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0521804450 - Sex Differences in Antisocial Behaviour: Conduct Disorder, Delinquency, and Violence in the Dunedin Longitudinal Study

Terrie E. Moffitt, Avshalom Caspi, Michael Rutter and Phil A. Silva

Excerpt

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CHAPTER ONE

Introduction

It is widely understood that males are generally much more antisocial than females (Cook and Laub, 1998; Eme and Kavanaugh, 1995; Giordano and Cernkovich, 1997; Rutter, Giller, and Hagell, 1998; Steffensmeier and Allan, 1996). However, the implications of this sex difference for understanding the fundamental causes of antisocial behaviour have been virtually unexplored. We think that studying sex differences across the first decades of life offers an untapped resource for uncovering the causes of antisocial behaviour. Consider two fundamental facts about the distribution of antisocial behaviour across sex and age. It shows a male preponderance, and it shows a large increase in prevalence during adolescence. Other problem behaviours increase a lot during adolescence as does antisocial behaviour, but they show a female preponderance: depression and eating disorders, for example. Generally, social and psychological explanations have been put forward to explain the female preponderance, adolescent rise, and high prevalence of these emotional problems (Bebbington, 1996; Emslie, Hunt, and MacIntyre 1999). In contrast, some problem behaviours show a strong male preponderance as does antisocial behaviour, but they do not increase at all in adolescence, for example, attention-deficit hyperactivity, language delay, reading retardation, and autism. Generally, neuro-biological explanations have been put forward to explain the male preponderance, stability across age, and low prevalence of hyperactivity, dyslexia, and autism (Earls, 1987; Eme, 1979; Ounstead and Taylor, 1972).

Antisocial behaviour seems to be the sole anomaly in this otherwise orderly scheme. There has been much speculation about heterogeneous causes behind antisocial behaviour (Caspi and Moffitt, 1995; Rutter, Giller, and Hagell, 1998), and it is possible that some antisocial behaviour resembles

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Excerpt

[More information](#)

2 SEX DIFFERENCES IN ANTISOCIAL BEHAVIOUR

emotional problems in having social origins, while other antisocial behaviour resembles the neuro-developmental problems. The primary aim of this book is to sort out this anomaly by systematically analyzing the antisocial behaviour of males and females across the first two decades of life. We reasoned that a study of sex differences and similarities might uncover insights that could help to resolve the anomaly, and indeed it did.

Along the way, the secondary aim of this book is to raise the visibility of the sex difference as a critical tool for the study of all problem behaviours that have an unequal sex distribution. The empirical findings presented in the book are the results of new analyses from the Dunedin Study, not previously published. They will be of particular interest to students of antisocial behaviour. However, the questions framed in this book, and the analytic approaches that we use to answer them, are broadly applicable to the many human problems that show a sex difference. Thus, the overarching goal of this book is to pose research questions and to demonstrate analytic approaches that will be applicable to a broad spectrum of problem behaviours.

A précis of aims and findings

This section briefly highlights the aims and findings of the chapters in this book. Each empirical chapter is organized somewhat like a traditional research report. Each chapter ends with bullet points listing ‘take-home messages’ and ‘unanswered questions’. The ‘take-home messages’ are intended to articulate our findings with accountability and clarity, and to make them easily accessible to a broad and busy readership. The ‘unanswered questions’ are intended to acknowledge the many important issues that our own study was unable to address, and to stimulate future research by articulating testable research questions.

Description of the study design

Our empirical aim is to describe the developmental epidemiology of sex differences and antisocial behaviour during the first two decades of life, in the context of one long-term longitudinal study of a contemporary representative cohort of some thousand males and females born in 1972 to 1973 – the Dunedin Multidisciplinary Health and Development Study. Chapter 2 describes the Study, its research setting and its methods, and addresses how findings from this sample may be extended to other times and places. Throughout the book, we cite related studies from other times and places, and note whether or not Dunedin Study findings are consistent with theirs.

The Study’s *longitudinal design* allowed us to examine sex differences in

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[More information](#)

antisocial behaviour across nine assessments spanning the period from 3 to 21 years of age, and thereby covering the peak ages for the emergence of antisocial behaviour. Many of the analyses in this book focus on *antisocial behaviour during adolescence* both as the prime outcome of childhood risk and as an important predictor of subsequent adult outcomes. We emphasize adolescence because this is the developmental stage during which antisocial behaviour peaks in onset, prevalence, and incidence, and when antisocial behaviour tends to be consolidated into the diagnosable psychiatric disorders and patterns of criminal offending that are of great concern to mental health and criminal justice professionals.

The Dunedin Study's *multiple data sources* are diverse, and include parents' reports, teachers' reports and self-reports that are collected in most longitudinal studies of this kind. In addition, we also make use of observers' ratings, official police and court records, peer-informant reports, and partners' reports. Thus, the book contains comparisons of how findings about antisocial behaviour might vary depending on the source of the data. Chapters also address questions of gender bias in measurements: are courts lenient with females? Should diagnostic criteria be relaxed for females? Is female partner violence self-defence? We present results from *two methods of quantifying antisocial behaviour*: dimensional scales of such behaviour and categorical diagnoses of conduct disorder. By undertaking parallel analyses for both methods of measurement, we are able to shed light on whether findings about the population distribution of antisocial behaviour also apply to the extreme, presumably pathological, end of the distribution (Hinshaw, Lahey, and Hart, 1993). Analyzing multiple measures of antisocial behaviour is also intended to make the book's findings relevant to the concerns of multiple disciplines. Criminologists will find official police and court records and delinquency scales familiar, while child psychiatrists may be more familiar with conduct disorder diagnoses. To help readers interpret the measures that are less familiar to them, chapters describe the content of each measure, at the item level.

Sex differences in the amount of antisocial behaviour

Despite widespread consensus that males are more antisocial than females, the question of whether this is true throughout the whole course of development, in all circumstances, and in every kind of antisocial activity, is very far from settled. Accordingly, the first aim of this book is to query the generality of the sex difference. Chapters 3 to 5 present findings on overall sex differences in the amount of antisocial behaviour, measured with dimensional variables, diagnoses of disorder, and official offending records, for

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Excerpt

[More information](#)

4 SEX DIFFERENCES IN ANTISOCIAL BEHAVIOUR

both non-violent and violent acts. To our knowledge, these chapters offer one of the most comprehensive developmental portraits of sex differences in the amount of antisocial behaviour across the first two decades of life. In these descriptive chapters, as elsewhere in the book, sex differences are presented with reference to statistical effect sizes.

On the whole, the data in these three chapters confirm the ubiquity of the sex difference, but they also reveal some interesting and important lawful exceptions to this rule. In particular, males and females are remarkably similar with respect to their illicit use of drugs and with respect to their involvement in domestic violence. (Extra analyses show that the sex similarity in domestic violence applies to clinical cases of serious abuse, and is not an artefact of women's self-defence.) It is also noteworthy that sex differences are minimal with respect to the common forms of antisocial behaviour which typify the adolescent age period and which are relatively unassociated with other forms of pathology. The data demonstrate that this peak of adolescence-limited antisocial behaviour is linked, among girls, with their personal pubertal timing.

Not surprisingly, the male excess of antisocial behaviour is especially evident with respect to violent behaviour and violent crimes, as might be anticipated by the greater muscular strength of males. What was not quite so self-evident, however, is the finding detailed in chapter 16 that the male preponderance is most evident with respect to early-onset life-course-persistent antisocial behaviour. We attempted to determine whether or not this might be an artefact of the differences of overall level of antisocial behaviour between the two sexes by defining life-course-persistence according to the norms within each sex. The marked preponderance of males still held. This is an important form of antisocial behaviour in males but it is quite uncommon in females. Moreover, although the risk factors that predict life-course-persistent antisocial behaviour were the same for females as for males, the rarity of this serious form of behaviour among young women arose as a natural consequence of the rarity among girls of the risk factors for it.

Sex differences in the developmental course of antisocial behaviour

The book also aims to venture beyond the routine test for sex differences in the amount of antisocial behaviour. In seeking to understand the 'how' of the sex difference, we explore possible ways in which being male or female might influence developmental features of antisocial behaviour such as its stability over time or its age of onset. Chapters 6 and 7 compare official and self-report data and reveal that although a first 'official' offence in adulthood

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[More information](#)

is not unusual, among both sexes participation in antisocial behaviour seldom begins in adulthood and almost all people who will behave antisocially do so first during adolescence. As already noted, life-course persistence was the feature that most strikingly differentiated males and females. Thus, early-onset and persistent cases of antisocial disorder are rare and tend to be male, but among the majority of young people involved in antisocial behaviour the data revealed a surprising similarity across the two sexes with respect to both stability and onset age.

Testing for sex differences in developmental processes

In our reading of the literature, we found that sex differences in the *amount* of antisocial behaviour are frequently mistaken for evidence that males and females experience different antisocial developmental processes. In fact, the extant literature contains very few actual empirical demonstrations of sex differences in the aetiological factors involved with becoming antisocial, in the correlates of antisocial behaviour, or in its long-term consequences – the topics considered in chapters 8 through 16. Thus, the aim of these nine chapters is to address this gap in the empirical data base. In the past, three forms of error may have encouraged a too-hasty belief that there are differences in the causal processes affecting males and females: insufficient statistical testing, the use of single-sex samples, and publication bias. Here we explain how these errors come about.

All too often, it is assumed that if a risk factor significantly predicts antisocial outcomes in one sex but not in the other, this means that there is a significant difference between the sexes. Obviously, this is a faulty approach because comparing two *p* values is not the same as testing whether two coefficients differ significantly from each other. Comparing findings from separate analyses for each sex readily leads to false conclusions, and a study using Monte Carlo simulations has demonstrated that this danger is exacerbated when the sample sizes are modest (Cohen, Cohen and Brook, 1995). It is highly likely that many reports of sex differences in the literature are false because these are not properly tested.

The literature is replete with studies of just one sex, usually males. Often the researchers who study males caution that their findings *may not* apply to females, but this caution is sometimes misunderstood to mean that they *cannot* apply to females. Conversely, when females alone are sampled, the sampling decision has often been based on the assumption that findings will necessarily be unique to females. All too frequently, the findings from samples of females are discussed as being female-specific, but single-sex studies cannot address the sex-specificity of their findings. The effects of sex

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Excerpt

[More information](#)

6 SEX DIFFERENCES IN ANTISOCIAL BEHAVIOUR

on antisocial behaviour can be deduced only from samples that contain both males and females in sufficient numbers for appropriate statistical testing. Such research designs have been distinctly unusual in the past.

When a sex difference is found in a study, this is often reflected in the paper's title. The practice is to be expected, given the keen interest in sex differences in predictors and outcomes. Nevertheless, many reports that include both sexes check for sex interactions and, not finding any that could justify separate presentations by sex, collapse the sample. An informal survey of the literature on antisocial behaviour suggests that these 'less interesting' no-sex-difference findings are quite common. Because no-difference findings are seldom announced in the titles of papers (or in the 'key words'), they escape attention, particularly from today's computerized searches. This imbalance in paper titles contributes to a cumulative impression that sex differences are more common than sex similarities. But without an exhaustive and systematic meta-analysis, we cannot know whether or not this impression is correct. Seeking to avoid the aforementioned problems of inference, we systematically tested the Dunedin Study data base for sex differences in developmental processes.

Possible causes of sex differences in antisocial behaviour

Findings about the risk processes leading up to antisocial behaviour are presented in chapters 8, 9 and 10. Knowledge about the relevant risk factors has been greatly enhanced by the accumulation of findings from longitudinal studies (Campbell, 1995; Loeber and Hay 1997; Rutter, Giller and Hagell, 1998). From the array of possible risk factors, we identified a roster of more than thirty-five risk factors measured in the Dunedin Study, representing the domains of family life, neuro-cognitive risk, childhood behaviour, peer relations, and personality traits.

The analyses start by examining whether or not the same risk factors operate in males and females, and then go on to determine whether or not the size of effect in the two sexes differs significantly. We were aware of the much weaker statistical power for detecting significant interaction effects, as compared with that for main effects (McClelland and Judd, 1993). We paid special attention to the possibility that there might be large differences between the two sexes in risk-factor effects, even though they failed to show any significant statistical interaction. In the event, the findings showed remarkable similarities between males and females with respect to risk factors for antisocial behaviour. Chapter 8 reports that we found little evidence to suggest that males were more vulnerable to any set of risk factors

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[More information](#)

than were females. Not only were much the same factors important, but the size of effects was generally comparable across the sexes.

Chapters 9 and 10 address the ‘differential exposure hypothesis’, namely that males are more likely to be exposed to risk factors or that they tend to be exposed to more severe risk factors. The findings were striking in showing that males *were* more likely to experience neuro-cognitive deficits, undercontrolled temperamental features, weak constraint (poor impulse control), and hyperactivity. Moreover, taken together, these risk factors accounted for most of the sex difference found in antisocial behaviour. By contrast, there was no evidence of differential exposure to family risk factors. Family risk factors *are* important for antisocial behaviour, but this is so for both males and females in roughly similar degree, and therefore family risk and protective factors cannot account for sex differences in antisocial behaviour.

Disorders that are comorbid with antisocial behaviour

Chapter 11 aims to provide epidemiological information about which other psychopathologies are experienced by antisocial individuals. Comorbid psychiatric and social problems were an essential feature of antisocial behaviour in both sexes; almost all antisocial individuals in the Dunedin sample have comorbid disorders. Attention-deficit hyperactivity, cannabis dependence, and schizophreniform symptoms are all tightly linked to conduct disorder. One particular pattern did differ by sex: as they grew to adulthood, women with conduct problems suffered at high rates from serious depression.

Sex-typed adult developmental outcomes

Chapters 13 and 14 aim to compare the early-adult outcomes of males and females who had been antisocial as adolescents, examining a broad array of adult outcomes measured at age 21 in the Dunedin Study. At this age, the sequelae of conduct problems proved to be gender-typed. A conduct-problem history predicted women’s adult adjustment in relation to home life, health, and depression. In contrast, conduct problems forecast men’s adjustment in relation to work, substance abuse, and the judicial crime-control system. Both antisocial males and females were highly likely to become intimate with an antisocial mate, to produce babies while they were still in their teens, and to engage in domestic violence in their homes, thus setting the stage of risk for the next generation. One key finding was that young women’s delinquency was strongly exacerbated when they partnered

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Excerpt

[More information](#)

8 SEX DIFFERENCES IN ANTISOCIAL BEHAVIOUR

with an antisocial mate, whereas young men were not influenced in this way, a finding pointing to the importance of social influences within intimate relationships on females' antisocial behaviour.

Three diagnostic hypotheses regarding sex differences in antisocial behaviour

Chapters 12, 15, and 16 deal with three specific hypotheses that have been put forward in relation to sex differences in antisocial behaviour. Chapter 12 tests the hypothesis that girls must pass a higher threshold of risk to become as antisocial as boys (Eme, 1992), with findings that run counter to the hypothesis. Chapter 15 tests the hypothesis that the diagnostic cut-offs that define conduct disorder should be set at a lower, milder, level for girls than for boys (Zoccolillo, 1993), again with findings that indicate that this would not be justified. Chapter 16 tests the hypothesis that the taxonomy of life-course-persistent versus adolescence-limited antisocial behaviour describes the phenomena in girls as well as it does with boys (Moffitt, 1994). Although the taxonomy certainly applies in much the same way in both sexes, life-course-persistent antisocial behaviour is a distinctly uncommon phenomenon in females, most of whom fit the adolescence-limited pattern.

Synthesis and recommendations for future research

The final chapter aims to provide a synthesis of findings from earlier chapters, and lays out an agenda for future research into antisocial behaviour. In chapter 17, we conclude that the more severe, early-onset presentation of antisocial behaviour that is typical of some 5 per cent of males is associated with neuro-cognitive features and probably involves strong genetic and other biological influences. By contrast, females' antisocial involvement tends to fluctuate much more according to circumstances, suggesting that the variety of antisocial involvement that is more typical of females is particularly influenced by social factors. Indeed, in contrast to the assumption that socialization generates sex differences, we found evidence that socialization effects may generate sex similarities in antisocial behaviour. In particular, the findings point to the conclusion that, with regard to socialization influences, male peers play a prominent role in shaping the antisocial behaviour of females.

Chapter 17 derives five research priorities from the findings in this book: (1) investigating the origins of sex differences in individual-level neuro-developmental problems and the risk processes associated with them; (2) investigating the extent to which the same neuro-developmental risk factors operate in the same way across problem behaviours that show a

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Excerpt

[More information](#)

INTRODUCTION **9**

male preponderance; (3) investigating social-contextual influences on anti-social behaviour, especially influences from peers and intimate partners; (4) comparing the effects of high-risk environments on brothers and sisters, with particular attention to person–environment correlations and interactions; and (5) investigating sex differences in other problem behaviours, using strategies similar to those employed here.

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Excerpt

[More information](#)

CHAPTER TWO

The Dunedin Multidisciplinary Health and Development Study

The 1,000 young people we describe in this book are members of an unselected birth cohort that represents a wide range of social origins. Since their births in 1972–3 they have been members of an ongoing longitudinal study called the Dunedin Multidisciplinary Health and Development Study. Their problem behaviour has been assessed repeatedly during their lives, as shown in table 2.1. Although in this book we examine data from all of the assessments, from age 3 to age 21, many of the analyses focus especially on the developmental period when participation in antisocial behaviour peaks, between ages 13 and 21. Thus, the data presented here describe the behaviour of the age cohort that contributed an extremely large proportion to their nation's crime rate between 1985 and 1995.

The Dunedin Multidisciplinary Health and Development Study is ideally designed for three types of research: (1) prediction studies of the childhood correlates of later health and behaviour outcomes, (2) developmental studies of continuity and change in health and behaviour, and (3) epidemiological studies of the prevalence and incidence of health problems and behaviour problems, and associations among problem types. This book presents all three types of analysis.

Description of the research sample and Study design

Sample

The history of the Study and its design features have been described in detail in a book prepared by the team of investigators (Silva and Stanton, 1996). Briefly, the Study is a longitudinal investigation of the health, development,