comparability reasons it would be best to use the same instruments over time and across studies, however, some measures may appear outdated or become less applicable with changing social and political contexts. Similarly, the content of prospective studies is inevitably shaped by the research context at the point at which the study was set up. Hence, questions or measures that, with hindsight, would have been meaningful to include may not have seemed important at that time.

Thirdly, as cohort studies typically focus on following a specific group, rather than a representative sample of the population, findings are often only representative of that specific group. For instance, analyses of this thesis are based on data from the CSDD, which studies the development of antisocial and offending behaviour in a fairly homogeneous sample of mostly white, working class urban males from South London. Although the extension of the study by including the third generation has made the sample more heterogeneous in terms of geographical location and social status, the overall generalisability of findings is questionable. However, cross-national comparisons of the main study males sample with male samples in Sweden (Farrington, & Wikström, 1994) and Pittsburgh (Farrington, & Loeber, 1999) found overall comparable results.

Despite these limitations, this thesis contributes to the literature by being one of the first (1) to link research into offending pathways with the study of longitudinal effects and intergenerational transmission of mental health problems (i.e., anxiety and depression) and (2) to investigate the link between family socio-psychological factors, violence, and personality disorders from childhood to late middle age by using data from a well-designed community-based prospective longitudinal study, namely the CSDD.

The CSDD is a prospective longitudinal study with a 60-year follow-up period, which makes it possible to investigate associations over the life-course and across generations. Generally, longitudinal and intergenerational studies struggle with attrition, however this

study has managed to maintain very high participation rates for the main study males and a very high proportion of their children have been interviewed as well. Further, the CSDD used the GHQ and the SCID-II for the assessment of mental health problems, which are both well-recognised measures and considered to be reliable and valid. Despite the low base rates of severe mental health problems and violence convictions, the quality of the data obtained in over nine face-to-face interviews is remarkably. Overall, measures of offending behaviour and mental disorders included in the CSDD allow for specific analyses between the various conditions and behaviour problems and for studying a wide range of dynamic risk factors.

In general, longitudinal studies are able to sketch out a detailed picture of individuals' lives by linking early-life circumstances and experiences with later life outcomes. They allow for establishing more accurate and reliably ordered accounts of key events and experiences in individual lives. Understanding the order in which events occur is important for assessing causation (Imbens & Rubin, 2015). Further, longitudinal data allows for the exploration of dynamic rather than static concepts, which is important for understanding how people move from one situation to another, thereby allowing the identification of areas for intervention. Hence, more research based on prospective longitudinal studies is needed to increase the understanding of potential mechanisms that may link early individual and familial predictors and adult outcomes including mental health problems and criminal behaviour.

10 Conclusions and Future Directions

This thesis set out to further unravel the complex interrelations between mental disorders and offending behaviour by identifying and addressing gaps in the existing literature in order to contribute to a more comprehensive understanding of their association over the life-course. Findings make a valuable contribution to the ongoing debate on mental health problems and criminal justice policy and practice by delivering more precise information for policymakers and healthcare providers. Further, findings have important implications for clinical and correctional practice, public perceptions, and the quality of life of many people.

Offending is found to be more prevalent among people with mental disorders and those who offend have been found to be more likely to develop mental health problems. Despite a large number of studies agreeing that there is an association between mental disorders and offending, there is only little consensus about the precise nature of the relationship. The review of the literature has shown that the risk of offending seems to grow with the number and severity of psychiatric conditions and conversely, that the risk of mental health problems increases with severity and persistence of offending behaviour, further complicated by high comorbidity, specifically with substance use disorders (Chapter 4). The concepts of criminal offending and mental disorders comprise a wide range of problems and research has identified considerable heterogeneity among individuals with specific internalising and externalising problems in terms of symptoms, severity, as well as different outcomes.

The papers in this thesis aimed at bridging some of the research gaps regarding the association between offending and mental disorders. Having drawn attention to the importance of studying different offending pathways in the development of mental health problems, the considerable heterogeneity of psychological symptoms and mental disorders and the role of early-life family context, findings demonstrate (1) that those with more severe and/or chronic offending pathways have an overall greater vulnerability to developing internalising problems (i.e., anxiety and/or depression) in middle adulthood, (2) that certain personality disorder symptoms, specifically cluster A and cluster B disorders, are associated with lifetime violent behaviour and (3) that early-life paternal offending is associated with adult children's internalising and externalising problems. It is hoped that these findings may be translated into future preventive policies. These topics are discussed in more detail below.

10.1 Implications: Policy and Practice

Overall, findings indicate that people with more severe offending histories and life-course persistent antisocial lifestyles are more vulnerable to adverse mental health outcomes (i.e., anxiety and/or depression). Likewise, results show that individuals with more severe psychiatric disorders, such as certain personality disorder symptoms, have an increased risk of committing violent acts. However, as has also been shown, criminal offending and mental disorders share many risk factors (e.g., non-intact families, poor parental supervision, harsh discipline, early impulsive or daring behaviour), a fact which renders it difficult to assess to which degree mental disorders have an independent effect on the risk of offending or conversely, to which degree criminal offending and its consequences has an independent effect on the risk of developing mental health problems and even more to which degree effects are additive or interactive to each other and other risk factors.

Hence, interventions targeting families as part of their work can play an important role in preventing the development of internalising and externalising behaviour problems (see also Farrington, 2006; Farrington & Welsh, 2003; Schumaker, 1997; Scott, Spender, Doolan, Jacobs, & Aspland, 2001) and future family-based interventions should expand their current focus in a way that highlights more issues of mental health. This thesis has documented the importance of family context and functioning in the development of both mental health problems and offending behaviour. As such, family-focused interventions designed to support positive family connections as well as communication and problem-solving skills that may help young people to foster healthy relationships with supportive social networks could build long lasting stability. Further, individualised treatment approaches for children and/or parents demonstrating antisocial behaviour may contribute to changing maladaptive patterns within and around the family. It is suggested that interventions combine different types of services such as parent training, family therapy and clinical services tailored to the child's needs. In that context, schools may play an important part in identifying at-risk youth who could benefit from family intervention programmes.

Further, as results indicate that those engaging in more serious offending behaviour or those experiencing more severe mental health problems are particularly vulnerable to further negative outcomes, it may be that these individuals with more severe symptoms are, overall, more susceptible to the adverse effects of other risk factors. Hence, clinical and correctional interventions targeting these particularly vulnerable individuals may help to minimise future risks and prevent the development of further negative outcomes. This calls into question, for

instance, the potential effectiveness of community-based treatment programmes designed to, more generally, reduce (re-)offending in offenders or mental health patients. It is suggested that more specific interventions or more narrowly defined high-risk groups should be considered to ensure the effectiveness of programmes and offer responses that are tailored to people's individual circumstances.It should be noted, however, that these conclusions and recommendations are based on correlational evidence and that, as of yet, no causal relationship between mental health problems and offending behaviour has been established.

Finally, given the high prevalence of mental disorders in the criminal justice system and the extent of violence in mental health care, it is suggested that prison and clinical staff are provided with more information, including more specific theoretical knowledge about mental disorders, their differing expressions and a more nuanced understanding of risk assessment processes, which may not only increase risk awareness but also generate valuable awareness about the language of risk, its purpose and effects (see also Walsh & Freshwater, 2009). Further, prison and clinical staff providing healthcare, assisting with the process of rehabilitation and overseeing safety and security should be offered a wide range of training programmes that provide them with more practical knowledge about how individual needs can be recognised and addressed without comprising people's safety (e.g., de-escalation techniques).

A closer collaboration between the criminal justice and mental health systems will allow to better address the complex clinical and criminogenic needs of justice-involved people with mental health problems. It is suggested that a closer collaboration can improve individual and wider social outcomes by preventing future justice involvement, developing more appropriate treatment, and thereby improving health and quality of life of people living in the community (see also Bonfine, Blank Wilson, & Munetz, 2020).

10.2 Implications: Public Perception

A closer collaboration between the systems and greater integration of the mental health and criminological research literature will not only contribute to a more comprehensive understanding of the relationship between mental disorders and offending behaviour, but will also help to promote a more evidence-informed public debate.

It has become evident throughout this thesis that there is a gap between public and scientists' views on the association between mental disorders and violence or offending behaviour (Chapter 4). In public perception, mental disorders and offending are often seen as

inextricably linked and this perception is further augmented by the media's portrayal of those with mental health problems. However, research indicates that, even though criminality and mental disorders may not be without connection, the relationship is often overemphasised. There seems to be a general fear of people with mental disorders in society and a tendency for unaffected individuals not only to exaggerate the strength of the association between mental health problems and violence but also to overestimate their own personal risk of experiencing victimisation.

Research has shown that the prevalence of community violence committed by individuals with mental disorders is, overall, very low, with an estimated population-attributable risk fraction of approximately 5% (e.g., Appelbaum, 2006; Fazel & Grann, 2006; Swanson et al., 2015). This indicates that the vast majority of people with mental health problems never engages in violence. In fact, quite the opposite may be true, as it is suggested that victimisation of people with mental disorders is a much greater public health concern (Teplin, McClelland, Abram, & Weiner, 2005).

Overall, public perception of the relationship between mental disorders and violence or offending behaviour does not seem to match empirical evidence and may only lead to social avoidance and further negative attitudes. For people affected by mental health problems, who already carry a heavy burden, stigma is an unnecessary and unacceptable source of additional stress. Stigma associated with mental disorders is created and reinforced at multiple levels, including governmental laws and policies, the media, community beliefs, organisational practices and in day-to-day contact with individuals who experience mental health problems (e.g., Estroff, Swanson, Lachicotte, Swartz, & Bolduc, 1998; Monahan, et al., 2001; Phelan & Link, 2004). As such, strategies to address stigma related to mental disorders and offending can include intervention at the structural, institutional, and individual level (National Academies of Sciences, Engineering, and Medicine, 2017).

Structural efforts to reduce stigma typically include legal and policy interventions that are intended to protect and normalise stigmatised groups (e.g., antidiscrimination laws). Educational interventions, such as mental health literacy campaigns can be implemented to target public stigma. It is suggested that in this context, schools can play an important role in increasing knowledge and improving attitudes among young people. Further, educational campaigns could make use of the media's strong influence on stigma and help to redefine its role as a means of promoting affirming and inclusive attitudes by

presenting factual information instead of reinforcing misconceptions and stereotypes of people with mental health problems as being threats to community safety. Lastly, contact-based interventions, which aim to overcome the interpersonal divide between people affected and unaffected by mental health problems (i.e., lack of contact that fosters discomfort and fear; see also Cook, Purdie-Vaughns, Meyer, & Busch, 2014) can help to reduce stigma on a person-to-person basis and can also benefit self-stigma by creating a sense of empowerment in individuals with mental disorders (Corrigan, Kosyluk, & Rüsch, 2013).

Social stigma does not only lead to additional unwanted stress, the fear of being labelled and subjected to discrimination can also discourage individuals from seeking help and treatment, which further adds to the social burden of untreated mental disorders, including chronic diseases, costs related to victimisation and crime, lost productivity and premature death (National Academies of Sciences, Engineering, and Medicine, 2017).

In summary, there are considerable gaps in the evidence on the precise relationship between mental disorders and violence or offending behaviour. However, creating positive change and reducing stigma and discrimination in a lasting way requires integrated efforts based on the best possible evidence.

10.3 Future Research

In order to further advance the understanding of the relationship between mental disorders and offending behaviour, future research should acknowledge that the study of mental health and criminal offending is a multifaceted research area, which will benefit from further integrating criminological and mental health perspectives (Venables et al., 2018). Future empirical research on the association between mental disorders and offending should specifically expand knowledge about the underlying mechanisms behind both phenomena. Hence, more longitudinal studies are needed that allow for examining within-individual changes over time and provide precise information about the timing of risk and protective factors in relation to the occurrence of offending and mental health problems.

Data gathered using this approach will be able to provide important information on dynamic risk factors that affect offending and mental health outcomes, which is key for designing evidence-based interventions (Ward & Fortune, 2015). Further, studies should include the broad range of factors commonly examined within criminology, including childhood trauma, early conduct disorder and family functioning, but should also expand the

scope of current data collection efforts by including a range of factors related to mental health outcomes, identified in the various fields of the social and medical sciences.

Research aiming at advancing the understanding of the relationship and developing evidence-based guidance should be conducted within a theoretical framework that takes into account the timing of events in relation to a broad range of risk factors. It is suggested that the developmental and life-course approach offers a unique opportunity to further disentangle the interrelations between mental health and offending behaviour, as this perspective allows for the integration of various topics for which the importance of long-term processes has been recognised. As has been shown, its key strength is the ability to establish precise temporal order of events, experiences, processes, as well as structural and situational factors over the life-course, which is essential for advancing knowledge about onset and desistance, about persistence and prediction, and about within-individual change. Further, developmental and life-course criminology is a multi- and interdisciplinary enterprise that does not only integrate empirical findings from various disciplines, but also allows for examining multiple life domains and incorporating the full range of phenomena that can affect an individual over the life-course.

The fact that later-life internalising and externalising problems have been shown to share a number of mutual antecedents, specifically early-life family-based factors (see Chapter 8), indicates that it is not only feasible but also beneficial for research to integrate the concept of mental disorders into developmental and life-course criminology (see also Chapter 5). It is suggested that research on the association between mental health and criminal behaviour will profit from the incorporation of life-course principles and further, that developmental and life-course criminology will benefit of integrating mental disorders into its theories. It will further promote developmental and life-course criminology's latest endeavour to not only investigate early predictors, but also advance knowledge about outcomes of offending, such as specific mental health problems. Further, an integration of the construct of mental disorders may also provide an opportunity to increase the understanding about theoretical propositions such as offender typologies, as findings indicate that for late-onset offenders, a group often neglected in criminological research, mental health problems may play a key role in the development and the developmental delay. Finally, researchers and practitioners alike should keep in mind that various criminal justice processes are themselves criminogenic risks that produce systematic conditions for recidivism and which, if modified, could make measurable difference in recidivism and other correctional efficiencies (Hannah-Moffat, 2016). Although system change was not the focus of this thesis, one should

acknowledge system-level issues relating to the notion of risk-and-needs assessment of potential offenders.

Overall, it is suggested that more prospective longitudinal studies, informed by the theoretical framework of a mental health integrated developmental and life-course perspective, will provide unique opportunities for future research to investigate the long-term processes of mental disorders and offending behaviour and to further disentangle their proposed interrelations in order to develop meaningful evidence-based guidance for policy and practice. A deeper insight into the factors contributing to offending behaviour and mental health problems, as well as a clearer understanding of *if* and *how* these two phenomena are interrelated over the life-course, will allow for the development of a more thorough person-centred theoretical model with practical implications, which, hopefully, will contribute to eliminating stigma and other difficulties that people with internalising and externalising problems face, thereby increasing community wellbeing, quality of life and overall mental health.

A more nuanced understanding of the interplay between mental health, crime, and offender management seems even more important amidst the current global pandemic. Given the detrimental impact of the pandemic situation on mental health, the timely design and delivery of individual and public mental health interventions has become increasingly important, with especially groups at a higher risk than the general population requiring appropriate responses in order to prevent the anticipated higher prevalence of mental health problems, associated consequences, and the widening of inequalities.

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Appendices

Appendix Table A. A total of 53 longitudinal studies. LXII

Appendix Table B. Correlation matrix of the childhood risk factors. LXIV

Appendix Table A. A total of 53 longitudinal studies.

Longitudinal studies included in the systematic review
Cambridge Study in Delinquent Development
Christchurch Health and Development Study
Collaborative Perinatal Project (Buka, 2017; Denno, 2018)
Columbia County Longitudinal Study (Dubow, 2017)
Dunedin Multidisciplinary Health and Development Study
Jyväskylä Longitudinal Study of Personality and Social Development (Pulkkinen, 2017)
Lives Across Time: A longitudinal Study of Adolescent and Adult Development
Mater University Study of Pregnancy
Oregon Youth Study (Capaldi, 2018)
Longitudinal studies excluded in the systematic review – no published information
1970 Birth Cohort (Sullivan, 2017)
Australian Temperament Project (Sanson, 2017)
Avon Longitudinal Study of Parents and Children (Molloy, 2018)
Cambridge-Somerville Youth Study (Welsh, 2018)
Chicago Youth Development Study (Tolan, 2017)
Copenhagen Project Metropolitan / Projekt Metropolit (Osler, 2018)
Criminal Career and Life Course Study (Blokland, 2017)
Danish National Birth Cohort Study (Meder, 2017)
Denver Youth Survey (Huizinga, 2018)
Edinburgh Study of Youth Transitions and Crime (McAra, McVieSmith, 2017)
FinnCrime Study (Elonheimo, 2017)
Glueck Longitudinal Study (Waldinger, 2018)
International Youth Development Study (Smith 2017 & Herde 2017)
Kauai Longitudinal Study (McCubbin, 2017)
Longitudinal Study of Danish Offenders (Kyvsgaard, 2017)
Mauritius Joint Health Project (Raine, 2018)
Montreal Longitudinal-Experimental Study (Tremplay, 2018)
Montreal Two-Samples Longitudinal Study (LeBlanc, 2017)

Appendix Table A. (continued)

National Child Development Study (1953 and 1958 Birth Cohort) (Goodman, 2017 & Maughan, 2017)
National Longitudinal Study of Adolescent to Adult Health (Harris, 2017)
National Longitudinal Survey of Children and Youth (STATCAN, 2017)
National Youth Survey (Elliott, 2017)
Newcastle Thousand Family Study (Pearce, 2017)
Northern Finland Birth Cohort Study (Männikkö, 2017, Miettunen, 2017, Savolainen, 2017)
NSCR Transfive Study Generation 3-5 (Weerman, 2017)
Örebro Project / Individual Development and Adaption Study (Stattin, 2018)
Peterborough Adolescent Development Study (Treiber, 2018)
Philadelphia Birth Cohort Study 1 & 2 (Tracy, 2018 & Kempf-Leonard, 2018)
Pittsburgh Youth Study (Ahonen, 2018)
Pittsburgh Girls Study
Project on Human Development in Chicago Neighborhoods (Earls, 2018)
Racine Birth Cohort Study (Kurlychek, 2018)
Research on Adolescent Development and Relationships (Branje, 2017)
Rochester Youth Development Study (Thornberry, 2017)
Seattle Social Development Project (Hill, 2017)
Stockholm Project Metropolitan / Stockholm Birth Cohort Study (Almquist, 2017)
Tracking Adolescents' Individual Lives Survey (Oldehinkel, 2017)
Tübingen Study (Kerner, 2018)
Young Lawbreakers as Adults (af Klinteberg, 2017)
z-proso, Zurich Study (Eisner, 2018)
Longitudinal studies excluded in the systematic review – no information could be obtained
Chinese Longitudinal Study (Friday, & Weitekamp, 2017 & 2018)
Crime in the Modern City (Boers, & Reinecke 2017 & 2018)
National Survey of Health and Development (Kuh, 2017 & 2018)
Woodlawn Longitudinal Project / Mental Health Studies (Ensminger, 2017 & 2018)

Note. Principal investigator or leading research associates in parenthesis. Dates refer to email communications.

Appendix Table B. Correlation matrix of the childhood risk factors.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	low family income	**1**																			
2	large family size	.46***	**1**																		
3	poor housing	.36***	.24***	**1**																	
4	low social class	.25***	.24***	.10	**1**																
5	convicted father	.21***	.22***	.21***	.14*	**1**															
6	convicted mother	.27***	.25***	.25***	.11	.37***	**1**														
7	young father	.12*	.17**	.09	.02	.20***	.08	**1**													
8	young mother	.08	.13*	.09	.09	.18**	.07	.46***	**1**												
9	father nervous	.08	.01	.01	.01	.10	.15*	.08	.02	1											
10	nervous mother	.10	.07	.02	.03	.12*	.17**	-.03	-.01	.08	**1**										
11	harsh discipline	.17**	.11	.11	.07	.16**	.25***	.12*	.01	.23***	.20**	**1**									
12	poor supervision	.40***	.30***	.25***	.24***	.20***	.29***	.05	.19**	.06	.10	.29***	**1**								
13	parental conflict	.26***	.07	.09	.09	.18**	.11	.03	.05	.29***	.19	.35***	.24***	**1**							
14	disrupted family	.22***	.06	.17**	.07	.30***	.17**	.23***	.22***	.09	.11	.13*	.20**	.19**	**1**						
15	low non-verbal IQ	.20***	.19***	.21***	.20***	.24***	.16**	-.05	-.01	-.02	.12*	.20**	.21***	.05	.14*	**1**					
16	low-verbal IQ	.32***	.30***	.18**	.20***	.17**	.11*	.11	.09	-.06	.06	.05	.30***	.04	.14*	.35***	**1**				
17	low attainment	.25***	.29***	.12*	.16**	.24***	.21***	.11	.08	.02	.06	.18**	.16**	.17**	.08	.27***	.48***	**1**			
18	high daring	.20***	.12*	.13*	-.01	.12*	.01	.02	.17**	-.01	.07	.15*	.23***	.14*	.17**	.05	.06	.03	**1**		
19	high impulsivity	.28***	.23***	.20***	.18**	.20***	.10	.04	-.03	-.07	.02	.13*	.19**	.08	.08	.32***	.23***	.31***	.09	**1**	
20	high hyperactivity	.15**	.17**	.12*	.01	.23***	.21***	.04	-.01	-.01	.10	.14*	.15*	.09	.08	.22*	.19***	.31***	.17**	.22***	**1**

Note. *p < .05, **p < .01 ***p < .001 (two-tailed)

N = 304