Australian Institute of Family Studies

CRIME PREVENTION VICTORIA

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Patterns and precursors of adolescent antisocial behaviour

October, 2002

THE FIRST REPORT DECEMBER 2002

from the collaborative partnership between the Australian Institute of Family Studies and Crime Prevention Victoria, Department of Justice

AUSTRALIAN TEMPERAMENT PROJECT

A study of development from infancy to adulthood

Australian Institute of Family Studies

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Australian Temperament Project

The Australian Temperament Project is a large longitudinal study of children's development which began in 1983 with the enrolment of a representative sample of 2443 infants and their families from urban and rural areas of Victoria. The study investigates pathways to psychosocial adjustment from childhood to adulthood, and the influence of personal, family and environmental factors. Since early in 2000, the Australian Institute of Family Studies has been collaborating with researchers from the University of Melbourne and the Royal Children's Hospital in this ongoing research project.

Patterns and precursors of adolescent antisocial behaviour

THE FIRST REPORT DECEMBER 2002

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Australian Institute of Family Studies

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and the
Australian Temperament Project team
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Foreword

Understanding the processes by which children develop into well adjusted, law abiding citizens is crucial if we are to succeed in building safer communities. Effective crime prevention programs must be guided by sound, empirically based evidence. However, this information often takes time to collect and evidence that is available mostly relates to offending behaviour in other countries, and hence has uncertain applicability to the Victorian context.

The research presented in this First Report, *Patterns and Precursors of Adolescent Antisocial Behaviour,* is the product of a collaboration between the Australian Institute of Family Studies and Crime Prevention Victoria. The report is the culmination of six months work and describes findings from the Australian Temperament Project, a large longitudinal study which has followed a representative sample of Victorian children and their families from infancy to adolescence. It focuses on the nature and prevalence of adolescent antisocial behaviour in this sample, and examines precursors of this behaviour from infancy onwards.

This First Report makes a significant contribution to our understanding of the factors that influence the development of antisocial behaviour in Victorian adolescents. This research is particularly relevant to the Victorian Government's *Safer Streets and Homes Strategy.* It provides guidance on the nature and timing of intervention efforts aimed at redirecting children from problematic developmental pathways to pathways with more positive outcomes.

The collaborative partnership will produce a Second Report which will include an examination of factors which may protect against the development of adolescent antisocial behaviour; an analysis of the differences between adolescents who engage in violent versus non-violent antisocial acts; and an examination of the influence of neighbourhood context on engagement in adolescent antisocial behaviour.

Crime prevention research needs to be able to be translated into action. The results from this study will enable new ways of thinking about prevention and early intervention with the aim of reducing the development of antisocial behaviour. Translating research findings into practical solutions is challenging, but a substantial first step has been taken with this report.

André Haermeyer
Victorian Minister for Police and Emergency Services

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- *Inspector Bill Mathers,* Manager, Youth Advisory Unit, Victoria Police
- *Ms Julie Millar,* Senior Policy Officer, Student Welfare and Drug Education, Student Wellbeing Branch, Victorian Department of Education and Training
- *Mr John Prent,* Manager, Research and Web Services, Community Care Division, Victorian Department of Human Services
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- *Mr Stuart Ross,* Department of Criminology, University of Melbourne
- *Dr Sheldon Rothman,* Senior Research Fellow, Australian Council for Educational Research
- *Associate Professor John W Toumbourou,* Centre for Adolescent Health, Department of Paediatrics, University of Melbourne and Murdoch Childrens Research Institute
- *Mr Peter Yewers,* Manager, Student Welfare and Drug Education, Student Wellbeing Branch, Victorian Department of Education and Training.

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Preface

This report on the patterns and pathways to antisocial and criminal behaviours among Australian adolescents represents the first publication from the collaborative project between the Australian Institute of Family Studies and Crime Prevention Victoria.

The setting for the project is the longitudinal community study, the Australian Temperament Project (now in its twentieth year), which is itself a collaboration between researchers from the Institute, the Royal Children's Hospital, and the University of Melbourne.

The study involves a representative sample of more than 2400 children and families living in urban and rural areas of Victoria. With its focus on children's psychosocial development from infancy to adolescence, the study provides a rare and valuable opportunity to explore the development of teenage antisocial behaviour in an Australian context.

The origins of many problems in adolescence and adulthood can be traced back to early childhood. This report makes a substantial contribution to our understanding of how and why antisocial behaviours develop in childhood and adolescence, and identifies opportunities for assisting vulnerable youngsters to move onto more positive pathways. In doing so, it adds to the evidence base for policy and practice regarding Australian children and their families.

I commend *Patterns and Precursors of Adolescent Antisocial Behaviour* and am confident it will be of interest and value to the research community, to policy makers, and to parents, teachers and professionals who work with children and families. In particular, it is hoped that the report, in addressing current policy concerns, will facilitate government and community efforts to ensure the very best outcomes for all our children and their families.

David I. Stanton
Director
Australian Institute of Family Studies

Summary

Adolescence is a crucial time for the emergence of antisocial and criminal behaviour which, for some, persists into adulthood; at considerable cost to individuals, families and the wider community. Much research has been devoted to the identification of risk factors associated with the occurrence of criminal and antisocial behaviour, with the aim of preventing such problems. However, much of the research has been cross-sectional or covered restricted age spans, conducted in other countries, employed disadvantaged samples, and focused on males. Its applicability to the Victorian and Australian context is uncertain.

Few Australian studies have examined the precursors of and pathways to antisocial behaviour from the earliest years of life. The present study, a collaborative project between Crime Prevention Victoria (Victorian Department of Justice), and the Australian Institute of Family Studies, uses data from the Australian Temperament Project to describe patterns and precursors of antisocial behaviour among a representative community sample of Victorian adolescents.

In this report a considerable amount of statistical data is presented, so that those who are interested can examine them in detail. However, at key points throughout the report summaries of the results are provided so that those who wish can bypass the statistical details.

Australian Temperament Project

The Australian Temperament Project (ATP) is a large scale, longitudinal study that has, to date, followed Victorian children from infancy to 17-18 years of age. The initial sample comprised 2443 infants (aged 4-8 months) and their parents, who were representative of the Victorian population at that time (1983). In total, twelve waves of data have been collected, via annual or biennial mail surveys. Using age-appropriate measures, data have been collected on aspects such as the child's temperament, behavioural and emotional adjustment, academic progress, health, social skills, peer and family relationships, as well as family functioning, parenting practices and family socio-demographic background. Parents, teachers and the children themselves have acted as informants at various stages during the project. During the last three data collection waves in 1996, 1998 and 2000, when participants were aged 13-14, 15-16 and 17-18 years, adolescents answered questions regarding their engagement in antisocial acts.

Frequency of antisocial acts across the adolescent years

Antisocial behaviour was quite common among ATP participants over the period 13-14 to 17-18 years. One of the most common types of antisocial behaviour was property offences, with approximately 10-20 per cent of participants engaging in acts such as theft or vandalism. Cigarette and alcohol use were also common (39 per cent and 85 per cent respectively, at 17-18 years); however, fewer participants had used marijuana (increasing from 6 per cent at 13-14 years to 19 per cent at 17-18 years) and very few (less than 4 per cent) had used "hard drugs". Authority conflict and violent antisocial acts were much less common, with the exceptions of skipping school (a high of 43 per cent at 17-18 years) and involvement in physical fights (a high of 34 per cent at 13-14 years). About one in ten participants had been in contact with the police for offending, but only a very small number had been charged (2-3 per cent), appeared in court (about 1 per cent), or been convicted of a crime (less than 1 per cent).

Frequency of antisocial acts among males and females

Cigarette use, alcohol use, and skipping school were the most common antisocial behaviours for both males and females. A higher proportion of males than females had engaged in violent and drug-related antisocial acts such as physical fighting (for example, 52 per cent of males

at 13-14 years compared with 15 per cent females); been suspended/expelled from school (ranging from 6 to 9 per cent males compared with 2 to 4 per cent of females); committed property offences such as driving a car without permission (5-19 per cent males; 2-11 per cent females) and damaging property (19-32 per cent males; 8-11 per cent females); and been in contact with the criminal justice system (for example,19 per cent males and 6-8 per cent females had been in contact with the police for offending). Females, on the other hand, were more likely than males to have engaged in graffiti during early adolescence (11 per cent females compared with 7 per cent males at 13-14 years).

Patterns of antisocial behaviour over time

Different patterns of antisocial behaviour were identified among participants over 13-14, 15-16 and 17-18 years of age, leading to the formation of three groups. These were: 844 "*Low/non antisocial"* (those who exhibited no or low levels of antisocial behaviour at all timepoints); 88 "*Experimental"* (those who exhibited high antisocial behaviour – three or more different antisocial acts in the past year – at only one timepoint during early-to-mid adolescence); and 131 "*Persistent"* (those who reported high antisocial behaviour – three or more different antisocial acts in the past year – at two or more timepoints, including the last data collection wave at 17-18 years). A further 103 were not included, as they did not fit the criteria for the three groups.

Predictors of antisocial behaviour across time

No significant differences were found between the two antisocial groups and the *low/non antisocial* group during infancy and early childhood. The first group differences emerged at the beginning of primary school (5-6 years). Clear and consistent differences between the *persistent* and *low/non antisocial* groups were observed from this time on. During mid childhood, the *persistent antisocial* group had higher levels of acting out, aggressive and hyperactive behaviour problems, and were more inclined to display volatility and to experience difficulties in maintaining attention than the *low/non antisocial* group. In late childhood, the *persistent antisocial* group continued to display problematic behaviour, and in addition were less cooperative, had poorer self-control, had poorer relationships with parents, and were more likely to have friends who engaged in antisocial behaviour.

The *experimental* and *low/non antisocial* groups did not differ significantly until early adolescence. During adolescence, the *experimental* group resembled the *persistent* group on many domains, although generally was less dysfunctional. The two antisocial groups were significantly more problematic than the *low/non antisocial* group on a wide range of domains, including school progress, attraction to risk taking, coping styles, parent-child relationships, and parenting style. Towards the end of adolescence, this pattern of differences appeared to change, with the *experimental* group becoming more similar to the *low/non antisocial* group.

Predictors of antisocial behaviour across domains of functioning

Group differences typically centred on temperamental characteristics such as negativity, volatility and low persistence, as well as aggressive, acting out and hyperactive behaviour problems, to the disadvantage of the antisocial groups. Powerful group differences were also observed in the domains of social competence, association with antisocial peers, school adjustment during adolescence, coping styles and involvement in risk-taking activities. Less powerful but significant group differences were also observed in family structural characteristics, parenting practices, and family relationships.

Gender differences in the predictors of antisocial behaviour

The effects of gender on the prediction of antisocial behaviour were investigated by (1) controlling for the effects of gender, and (2) conducting separate analyses for males and females. These analyses revealed a similar pattern of results to those described above, however, group differences during the early to mid primary school years were generally fewer, when sex-specific analyses were conducted.

Key findings

1. *Some degree of antisocial behaviour is "normal" in adolescence*
   Consistent with previous research, the findings of this study suggest that some degree of antisocial behaviour is common among adolescents. However, there are distinct patterns both in the timing, the frequency, and the nature of the antisocial behaviours, which need to be taken into consideration by prevention strategies.

2. *Early interventions to divert children from pathways to persistent antisocial behaviour are most appropriate during the primary school years for the majority of young people*
   The current findings suggest that parents, teachers, clinicians and policy makers should focus on the early primary school years as a critical time for intervention in attempting to prevent the development of *persistent* antisocial behaviour. In this study, group differences first emerged at the age of 5 to 6 years (the commencement of primary school for most participants), suggesting that this period represents an early point in developmental pathways for the majority of children.

   It is widely recognised that interventions during the earliest years of life are critical for the prevention of numerous emotional and behavioural problems (for example, hyperactivity, attention-regulation problems). Hence, more broad-based interventions (for example, home visiting programs), during infancy and early childhood, which aim to prevent the development of problems before they emerge, may also prove beneficial. Infants and young children whose sociodemographic and familial characteristics place them at increased risk of later developing antisocial behaviour would particularly benefit from such preventative efforts. Nevertheless, the current results suggest that when targeting the pathways to persistent antisocial behaviour, the focus should be on the early primary school years as a crucial period to intervene.

3. *Persistent antisocial youth exhibit a clear profile*
   Individuals who went on to engage in *persistent* antisocial behaviour during adolescence were consistently reported to be more aggressive, more disinhibited, and more temperamentally reactive from mid-childhood onwards than individuals who later engaged in little or no antisocial behaviour. Furthermore, from late childhood, this group exhibited lower social competence, and associated more frequently with antisocial peers. Given the consistency of these findings, it may be possible to identify children who are at risk of developing *persistent* antisocial behaviour at quite a young age, for whom targeted interventions may be beneficial.

4. *Interventions targeting experimental antisocial behaviour need to be multi-faceted and focus on the early secondary school years*
   Individuals who engaged in transitory antisocial behaviour during mid adolescence had shown clear signs of dysfunction from the early adolescent years, following the transition to secondary school. While they showed no signs of adjustment difficulties and were similar to the *low/non antisocial* group during childhood, in the early adolescent years they became more "difficult" temperamentally, more aggressive, began to experience difficulties at home and at school, and were likely to have formed friendships with youth who also engaged in antisocial behaviour. Due to the wide range of difficulties exhibited by individuals displaying *experimental* antisocial behaviour, interventions aimed at preventing this type of behaviour should be multi-faceted and targeted at the early secondary school years. It will be important to follow the trajectory of this group into young adulthood, to ascertain if their problems were truly transitory.

5. *Precursors of antisocial behaviour are similar for males and females*
   When differences between antisocial groups were examined separately for males and females, differences generally emerged at the same times and in the same domains for both sexes. These findings suggest that interventions aimed at preventing the development of antisocial behaviour may be used equally well with males and females.

6. *Peer relationships and their influence*
   The existence of friendships with other antisocial youth was one of the most powerful risk factors for both persistent and experimental antisocial behaviour identified by this study. Such

friendships were evident from as early as 11-12 years of age, and prior to the onset of antisocial behaviour. Other aspects of peer relationships also appeared important. The *low/non antisocial* group members were more attached to their peers (had greater trust and communication), and more frequently interacted with peers in a structured setting (for example, while playing sport). The two antisocial groups, on the other hand, appeared to spend more time with peers, but their time together was more likely to be unstructured.

7. *The role of family environment*
   There were few significant differences between the three groups on socio-demographic characteristics such as family socioeconomic status, parental education, occupational, and ethnic background, and number of children in the family. However, within-family processes, (for example, the parent-child relationship, the degree of warmth and conflict in this relationship, alienation from parents, family cohesion, and marital conflict and breakdown) were important contributors to group differences. Parenting style was also important, with parents of antisocial youth more prone to use lower supervision, less warmth and more harsh discipline. In general, family environment factors were less powerful in impact than individual child characteristics.

8. *The importance of school adjustment*
   Clear group differences in school adjustment and school bonding were evident during the secondary school years. Both the *persistent* and *experimental* groups were observed to have more difficulties adjusting to school, and to exhibit lower levels of attachment to school, than those in the *low/non antisocial* group. These findings suggest that the manner in which an individual adapts to the school environment, the way in which the school accommodates the child's individual characteristics and needs, and adolescents' attitudes about schooling, are important predictors of adolescent antisocial behaviour.

In summary, this First Report has documented substantial group differences between adolescents who engage in high levels of antisocial behaviour and those who do not, which are evident from the early primary school years on, and increase in strength and diversity over time. The most powerful group differences emerge in intra-individual characteristics such as temperament, behaviour problems, social skills, levels of risk-taking behaviour and coping skills, and in the domains of school adjustment and peer relationships. Significant group differences in aspects of the family environment were also found. These findings have important implications for the content and timing of interventions aimed at preventing the development of antisocial behaviour.

A later report will include an examination of differences between adolescents who engage in violent antisocial acts versus those who engage in non-violent antisocial acts, an investigation of factors which may have a protective effect against the development of adolescent antisocial behaviour, and an investigation of location effects on adolescent antisocial behaviour.

1 *Introduction*

This report is the product of the collaborative partnership between the Australian Institute of Family Studies and Crime Prevention Victoria. The partnership began in 2001 when Crime Prevention Victoria commissioned the Institute to analyse and collect data from the Australian Temperament Project concerning the development of adolescent and young adult antisocial and criminal behaviour. This report provides valuable new information, which it is hoped will improve our understanding of the factors that place an individual at risk of engaging in this type of behaviour and, in turn, inform early intervention efforts aimed at diverting individuals away from problematic pathways.

Adolescence is a critical period for the emergence and entrenchment of antisocial behaviours (including criminal behaviours), which for some, persist into adulthood and entail substantial costs for individuals, families and the community. It is widely recognised that early intervention and prevention can curtail the development of these problems and is preferable to reacting after the problem behaviour has become established. Greater success in universal and targeted interventions is predicated on improved understanding of the genesis of such behaviour. The Australian Temperament Project, a large scale longitudinal study, with twelve waves of data spanning the first eighteen years of life, provides a valuable opportunity to investigate the precursors of antisocial behaviour among Australian adolescents, and to examine a broad range of risk factors across developmental stages and domains of functioning.

The focus of this first report is on adolescent antisocial behaviour, which includes criminal acts such as theft or the selling of drugs, and dysfunctional behaviours[1] such as running away from home or physical aggression. A brief overview of the research into adolescent antisocial behaviour is first presented, followed by a summary of the findings emerging from the current study and a discussion of their implications for the understanding of antisocial behaviour, as well as for policy development and early intervention and prevention efforts. For those interested in more a more detailed description of the findings, the appendices for this report can be obtained electronically from Crime Prevention Victoria's website, www.crimeprevention.vic.gov.au.

Nature and extent of adolescent antisocial behaviour

Information regarding the frequency and nature of antisocial behaviour among young people is typically obtained from a number of sources: (1) official statistics obtained from the criminal justice agencies (that is, police and courts), or (2) self-reported behaviour, generally obtained during the course of interviews or surveys (Rutter, Giller and Hagell 1998). Both types of information have advantages and disadvantages. Official statistics provide a measure of behaviours reported to and recorded by police. However, they provide a conservative assessment, since a high proportion of those committing antisocial acts are not apprehended, and many minor antisocial behaviours may not attract or warrant attention by authorities. Furthermore, particular groups, such as those from disadvantaged families and neighbourhoods, may be more likely to be the focus of official attention and hence have a greater likelihood of being apprehended (Rutter et al. 1998). Thus, official records provide an incomplete picture of the incidence of antisocial behaviours across different sections of the community.

Self-report has the potential to provide a more comprehensive picture and can cover a wider array of antisocial acts (not just those that are illegal), but may be affected by social desirability and other biases. It relies on the willingness of individuals to reveal potentially compromising information, and on respondents' veracity and memory. It is also reliant on the representativeness of the sample used, and researchers' ability to reach and engage the young people involved in serious antisocial acts. While recognising the advantages and disadvantages of both approaches, the current report focuses on adolescents' self-reported antisocial behaviour.

Antisocial behaviour among Australian adolescents

Studies examining rates of antisocial behaviour among Australian adolescents have found that it is very common for them to engage in some level of antisocial behaviour.

For example, in 1996, 441,234 New South Wales secondary school students in Years 7 to 12 were surveyed about their involvement in antisocial activities (Baker 1998). Close to 40 per cent of all students admitted to having attacked someone with the idea of hurting them at some time in their life, 38.6 per cent reported having purposely damaged or destroyed someone else's property, and over a fifth (22.8 per cent) had received or sold stolen goods. Significant age and gender differences were found, with rates for all types of offences peaking around Years 9 and 10 (14-16 years), and males reporting higher rates of each offence type, in each year level, almost without exception.

1 Behaviours which fit the criteria for a diagnosis of Conduct Disorder according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994)

Further evidence of the high frequency of antisocial behaviour among Australian adolescents can be found in a Victorian survey of 8,984 Year 7, 9 and 11 students (Bond, Thomas, Toumbourou, Patton and Catalano 2000). Rates of antisocial behaviour generally increased from Years 7 to 9, but were relatively stable from Year 9 to Year 11. Consistent with Baker's (1998) findings, the peak incidence for most offences was in Year 9. The most common antisocial behaviours Year 9 students reported having been involved in during the past year were: stealing from a shop (30 per cent), engaging in graffiti (23 per cent), participating in a fight or a riot (18 per cent), carrying a weapon (18 per cent), and handling stolen property (18 per cent).

While these two studies used different time frames to assess engagement in antisocial behaviour (lifetime vs within the past year), some consistent trends are evident, particularly the escalation and peaking of antisocial behaviour in the mid teens. These trends are also reflected in official statistics (See Table 1).

Table 1 **Official statistics relating to antisocial behaviour among young people in Victoria, Australia.**

■ 16.5% of all persons proceeded against by Victoria Police in 2000/01 were aged between 10-16 years, compared with 38.2% who were aged 17-24 years, and 45.3% who were aged 25 years or over.
■ 10-24 year-olds comprised approximately one-third of persons proceeded against for homicide and rape, half of all persons proceeded against for assault, and almost 60% of persons proceeded against for property offences.
■ 15-19 years or 20-24 years are the peak ages of offending for homicide, assault, fraud, theft, burglary, vandalism and drug offences.
■ 4-5 times as many young males are proceeded against by Victoria Police than young females.

Source: Victoria Police, Statistical Services Branch (2002).

Comparisons with international data

Studies that have examined rates of self-reported antisocial behaviour among adolescents in other countries have found similar patterns to those identified in Australia. That is, some degree of antisocial behaviour appears to be quite common among adolescents (Baker 1998; Rutter et al. 1998), to be more frequent among males than females, and typically peaks during mid-to-late adolescence. Nevertheless, there is considerable variation in rates across countries (Rutter et al. 1998). However, it should be noted that methodological differences between studies (for example, the representativeness of the sample employed, the measures of antisocial behaviour used, the time period during which participants were surveyed) make it difficult to directly compare rates of self-reported behaviour in different countries.

In summary, antisocial behaviour is common in adolescence. It ranges from relatively minor to quite serious acts, typically peaks during mid-to-late adolescence, and is more common among males than females. It has potentially serious consequences for adolescents both in the present and the future (Moffitt, Caspi, Harrington and Milne 2002), and impacts on their families and wider society (Homel et al. 1999).

Patterns of antisocial behaviour

In addition to investigating the nature and extent of antisocial behaviour in the community, considerable research has focused on differentiating between young people who exhibit distinct patterns of antisocial behaviour. Two such patterns, violent versus non-violent antisocial behaviour, and persistent versus experimental antisocial behaviour, will now be discussed.

Violent versus non-violent

Considerable research supports the notion that violent offenders are a small but distinct group from those who engage in non-violent antisocial or criminal behaviour (Farrington and Loeber 2000; Loeber, Farrington, Rumsey, Kerr, Allen-Hagan 1998; Maughan, Pickles, Rowe, Costello and Angold 2000; Nagin and Tremblay 1999).

A comprehensive literature review undertaken by the United States Office of Juvenile Justice and Delinquency Prevention's Study Group on Serious and Violent Juvenile Offenders (Loeber et al. 1998) revealed a number of key differences between violent and non-violent offenders. These included the findings that: violent offenders are typically male; the majority of violent offenders tend to start offending earlier, and continue offending longer, than non-violent offenders; violent offenders tend to exhibit multiple problem behaviours (for example, substance use, mental health difficulties, authority conflict problems, aggression etc); and violent offenders tend to commit a range of aggressive and non-aggressive offences.

Further support for a differentiation between violent and non-violent offenders can be found in research that has attempted to chart developmental pathways to antisocial behaviour. For example, Maughan and colleagues (2000) examined the development of aggressive and non-aggressive conduct problems in a sample of 1419 American boys and girls. These authors found only a small degree of overlap between the developmental pathways for the aggressive and non-aggressive children. Similarly, a Canadian study of 1,037 males (Nagin and Tremblay 1998) identified unique developmental pathways for those who engaged in overt delinquency (for example, physical violence) and those who engaged in covert delinquency (for example, theft) during adolescence.

Nevertheless, some have argued against this distinction. Piquero (2000), for example, claims that the difference between violent and non-violent offenders is quantitative not qualitative. Piquero (2000) notes the consistent finding that violent offenders tend

to commit more offences than non-violent offenders. Based on this observation, he suggests that the difference between these groups is more a matter of degree than type, in which case the correlates of one type of offence should be the same as another. Piquero (2000) tested this hypothesis on data from a sample of 987 American adolescents. After controlling for frequency of offending he found that only one variable differentially predicted violent, but not non-violent offending, namely, variation in intelligence test scores. Individuals with low intelligence scores were more likely to come into police contact for a violent offence by age 18 than those who scored highly on this measure.

While researchers should remain open to the idea that the difference between violent and non-violent offenders may be one of degree, differentiation into these subtypes appears to be a useful strategy for investigating the developmental pathways to adolescent antisocial behaviour.

Experimental versus persistent

Another distinction frequently made in the research literature relates to the stability or transient nature of antisocial behaviour.

Childhood and adolescence are periods of high experimentation, during which many young people engage in behaviours that are not pro-social (for example, shoplifting, lying, bullying, annoying peers etc) (Kelley, Loeber, Keenan, DeLamatre 1997). Nevertheless, while many young people act in an antisocial manner, this behaviour is usually transitory (Dussuyer and Mammalito 1998; Kelley et al. 1997; Moffitt and Harrington 1996). Individuals who engage in antisocial behaviour for a relatively short period of time and then desist, are often referred to as "experimenters". On the other hand, for a small group of people, antisocial behaviour is much more stable (Kelley et al. 1997; Moffitt and Harrington 1996), often beginning at a very early age and continuing well into adulthood. Those who maintain high levels of antisocial behaviour over long time periods are often labelled "persisters".

Consistent with the experimental – persistent distinction, Moffitt and colleagues (Moffitt and Harrington 1996; Moffitt, Caspi, Rutter and Silva 2001) propose two broad categories of antisocial behaviour: "*life-course persistent" antisocial behaviour* (which emerges early in life and persists well into adulthood); and *"adolescent-limited" antisocial behaviour* (which emerges alongside puberty and is transitory). According to these authors, adolescent-limited antisocial behaviour is quite common and may have few long-term deleterious consequences, whereas relatively few young people engage in life-course persistent antisocial behaviour.

Moffitt and colleagues (2001) tested this taxonomy in a sample of 922 males and females from the Dunedin Multidisciplinary Health and Development Study. They found that 200 participants fulfilled the criteria for adolescent-limited antisocial behaviour, whereas 53 met the criteria for life-course persistent antisocial behaviour. Life-course persistent antisocial behaviour was considerably more common among males than females, with approximately 10 males to every female displaying this pattern of antisocial behaviour, whereas the gender difference in adolescent-limited antisocial behaviour was small (1.5:1 males to females).

This distinction appears to be a critical one. However, relatively few studies have the requisite longitudinal data to allow the differentiation of such groups. The Australian Temperament Project, with data available at multiple timepoints from infancy onwards, has the capacity to investigate this important issue.

Theoretical models

Many models have been proposed to explain the development of antisocial behaviour. Some models propose different pathways leading to the development of antisocial behaviour. For example, Loeber and colleagues (Loeber, Wung, Keenan, Giroux, Stouthamer-Loeber, Van Kammen, and Maughan 1993) suggest that three different pathways can explain the development of antisocial behaviour in males. The first of these, the *overt pathway*, involves an escalation in aggressive acts (for example, minor aggression → physical fighting → physical violence) over time; the second, *the covert pathway*, involves an escalation in less overt antisocial acts (for example, minor covert behaviours → property damage → moderate to severe delinquency); while the third pathway, *the authority conflict pathway*, involves a sequence of stubborn behaviour, leading to defiance, and ultimately authority avoidance (for example, running away from home, truancy). Less serious behaviours precede more serious behaviours in these pathways and boys may proceed along more than one pathway at a time.

The Social Development model of Catalano and Hawkins (1996) emphasises the role of social learning in the development of antisocial behaviour. According to this model, children learn patterns of behaviour, whether they are prosocial or antisocial, from their family, their school, religious and other community institutions, and their peers. Hence, an individual's behaviour is determined by the predominant behaviours, norms and values held by those to whom the individual is attached. Consequently, youth attachment to prosocial individuals, developed particularly through involvement in rewarding experiences, is posited to be protective against the development of antisocial behaviours, conduct problems and substance use.

Weatherburn and Lind (2001) propose a role for economic stress in the development of criminal behaviour. According to their model, parents who experience higher levels of economic stress are more likely to neglect or abuse their children or engage in harsh, erratic and inconsistent disciplinary practices than other parents. This kind of parenting behaviour may lead a child to affiliate more strongly with their peers than their parents, making the child susceptible to the negative influence of antisocial peers. The effects of economic stress are reduced when parents have a strong social support network, but increase if such a support network is absent, or other sources of stress are present (for example, crowded household, large family, "difficult child", family conflict, parental disorder).

Patterson, Reid and Dishion (1992) also suggest a critical role for parenting in the development of antisocial behaviour among males. They suggest that individuals who experience poor "basic training" as children are more susceptible to poor academic performance and peer rejection later on. These problems may lead to association with antisocial peers and engagement in antisocial acts in adolescence, and eventually, to poor adjustment in adulthood.

It should be noted that many of these "pathways" models have been developed to explain antisocial behaviour among males, with relatively little attention to antisocial behaviour among females.

Another approach to understanding the development of antisocial behaviour is the *Risk Factors* approach. A large body of research has been dedicated to the identification of risk and protective factors associated with the development of antisocial behaviour. Risk factors can be defined as those factors that "increase(s) the likelihood that a subsequent negative outcome will occur" (Loeber, 1990: 4), whereas protective factors operate in the context of risk and "offset risk factors and promote social development, well-being and resilience" (Bond et al. 2000: 3).

Risk and protective factors associated with the development of antisocial and criminal behaviour can occur across a number of domains. These include the characteristics of the child, the family and its experience of stressful life events, the school context, and community and cultural factors (Homel et al. 1999). The risk and protective factors that have most frequently been found to be associated with the development of antisocial and criminal behaviour are summarised in Tables 2 and 3, respectively.

Research suggests that no single risk factor can explain the development of antisocial behaviour. Rather, the more risk factors an individual is exposed to, the greater the likelihood that he or she will exhibit antisocial or criminal behaviour (Bond et al. 2000; Loeber and Farrington 2000). Similarly, the greater the number of protective factors possessed by a young person, the more likely he or she is to display resilience despite the presence of risk (Howard and Johnson 2000). Hence, the risk of a child becoming antisocial appears to be dependent upon the balance of risk and protective factors in their lives (Loeber and Farrington 2000).

Table 2 Risk factors associated with antisocial behaviour

Risk Factors				
Child factors	**Family factors**	**School context**	**Life events**	**Community and cultural factors**
prematurity low birth rate disability prenatal brain damage birth injury low intelligence difficult temperament chronic illness insecure attachment poor problem solving beliefs about aggression attributions poor social skills low self esteem lack of empathy alienation hyperactivity/disruptive behaviour impulsivity	*Parental characteristics:* teenage mothers single parents psychiatric disorder. especially depression substance abuse criminality antisocial models *Family environment:* family violence and disharmony marital discord disorganised negative interaction/ social isolation large family size father absence long term parental unemployment *Parenting style:* poor supervision and monitoring of child discipline style (harsh or inconsistent) rejection of child abuse lack of warmth and affection low involvement in child's activities neglect	school failure normative beliefs about aggression deviant peer group bullying peer rejection poor attachment to school inadequate behaviour management	divorce and family break up war or natural disasters death of a family member	socioeconomic disadvantage population density and housing conditions urban area neighbourhood violence and crime cultural norms concerning violence as acceptable response to frustration media portrayal of violence lack of support services social or cultural discrimination

Source: Homel, Cashmore, Gilmore, Goodnow, Hayes, Lawrence, Leech, O'Connor, Vinson, Najman, & Western, 1999, p136. Reproduced with the kind permission of the Commonwealth Attorney-General's Department.

This approach emphasises the accumulation of risks as critical and treats the various risks factors as of equivalent importance. The question of whether different types of risks, or clusters of risk factors, have differential impacts remains as yet unanswered.

These are only some of the models that have been proposed to explain the development of antisocial and criminal behaviour. The current report does not try to provide a comprehensive review of current theoretical models. Rather, here we focus on one of the most widely used theoretical approaches in this field, the Risk Factor approach.

The present study

It is notable that much of the research into adolescent antisocial behaviour has been conducted in the United States, with influential work also originating in the United Kingdom, Europe, Canada and New Zealand. In addition, much of the research is based on samples suffering social and economic disadvantage, and focuses primarily on males. Hence, the applicability of such research to the Australian context, to individuals in the general population, and to females, is uncertain.

There are very few Australian studies which have examined the pathways to antisocial behaviour from the early years onwards (an exception being Bor, Najman, O'Callaghan, Williams and Anstey 2001) although valuable research investigating more proximal influences has been conducted (for example, Baker 1998; Bond et al 2000; Homel et al. 1999; Weatherburn and Lind 2001 etc). Thus, our understanding of the precursors of and pathways to antisocial behaviour among Australian adolescents is very limited at present.

The present study attempts to redress this by analysing data on a sample of males and females representative of the general community who have been followed from infancy (4-8 months of age) into young adulthood. The Australian Temperament Project data set provides a valuable opportunity to investigate a wide range of risk factors for antisocial behaviour. The findings will provide guidance for early intervention and crime prevention efforts.

Table 3 **Protective factors associated with antisocial behaviour**

Protective Factors				
Child factors	**Family factors**	**School context**	**Life events**	**Community and cultural factors**
social competence social skills above average inteligance attachment to family empathy problem solving optimism school achievement easy temperament internal focus of control moral beliefs values self related cognitions good coping style	supportive caring parents family harmony more than two years between siblings responsibility for chores or required helpfulness secure and stable family supportive relationship with other adult small family size strong family norms and morality	positive school climate prosocial peer group responsibility and required helpfulness sense of belonging/ bonding opportunities for some success at school and recognition of achievement school norms re violence	meeting significant person moving to new area opportunities at critical turning points or major life transitions	access to support services community networking attachment to the community participation in church or other community group community/cultural norms against violence a strong cultural identity and ethnic pride

Source: Homel, Cashmore, Gilmore, Goodnow, Hayes, Lawrence, Leech, O'Connor, Vinson, Najman, & Western, 1999, p138. Reproduced with the kind permission of the Commonwealth Attorney-General's Department.

2 The Australian Temperament Project

The Australian Temperament Project (ATP) is a longitudinal study of the psychosocial development of a large, representative sample of children born in Victoria between September 1982 and January 1983 (see Prior, Sanson, Smart and Oberklaid 2000 for a fuller account). Twelve waves of data on the children's temperament, behavioural and emotional adjustment, academic progress, health, social skills, peer and family relationships have been collected via annual or biennial mail surveys, with the aim of tracing the pathways to psychosocial adjustment and maladjustment across the children's lifespan.

A cohort of 2443 families from urban and rural areas was initially recruited via the following process. A stratified sample of Local Government Authority (LGA) areas, drawn to be representative of the state population, was developed using census data provided by the Australian Bureau of Statistics. All families with an infant of 4 to 8 months of age who attended a Maternal and Child Health Centre in one these LGAs during the first two weeks in May 1983 were invited to take part in the project. Comparison of the demographic profile of the cohort to census data showed that the obtained cohort was representative of the state's population. Approximately two-thirds of the original cohort continue to participate in the study after 18 years (N = 1650). Although there is an over-representation of low SES and ethnic families among those no longer participating, there are no significant differences between the retained and lost/withdrawn samples on any child characteristic assessed at infancy, and the family socio-economic profiles of the original and retained sample are very similar (Prior, Sanson, Smart and Oberklaid 1999). At each survey wave, the response rates have been approximately 80 per cent from those participating at that particular timepoint.

Parents have completed questionnaires about the child's functioning and aspects of their family life at every timepoint. Primary school teachers have supplied information about the ATP child in their class at the Preparatory Grade, Grade 2 and Grade 6 stages via mail surveys assessing a range of academic and individual child characteristics. From the age of 11-12 years (Grade 6), the children have completed questionnaires about their personal functioning, relationships with others, and beliefs and attitudes. Table 4 (pp.6-11) summarises the major domains assessed at each data wave. For most domains and at most survey waves, data are available from multiple sources.

In the three latest waves of data, at ages 13-14 years, 15-16 years and 17-18 years (that is, the years 1996, 1998, and 2000), adolescents answered questions about the incidence of antisocial behaviours, via an adaptation of the Self Report Delinquency Scale (Moffitt and Silva 1988).

In the sections that follow, we report the results emerging from the study and discuss their theoretical, preventative and early intervention implications. We present descriptive data on the frequency of antisocial behaviour during the adolescent years for the total sample, and for males and females separately. Following this, we report the identification and comparison of groups of persistently antisocial, transiently antisocial and non-antisocial youth. Finally, we investigate the relative impact of different types of risk factors and report analyses investigating gender differences.

Table 4 Domains and dimensions assessed in the Australian Temperament Project

Age	Source of report	Domain	Construct/variable
4-8 Months 1983	**Parent**	Temperament	■ Approach/sociability e.g. the baby's first reaction to approach by strangers is acceptance ■ Cooperation/Manageability e.g. lies still during procedures like hair brushing or nail cutting ■ Rhythmicity e.g. gets sleepy at about the same time each evening (within half an hour) ■ Activity/Reactivity e.g. displays much feeling (strong laugh or cry) during changing or dressing ■ Irritability e.g. continues to cry in spite of several minutes of soothing
		Relationship Quality	■ Mother's Overall Rating of child difficulty (MOR)
		Behaviour Problems	e.g. sleeping difficulties, colic, excessive crying
		Family demographics	■ Child birth order ■ Parents' marital status ■ Parental age at birth of ATP child ■ Parental ethnic background ■ Parental occupation ■ Parental education

continued ➤

Table 4 continued

Age	Source of report	Domain	Construct/variable
		Family Socio-Economic Status (SES)	■ A composite of maternal and paternal education and occupation rankings.
	Infant welfare sister	Birth & developmental history	■ Gestational age ■ Birth weight
		Relationship Quality	■ Nurse's Overall Rating of child difficulty (NOR) ■ Mother-baby pair relationship
1-2 Years; 2/3rds sampled 1984	**Parent**	Temperament	■ Approach/sociability e.g. the child smiles when unfamiliar adults play with him/her ■ Cooperation/Manageability e.g. remains pleasant when hungry and waiting for food to be prepared ■ Rhythmicity e.g. eats about the same amount of solid food at meals from day to day ■ Reactivity e.g. responds to frustration intensely (screams, yells) ■ Persistence e.g. stops to examine new objects thoroughly (5 minutes or more) ■ Distractibility e.g. stops play and watches when someone walks by
		Behaviour Problems	e.g. temper tantrums, excessive shyness, attention problems
		Relationship Quality	MOR; as at 4-8 months
		Family SES	As at 4-8 months
2-3 Years; 2/3rds sampled 1985	**Parent**	Temperament	As at 1-2 years
		Behaviour Problems	■ As at 1-2 years ■ Behaviour Checklist e.g. worries, fearful, concentration, overactivity, hard to manage ■ Aggression Questionnaire e.g. hurts other children by hitting, biting scratching, hits out if cannot get own way
		Relationship Quality	MOR; as at 4-8 months
		Family SES	As at 1-2 years
3-4 Years; 1986	**Parent**	Temperament	■ Inflexibility e.g. when upset or annoyed with a task, throws it down, cries, slams doors etc ■ Persistence e.g. likes to complete one task or activity before going on to the next ■ Approach e.g. is shy with strange adults ■ Rhythmicity e.g. asks for or takes a snack at about the same time each day
		Behaviour Problems	■ Aggression e.g. destroys belongings, fights ■ Hyperactivity e.g. squirmy, fidgety, can't attend for long ■ Anxious-Fearful e.g. worries about many things, appears miserable, unhappy, tearful or distressed
		Physical and language development	e.g. hearing problems, slow to talk, speech hard to understand
		Family SES	As at 1-2 years
5-6 Years 1988	**Parent**	Temperament	As at 3-4 years
		Behaviour Problems	As at 3-4 years
		Relationship Quality	MOR; as at 4-8 months
	Teacher	Temperament	■ Task orientation e.g. if an activity is interrupted, tries to go back to the activity ■ Reactivity e.g. overreacts (becomes very upset) in a stressful situation ■ Flexibility e.g. if initially hesitant about entering into new games and activities, gets over this quickly
		Behaviour Problems	■ Aggression e.g. frequently fights or is extremely quarrelsome with other children ■ Hyperactivity e.g. very restless, has difficulty staying seated for long ■ Anxious-Fearful e.g. often worried, worries about many things
		School Readiness	e.g. cooperation with other children, relationship with teacher, self reliance, physical coordination

continued ➤

Table 4 continued

Age	Source of report	Domain	Construct/variable
7-8 Years 1990	**Parent**	Temperament	As at 3-4 years
		Behaviour Problems	As at 5-6 years
		Relationship Quality	MOR; as at 4-8 months
		Family SES	As at 1-2 years
		Family Stress	■ Events that occurred in the last 12 months that had a negative impact on the family e.g. health, financial, marital problems ■ Parents' perception of life difficulty ■ Parents ability to cope with life
	Teacher	Temperament	As at 5-6 years
		Behaviour Problems	As at 5-6 years
		Social Competance	■ Aggression e.g. gets in a fight ■ Social Relationships e.g. popular ■ Academic Competence e.g. good at maths
		Reading	ACER Word Knowledge test , assessing reading skills - select from 3 alternatives the word closest in meaning to a target word; e.g. 'tale' and 'end-story-sleep'
9-10 Years 1992	**Parent**	Temperament	■ Emotionality e.g. cries easily, tends to be emotional ■ Shyness e.g. takes a long time to warm up to strangers ■ Sociability e.g. likes to be with people ■ Activity e.g. is always on the go
		Behaviour Problems	As at 5-6 years
		Relationship Quality	MOR; as at 4-8 months
		Social Behaviour	■ Confidence/ leadership e.g. is a leader among his/her friends ■ Empathy e.g. is a kind and caring person
		Family SES	As at 1-2 years
		Family Stress	Total number of events in the past year that have had a negative effect on the family
11-12 Years 1994	**Parent**	Temperament	■ Negative reactivity e.g. gets angry even when mildly criticised ■ Approach e.g. when meeting new children, is shy ■ Persistence e.g. remembers to do homework without being reminded ■ Activity e.g. runs to get to where s/he wants to go
		Behaviour Problems	As at 5-6 years; also ■ Depression e.g. talks about feeling worthless, useless, dumb, ugly or that s/he is no good at all
		Relationship Quality	MOR; as at 4-8 months
		Social Skills	■ Assertiveness e.g. starts conversations rather than waiting for others to talk first ■ Cooperation e.g. keeps room clean and neat without being reminded ■ Self control e.g. receives criticism well ■ Responsibility e.g. requests permission before leaving the house
		Peer Relationships	e.g. plays or talks with peers for extended periods of time, interacts with a number of different peers
		Antisocial peer affiliations	e.g. Has friends who fight, steal, use drugs
		Family demographics	■ Number of children in the family ■ Maternal and paternal occupation ■ Maternal and paternal education
		Family Stress	As at 9-10 years
	Teacher	Temperament	Task orientation; As at 5-6 years
		Behaviour Problems	As at 5-6 years; also Depression (parallel items to parent scale)
		Social Skills	■ Assertiveness e.g. says nice things about him/herself ■ Cooperation e.g. uses free time acceptably ■ Self control e.g. controls temper when in conflict with peers
		Academic Competence	e.g. reading and mathematics achievement, motivation, overall academic performance
		Peer relationships	As for parent report 11-12 years

continued ➤

Table 4 continued

Age	Source of report	Domain	Construct/variable
11-12 Years 1994 cont.	**Child**	Behaviour Problems	Parallel form of parent report at 11-12 years ■ Aggression e.g. I fight with other children ■ Hyperactivity e.g. I am squirmy, fidgety ■ Anxious-Fearful e.g. I feel worried, worry about lots of things ■ Depression e.g. I feel 'down', useless, dumb, no good at all
		Social Skills	■ Assertiveness e.g. start talks with classmates ■ Cooperation e.g. do homework on time ■ Self control e.g. control my temper when others are angry with me ■ Empathy e.g. feel sorry for others when bad things happen to them
		Peer relationships	■ Interaction Frequency e.g. how often spend free time with friends ■ Positive relationships e.g. tell friends secrets, tell them something important that wouldn't tell others ■ Negative relationships e.g. get into arguments with friends, friend tries to boss child
		Self Concept	■ Peer relationships e.g. have lots of friends, others want me to be their friend ■ Parent relationships e.g. get along well with parents, my parents understand me
12-13 Years 1995	**Parent**	Temperament	As at 11-12 years
		Behaviour Problems	As at 11-12 years
		Relationship Quality	MOR; as at 4-8 months
		Academic & Social Progress at School	e.g. understand the work in class, manage school rules and routines, finish assignments and homework
		Family SES	As at 1-2 years
		Family Stress	As at 9-10 years
	Child	Behaviour Problems	As at 11-12 years
		Social Skills	As at 11-12 years
		Eating attitudes and behaviour	■ Body dissatisfaction e.g. happy with the shape of body, thighs are too big ■ Drive for Thinness e.g. think about dieting, scared of gaining weight ■ Bulimia e.g. stuff myself with food, think about bingeing
		Self Concept	About physical appearance e.g. have a good looking body, am better looking than my friends
		Academic & Social Progress at School	Parallel scale to Parent scale at 12-13 years
13-14 Years 1996	**Parent**	Temperament	As at 11-12 years
		Behaviour Problems	■ Conduct Disorder e.g. disruptive, annoys or bothers others ■ Socialised Aggression e.g. steals in company with others ■ Attention problems e.g. short attention span, poor concentration ■ Anxiety withdrawal e.g. generally fearful, anxious ■ Motor tension/excess e.g. hyperactive, always on the go
		Relationship Quality	MOR; as at 4-8 months
		Social Skills	As at 11-12 years
		Peer relationships	■ Quality of relationships e.g. others seek your child out ■ Organised group participation e.g. participates in school sports teams
		Antisocial peer affiliations	As at 11-12 years
		Academic & Social Progress at School	As at 12-13 years
		Parenting Practices and Style	■ Inductive Reasoning e.g. explain reasons for requests ■ Warmth e.g. how well get on with child ■ Monitoring e.g. how often parent finds out where their child is going ■ Physical punishment e.g. hit, slap or spank ■ Harsh discipline e.g. yell, scold, or swear at child ■ Authoritarian style/obedience orientation e.g. expect obedience even if child disagrees
		Parental smoking and drinking habits	Non, ex, occasional, moderate, heavy smoker / drinker
		Family SES	As at 1-2 years

continued ➤

Table 4 continued

Age	Source of report	Domain	Construct/variable
13-14 Years 1996 cont.		Family Stress	As at 9-10 years
		Parental unemployment	During the past year
	Teenager	Behaviour Problems	■ Oppositional e.g. I lose my temper easily ■ Hyperactivity e.g. I find it hard to keep concentrating on tasks ■ Anxiety e.g. I get anxious and scared ■ Depression e.g. I feel I am no good anymore ■ Antisocial e.g. steal, carry a weapon, in physical fights
		Substance Use	■ Smoking ■ Drinking ■ Sniffing ■ Marijuana ■ Other drugs e.g. speed, heroin
		Social Skills	As at 11-2 years
		Emotional control	e.g. know how to relax when feeling tense
		Curiosity scale	■ Breadth of interests e.g. liking for doing frightening things ■ Depth of interests e.g. liking for searching for answers
		Academic & Social Progress at School	As at 12-13 years
		Peer relationships	■ Peer attachment e.g. tell friends about my problems ■ Friendship quality e.g. we have good times together
		Antisocial peer affiliations	Friends' antisocial activities (e.g. get into fights, break the law) & substance use (e.g. alcohol, marijuana)
		Family relationships	Parent attachment e.g. parents respect my feelings
15-16 Years 1998	**Parent**	Temperament	As at 11-12 years
		Personality	■ Extraversion e.g. energetic, talkative ■ Agreeableness e.g. cooperative, polite ■ Conscientiousness e.g. organised, responsible ■ Neuroticism e.g. nervous, tense ■ Openness to experience/Intellect e.g. artistic, imaginative
		Behaviour Problems	As at 13-14 years
		Relationship Quality	MOR; as at 4-8 months
		Social Skills	Assertiveness and Self control, as at 11-12 years
		Academic & Social Progress at School	As at 12-13 years
		Peer relationships	As at 13-14 years ■ Quality of relationships ■ Organised peer group participation
		Antisocial peer affiliations	As at 11-12 years
		Parenting practices and style	As at 13-14 years, but without Physical punishment scale
		Family SES	As at 1-2 years
		Family Stress	As at 7-8 years
		Parental unemployment	During the past year
	Teenager	Behaviour problems	As at 13-14 years
		Substance Use	As at 13-14 years
		Personality	As for parent report 15-16 years
		Sensation seeking	Thrill and adventure seeking e.g. attraction to activities such as parachute jumping, mountain climbing
		Emotional control	As at 13-14 years
		Social skills	Assertiveness
		Bonding to School	■ Positive affect e.g. I like learning ■ Relationship with teachers e.g. teachers take a personal interest ■ Opportunity e.g. the things I learn will help later ■ Status e.g. people look up to me ■ Achievement e.g. I am a success as a student
		Peer relationships	Friendship quality with best friends e.g. makes me feel good about myself

continued ➤

Table 4 continued

Age	Source of report	Domain	Construct/variable
15-16 Years 1998 cont.		Antisocial peer affiliations	As at 13-14 years
		Social responsibility, civic mindedness	■ Community participation e.g. take part in fund-raising activities ■ Political awareness e.g. have strong feelings about politics ■ Civic responsibility /efficacy e.g. everyone has the responsibility to work to make the world a better place
		Eating behaviours and attitudes	As at 13-14 years
17-18 Years 2000	**Parent**	Temperament	As at 11-12 years ■ Reactivity ■ Persistence ■ Approach
		Personality	As at 15-16 years
		Behaviour Problems	As at 13-14 years
		Relationship Quality	MOR; as at 4-8 months
		Academic & Social Progress at School	As at 13-14 years
		Antisocial peer affiliations	As at 11-12 years
		Parents' substance use	As at 13-14 years
		Parental separation/ divorce/ death during child's life	Yes/ no
		Family SES status	Parents' occupation and educational levels
		Marital relationship during child's lifetime	■ Relationship satisfaction e.g. get on well, feel partner meets needs ■ Conflict e.g. argue about finances, physical hostility
		Family Cohesion	e.g. know each others' close friends
		Parent- adolescent conflict	e.g. have serious arguments, child thinks my opinions don't count
		Parenting practices / style	As at 15-16 years; also ■ Inconsistent Discipline e.g. I give up when s/he doesn't do what I ask ■ Enmeshment e.g. I can't be happy when my teen isn't happy or healthy
		Family SES	As at 1-2 years
		Family Stress	As at 7-8 years
	Teenager	Behaviour Problems	As at 15-16 years
		Substance Use	As at 15-16 years
		Personality	As at 15-16 years
		Emotional control	As at 15-16 years
		School Bonding	e.g. I work hard to be successful; it's important to me to do well at school
		Peer relationships	■ Communication e.g. I tell them my problems/troubles ■ Trust e.g. they accept me as I am ■ Alienation e.g. they get irritated with me for no reason
		Relationships with parents	■ Communication e.g. tell parents about problems ■ Trust e.g. trusts my judgment ■ Alienation e.g. doesn't understand me ■ Monitoring e.g. wants to know what time I'll be home
		Teen coping styles	■ Diversion seeking e.g. read books/magazines, go shopping ■ Cope via drug use e.g. smoke, drink alcohol ■ Self blame e.g. criticise/lecture myself ■ Ventilate feelings e.g. complain to others ■ Support seeking e.g. be close with someone ■ Wishful thinkg e.g. hope a miracle will happen ■ Use humour e.g. joke, keep a sense of humour ■ Independence e.g. try to work it out on my own
		Self Concept	e.g. have a good opinion of myself, am as nice looking as most
		Identity formation	■ Identity clarity e.g. have a clear idea of what I want to be ■ Optimism e.g. I really believe in myself ■ Privacy e.g. I prefer not to show too much of myself ■ Intimacy e.g. I'm ready to get involved with a special person

3 *Frequency of antisocial behaviour*

Adolescent participants were asked about their engagement in antisocial behaviours at three timepoints: 13-14 years (1996), 15-16 years (1998), and 17-18 years (2000). A summary of the questions used to assess antisocial behaviour is presented in Table 5. All questions relate to participant's behaviour within the past twelve months, with the exception of those concerning substance use, which refer to the past month.

As antisocial behaviour may be expressed in different ways at different ages (Moffitt et al. 2001), items were added to the scale at each timepoint, to accommodate age-related changes in the manner in which antisocial behaviour may be exhibited.

Table 5 Australian Temperament Project assessment of antisocial behaviour

At 13-14 (1996), 15-16 (1998) and 17-18 (2000) years

- Got into physical fights with other people
- Damaged something in a public place ("on purpose" added from 15-16 years)
- Stolen something ("from a person or a house" added at 17-18 years)
- Driven a car without permission
- Been suspended or expelled from school
- Done graffiti in public places
- Carried a weapon ("e.g. gun, knife" added at 15-16 years)
- "Wagged" (skipped) school
- Frequency of cigarette use*
- Frequency of alcohol use*
- Frequency of marijuana use*
- Frequency of sniffing*
- Frequency of other drug use*

Additional questions at 15-16 (1998) and 17-18 (2000) years

- Shoplifted
- Run away from home and stayed away overnight or longer
- Been in contact with, or cautioned by, police for offending
- Been charged by police
- Appeared in court as an offender
- Frequency of binge drinking*
- Frequency of drunkenness*
- Deleterious consequences of drinking alcohol*

Additional questions at 17-18 (2000) years

- Sold illegal drugs
- Attacked someone with the idea of seriously harming them
- Been convicted in court of a criminal offence
- Deleterious consequences of marijuana and other drug use, including trouble with police*
- Substance dependence (alcohol, marijuana and other drugs).*

* These items relate to the past month.

Frequency of antisocial acts across the adolescent years

The frequency with which ATP participants reported engaging in each antisocial act is presented in Table 6. Data are presented for each of the three data waves in which this information was collected (that is, 13-14, 15-16, and 17-18 years). For clearer presentation of findings, antisocial acts have been grouped into five categories: (1) those involving property offences, (2) authority conflict problems, (3) violent and drug-related antisocial acts, (4) criminal justice contacts (as a consequence of antisocial acts), and (5) substance use. The trends emerging from this table will be discussed in detail later in this section.

Figures 1-5 pictorally display the proportion of individuals in the sample who reported engaging in the antisocial act on at least one occasion during the last 12 months.

Table 6 Frequency of antisocial acts in the ATP sample over the adolescent years

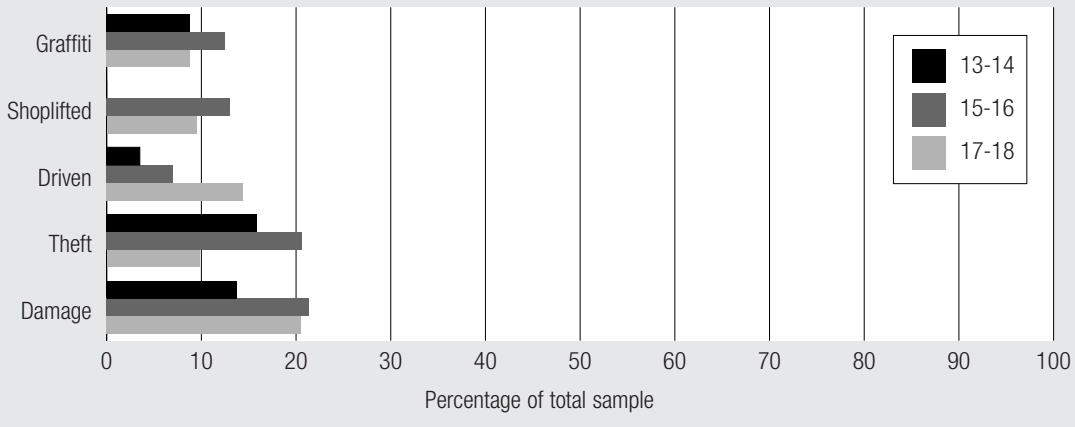
Antisocial act	Percentage who reported 'Not at all'			Percentage who reported 'Once'			Percentage who reported 'Twice or more'		
	13-14 years	15-16 years	17-18 years	13-14 years	15-16 years	17-18 years	13-14 years	15-16 years	17-18 years
Property									
Damaged	86.3	78.6	79.5	10.7	13.5	11.4	3.0	7.9	9.1
Driven	96.5	93.0	85.6	2.4	3.8	7.7	1.1	3.2	6.7
Graffiti	91.2	87.5	91.2	6.3	6.5	4.8	2.5	5.9	4.1
Shoplifted	—	87.0	90.5	—	6.5	4.1	—	2.7	5.3
Theft	84.1	79.4	90.2	11.0	11.3	6.5	4.9	9.3	3.3
Authority									
Run Away	—	96.0	94.5	—	2.5	3.3	—	1.5	2.2
Skipped School	89.5	73.5	57.2	7.2	10.6	11.2	3.3	9.2	31.6
Suspend/Expel	95.4	93.0	95.1	3.3	5.2	3.6	1.3	1.7	1.3
Violent/Drug									
Attacked	—	—	94.7	—	—	3.4	—	—	1.8
Fights	66.2	67.4	76.9	20.7	19.2	14.8	13.1	13.4	8.3
Sold Drugs	—	—	94.4	—	—	1.7	—	—	3.9
Weapon	93.4	91.5	94.0	4.1	4.3	2.4	2.5	4.2	3.6
Criminal Justice									
Charged	—	98.1	96.6	—	1.4	2.5	—	0.5	0.9
Contact	—	86.6	87.7	—	10.6	8.1	—	2.8	4.1
Court	—	99.4	98.7	—	0.4	1.0	—	0.2	0.3
Convicted	—	—	99.4	—	—	0.5	—	—	0.2
Substance Use									
Alcohol*	62.0	16.5	6.7	15.6	25.3	13.2	22.5	58.2	80.1
Cigarettes*	78.4	32.5	30.8	5.3	12.8	8.9	16.2	54.7	60.2
Marijuana*	93.6	46.2	52.8	4.9	20.8	18.7	1.4	32.9	28.5
Other Drugs*	—	96.2	96.6	—	2.4	1.7	—	1.5	1.8

Note: * These variables relate to frequency during the past month (not year).
— Not assessed at this timepoint
Damaged = Damaged something in a public place on purpose; Driven = Driven a car without permission; Graffiti = Done graffiti in public places; Shoplifted = Shoplifted; Theft = Stolen something (from a person or a house); Run Away = Run away from home and stayed away overnight or longer; Skipped School = Skipped School; Suspend/Expel = Been suspended or expelled from school; Attacked = Attacked someone with the idea of seriously harming them; Fights = Got into physical fights with other people; Sold Drugs = Sold illegal drugs; Weapon = Carried a weapon (e.g. gun, knife); Charged = Been charged by police; Contact = Been in contact with, or cautioned by, police for offending; Court = Appeared in court as an offender; Convicted = Been convicted in court of a criminal offence; Alcohol = drank alcohol in last month; Cigarettes = Smoked cigarettes in last month; Marijuana = Used marijuana in last month; Other Drugs = Used other illegal drugs in last month.

Property offences

As shown in Figure 1, involvement in property offences, in particular, damaging public property and theft, was relatively common among ATP participants. Engagement in most property crimes appears to peak around 15-16 years of age in the ATP sample. The exceptions to this were driving a car without permission, which increased as participants approached the Victorian legal driving age (18 years), and property damage, which remained relatively stable between 15-16 and 17-18 years of age.

Figure 1 Property offences by age

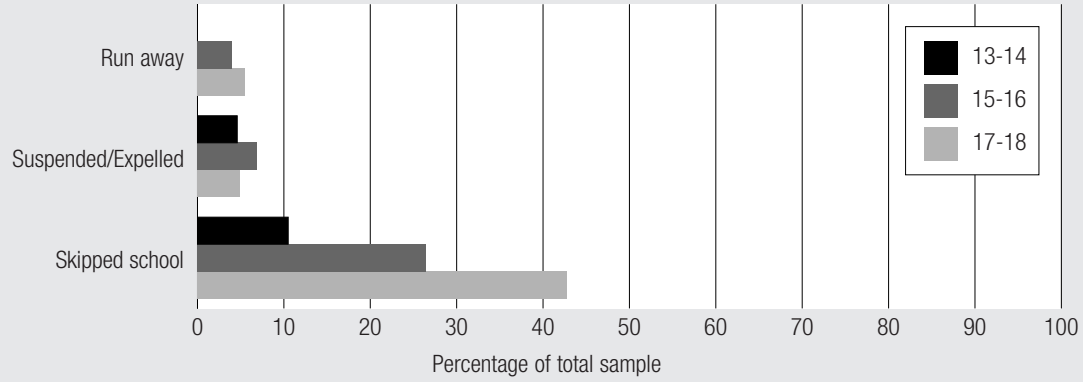


Note: Graffiti = Graffiti drawing in public places; Shoplifted = Shoplifted; Driven = Driven a car without permission; Theft = Stolen something (from a person or a house); Damage = Damaged something in a public place on purpose.

Authority conflict problems

Skipping school was a common occurrence among ATP participants with over 40 per cent of 17-18 year olds admitting that they had skipped school at least once during the past year (See Figure 2). The other authority conflict problems were much less frequent, with fewer than seven percent of participants in each data collection wave reporting that they had run away from home, and/or been suspended or expelled from school.

Figure 2 **Authority conflict problems by age**



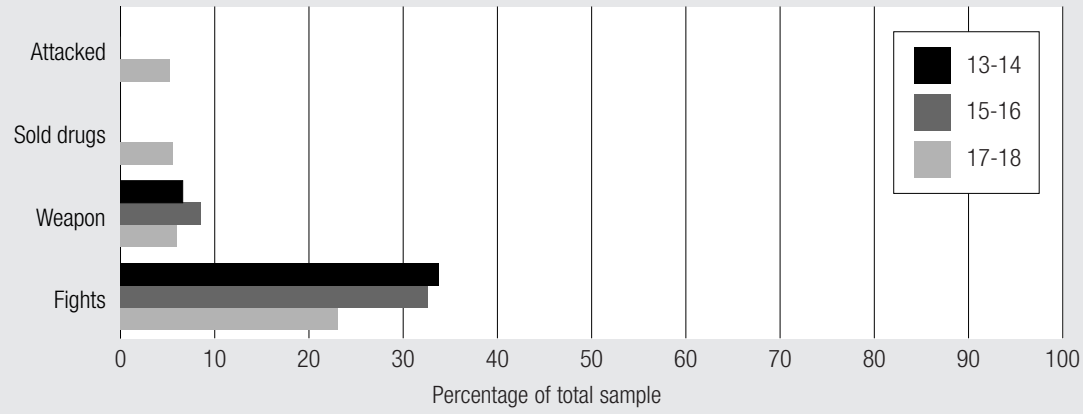
Note: Run Away = Run away from home and stayed away overnight or longer; Suspended/Expelled = Been suspended or expelled from school; Skipped School = Skipped School.

Violent and drug-related antisocial acts

As Figure 3 shows, involvement in physical fights was commonly reported. Approximately a third of the sample in 1996 (13-14 years) and 1998 (15-16 years) reported that they had been in a physical fight with another person in the past year. However, by 2000 (17-18) the proportion of individuals engaging in physical fights had decreased quite markedly.

At 17-18 years of age, the proportion of individuals who reported having attacked someone with the intention of seriously harming them, having sold illegal drugs and having carried a weapon was very similar and quite low (between five and six percent). (Participants were not asked whether they had attacked someone or sold illegal drugs at ages 13-14 or 15-16). The proportion carrying a weapon was slightly higher at 15-16 years of age than at the other two ages.

Figure 3 **Violent and drug-related antisocial acts by age**



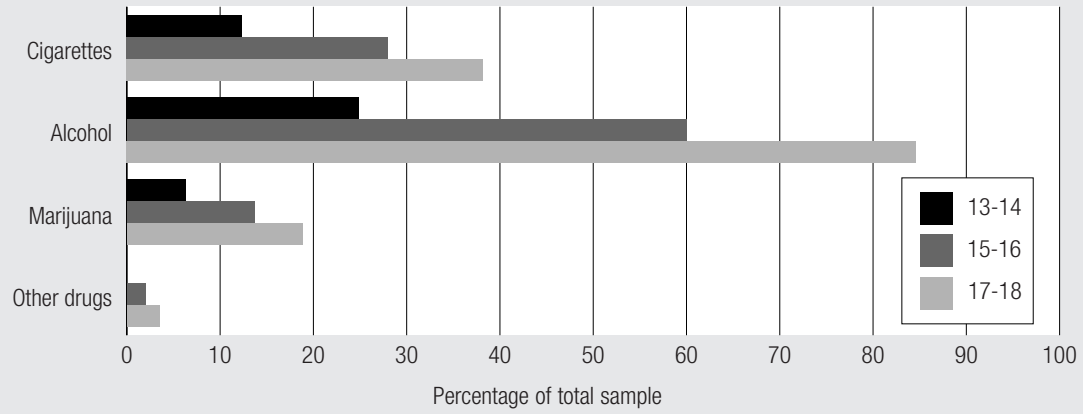
Note: Attacked = Attacked someone with the idea of seriously harming them; Sold Drugs = Sold illegal drugs; Weapon = Carried a weapon (e.g. gun, knife); Fights = Got into physical fights with other people.

Substance use

As mentioned earlier, all questions relating to substance use refer to participant's use within the past month.

As Figure 4 shows, the frequency with which participants engaged in all types of substance use increased with age. Consumption of alcohol was extremely common within the ATP sample, with almost 85 per cent of participants at 17-18 years of age reporting that they had consumed alcohol on at least one occasion during the past month. Cigarette smoking was also very common among this sample. Marijuana use was less frequent, peaking at just under 20 per cent by 17-18 years of age. The use of "hard" drugs such as amphetamines, designer drugs and opiates was very low.

Figure 4 **Substance use by age**

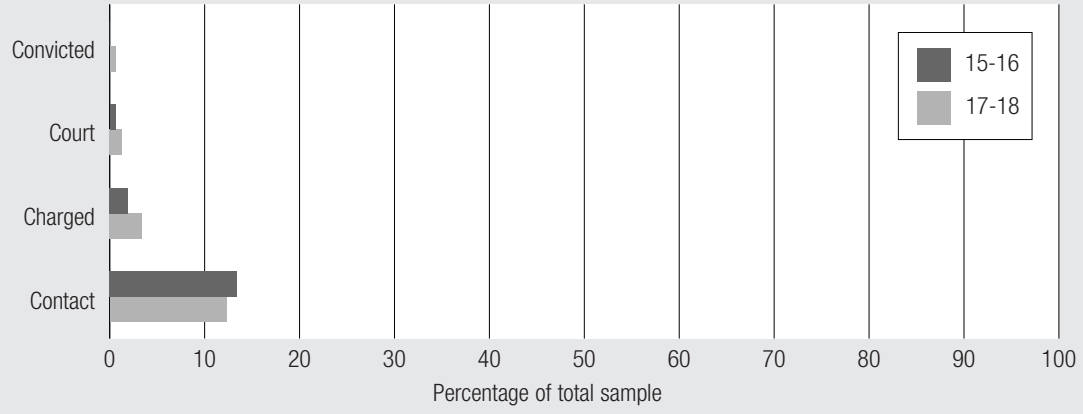


Note: Cigarettes = Smoked cigarettes in last month; Alcohol = drank alcohol in last month; Marijuana = Used marijuana in last month; Other drugs = Used other illegal drugs in last month.

Criminal justice contacts

While a considerable proportion of participants aged 15-16 and 17-18 years reported having been in contact with the police for offending; the proportion of participants who had been charged with an offence, appeared in court as an offender, or convicted of an offence, was very small. However, Figure 5 suggests a slight increase in contact with the criminal justice system with age.

Figure 5 **Criminal justice contacts by age**



Note: Convicted = Been convicted in court of a criminal offence; Court = Appeared in court as an offender; Charged = Been charged by police; Contact = Been in contact with, or cautioned by, police for offending.

In summary, antisocial behaviour was quite common among the ATP adolescents. Property offences were one of the most common types of antisocial behaviour, with approximately 10-20 per cent of participants engaging in activities such as stealing and vandalism. Authority conflict and violent acts were much less common (generally less than 10 per cent) with the exceptions of skipping school (a high of 43 per cent at 17-18 years) and involvement in physical fights (a high of 34 per cent at 13-14 years). While cigarette and alcohol use were common (39 per cent and 85 per cent respectively, at 17-18 years), fewer participants had used marijuana (increasing from 6 to 19 per cent over the teenage years) and very few had used "hard drugs" (less than 4 per cent). About one in ten participants had been in contact with police for offending, but only a very small number had been charged (2-3 per cent), appeared in court (about 1 per cent), or been convicted of a crime (less than 1 per cent).

Frequency of antisocial acts among male and female adolescents

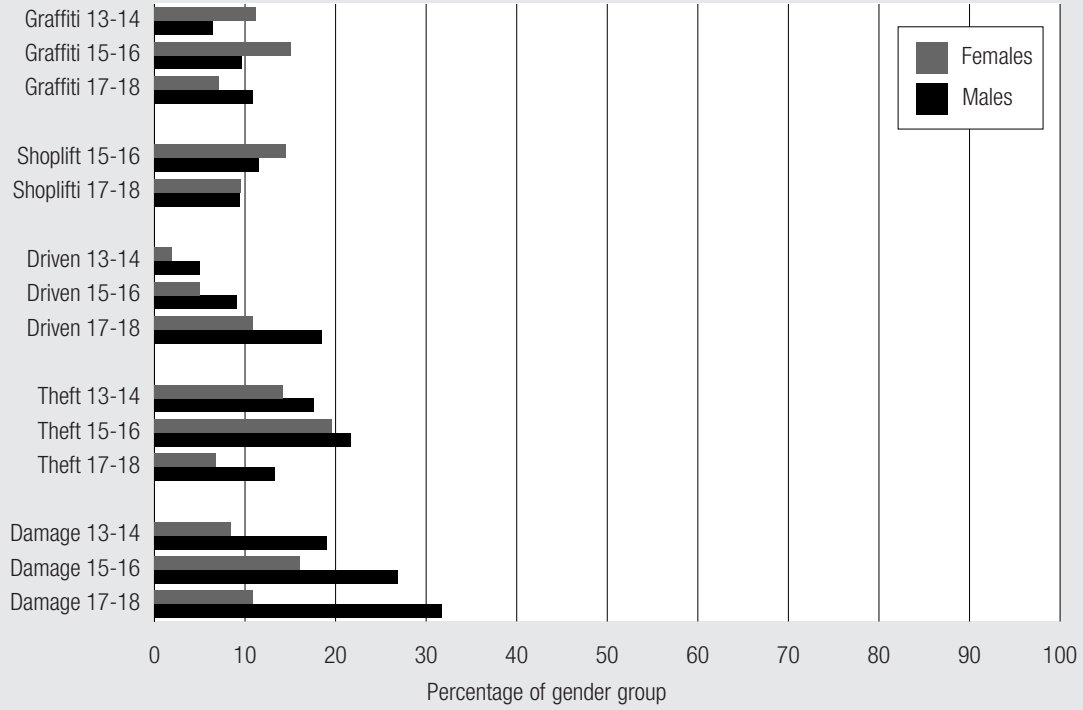
The proportion of males and females who reported engaging in each type of antisocial act are presented in Figures 6 to 10, while a detailed description of significant group differences is contained in Appendix 1[2]. It should be noted that these graphs depict *the relative proportion of males and females who reported engaging in each antisocial act* at the separate timepoints.

2 Copies of the appendices are available in an electronic format from Crime Prevention Victoria's website, www.crimeprevention.vic.gov.au.

Property offences

As shown in Figure 6, damaging public property (at all timepoints) and driving a car without permission (at 13-14 and 17-18 years) was noticeably more common among male ATP participants than female participants. On the other hand, a higher proportion of females than males reported engaging in graffiti in public places at 13-14 years of age. Rates of shoplifting and theft were fairly similar across males and females, except at 17-18 years, when a higher proportion of males admitted to having stolen something from a person or a house in the past year.

Figure 6 **Property offences by gender**

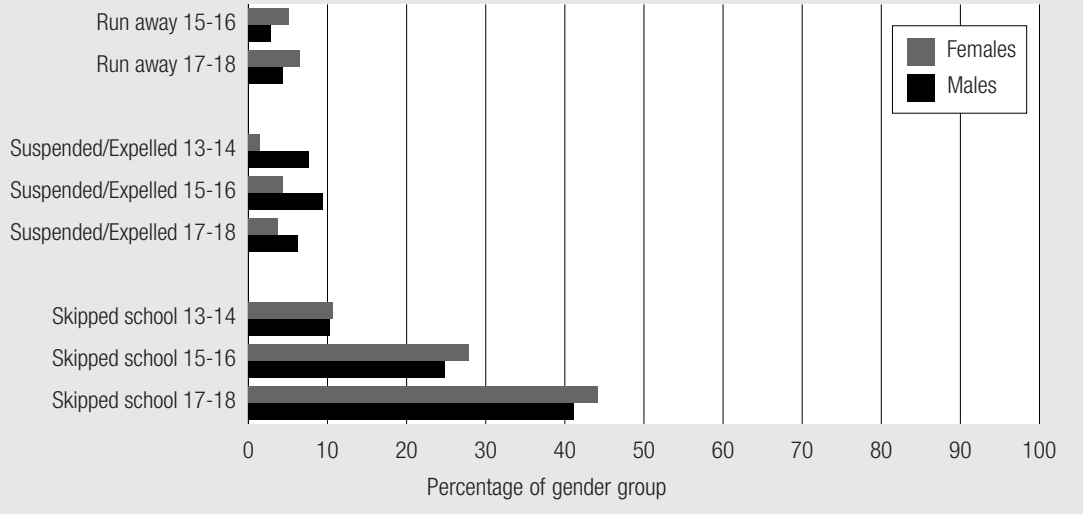


Note: Graffiti = Done graffiti in public places; Shoplift = Shoplifted; Driven = Driven a car without permission; Theft = Stolen something from a person or house; Damage = Damaged something in a public place (on purpose).

Authority conflict problems

Similar proportions of males and females reported skipping school and running away from home at each timepoint (see Figure 7). However, males were more likely to report having been suspended or expelled from school at 13-14 and 15-16 years.

Figure 7 **Authority conflict problems by gender**

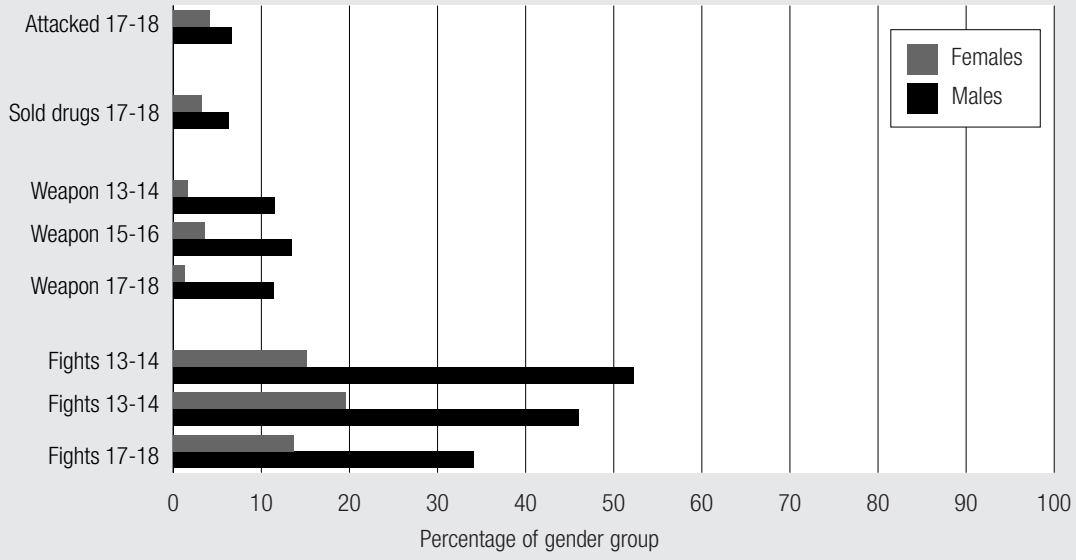


Note: Run Away = Run away from home and stayed away overnight or longer; Suspended/Expelled = Suspended/expelled from school; Skipped School = skipped school.

Violent and drug-related antisocial acts

As Figure 8 shows, without exception, a higher proportion of males than females reported having sold illegal drugs, carried a weapon and been involved in a physical fight with others, at each timepoint. The proportion of males and females who admitted to having attacked someone with the intention of seriously harming them was fairly similar.

Figure 8 **Violent and drug-related antisocial acts by gender**

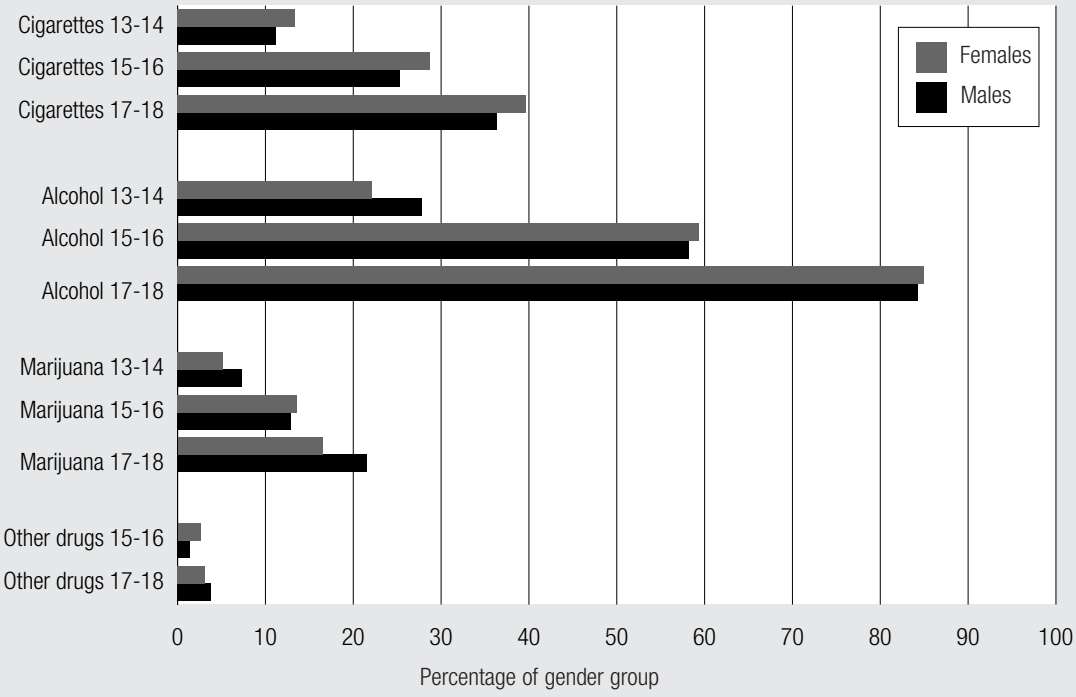


Note: Attacked = Attacked someone with the idea of seriously harming them; Sold Drugs = Sold illegal drugs; Weapon = Carried a weapon (e.g. gun, knife); Fights = Got into physical fights with other people

Substance use

Figure 9 shows that a similar proportion of males and females reported having smoked cigarettes, consumed alcohol, used marijuana and/or used hard drugs at all timepoints.

Figure 9 **Substance use by gender**

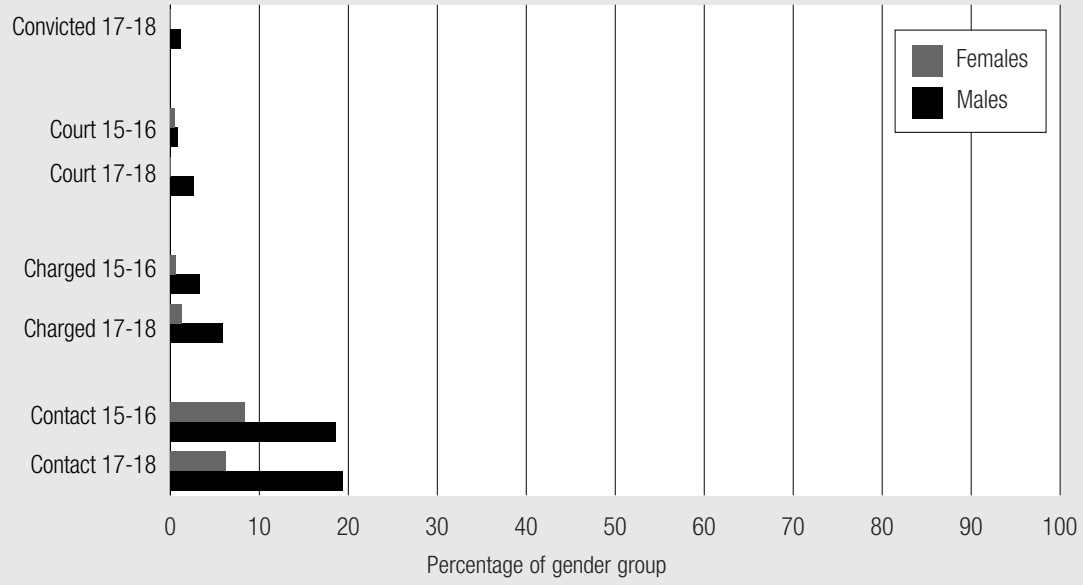


Note: Cigarettes = Smoked cigarettes; Alcohol = Drunk alcohol; Marijuana = Used marijuana; Other Drugs = Used other illegal drugs.

Criminal justice contacts

With the exception of 15-16 years, when a small but similar proportion of males and females reported having appeared in court as an offender, much higher proportions of males than females reported having been in contact with the criminal justice system at all timepoints (see Figure 10). This gender difference was most notable when comparing the proportion of males and females who had been in contact with, or cautioned by, police for offending (approximately 19 per cent males compared with 6-8 per cent females).

Figure 10 **Criminal justice contacts by gender**



Note: Convicted = Been convicted in court of a criminal offence; Court = Appeared in court as an offender; Charged = Been charged by police; Contact = Been in contact with, or cautioned by, police for offending.

In summary, cigarette and alcohol use were the most common antisocial behaviours across both sexes, with cigarette use escalating from approximately one-in-ten adolescents at 13-14 years to four-in-ten adolescents at 17-18 years, and alcohol use from one-fifth to four-fifths of adolescents over the same time period. Skipping school was also quite common, increasing from one-in-ten at 13-14 years to four-in-ten at 17-18 years for both males and females.

For males, involvement in physical fights was relatively common (an incidence of 34-54 per cent) – although diminishing with age – while property damage escalated from one-fifth in early adolescence to one-third in late adolescence. One-in-five males had been in contact with police for offending, while 10-20 per cent had committed theft, driven a car without permission, or used marijuana. Around 10 per cent males had shoplifted, engaged in graffiti, or carried a weapon. Between 5-10 per cent had been suspended or expelled from school, while approximately 5 per cent had attacked someone with the idea of seriously harming them, sold drugs, run away from home, or been charged by police.

For females, engaging in physical fights and property offences were the most common types of antisocial behaviour, with rates of approximately 10-15 per cent for all types of offences. Marijuana use was the next most frequent behaviour, ranging from 5-16 per cent from early to late adolescence. Just over 5 per cent females had been in contact with police for offending and a similar proportion had run away from home. All other types of antisocial behaviour were extremely rare, at lower than 5 per cent occurrence.

4 *Formation of persistent, experimental and low/non antisocial groups*

To assist with the identification of risk factors for the development of antisocial and criminal behaviour, participants were grouped on the basis of their pattern of antisocial behaviour over three data collection points (13-14 years, 15-16 years, and 17-18 years).

First, individuals were classified as displaying high or low levels of antisocial at each timepoint. An individual was classified as displaying *high levels of antisocial behaviour* at a particular timepoint if he or she reported engaging in three or more different antisocial acts during the previous 12 months[3], while those who reported fewer than three different antisocial acts within the previous 12 months were classified as displaying *low levels of antisocial behaviour* at that timepoint.

Some acts (i.e. alcohol use, cigarette use, and skipping school), while socially undesirable and/or officially illegal at these ages, were so common within the sample as to appear almost normative. These behaviours were therefore not included in the definition of antisocial behaviour. Contact with the criminal justice system was also excluded from our definition as contact with this system is not an antisocial act in itself, but usually results from an antisocial act being detected.

Consequently, to be classified as being high in antisocial behaviour, an individual must have engaged in three or more of the following behaviours on at least one occasion during the past 12 months:

- been in physical fights with others;
- damaged something in a public place on purpose;
- stolen something (from a person or a house);
- driven a car without permission;
- been suspended or expelled from school;
- engaged in graffiti in public places;
- carried a weapon (for example, gun, knife);
- shoplifted;
- run away from home or stayed away overnight or longer;
- sold illegal drugs;
- attacked someone with the idea of seriously harming them;
- used marijuana (*within the past month*);
- used hard drugs, such as amphetamines, cocaine, designer drugs or opiates (*within the past month*)

Using this criterion, 12.4 per cent of participants in at 13-14 years (1996), 19.7 per cent of participants at 15-16 years (1998) and 20.0 per cent of participants at 17-18 years (2000), exhibited high levels of antisocial behaviour.

Patterns of antisocial behaviour over time

We next examined the data for the three timepoints to identify patterns of behaviour across time. For some participants, data were available for only two timepoints. These data were included if the level of antisocial behaviour was consistent across both survey waves (for example, both high, both low). Individuals who were high at one timepoint and low at the other were not included, as the absence of information from the third timepoint made it difficult to determine whether behaviour patterns were transient or stable. A further condition for inclusion was that data must be present at 17-18 years, so that participants' current levels of antisocial behaviour could be ascertained. Eight patterns of antisocial behaviour were identified (see Table 7).

3 The cut-off of three or more different antisocial acts in the past year is consistent with the diagnostic criteria for Conduct Disorder in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994).

Using the Experimental-Persistent typology (Kelley et al. 1997; Moffitt et al. 2001; Moffitt and Harrington 1996) as a guide, the eight groups were combined into three larger groups based upon the stability of their antisocial behaviour:

- *"Low/non antisocial"* – these participants displayed low or no antisocial behaviour at all timepoints that data were available for them (Group 1 in Table 7).
- *"Experimental"* – these participants exhibited high antisocial behaviour at one timepoint only and appeared to have desisted (Groups 2 and 3 in Table 7).
- *"Persistent"* – these individuals reported high antisocial behaviour at two or more timepoints, including the latest timepoint (Groups 6, 7 and 8 in Table 7).

Individuals who displayed high antisocial behaviour at only 17-18 (Group 4 in Table 7) were not included in the *experimental* group as, in the absence of follow-up data, it could not be determined whether their behaviour was of a transitory nature. In addition, participants who exhibited high antisocial behaviour at ages to 13-14 and 15-16 years but not 17-18 (Group 5), were excluded from the *persistent* group because although they exhibited persistent antisocial behaviour over two waves of data collection, they had desisted by 17-18 years. Hence, they did not fit with the other groups (6, 7, and 8) who were still actively antisocial at the last data collection wave. The three groups formed on the basis of the criteria above are summarised in the right-hand column of Table 7.

Table 7 Patterns of antisocial behaviour over time

Pattern			Group	
1. Low (or none) at all times	(n=844)	→	LOW/NON ANTISOCIAL	(n=844)
2. High at 13-14 only	(n=23)	→	EXPERIMENTAL	(n=88)
3. High at 15-16 only	(n=65)	→		
4. High at 17-18 only	(n=80)	×		
5. High at 13-14 and 15-16	(n=23)	×		
6. High at 15-16 and 17-18	(n=61)	→	PERSISTENT	(n=131)
7. High at 13-14 and 17-18	(n=22)	→		
8. High at all times	(n=48)	→		

Note: Low = Low antisocial behaviour; High = High antisocial behaviour

Group characteristics

Gender

The gender composition of the three groups is shown in Table 8. It can be seen that there were more males than females in the *persistent* group, and somewhat fewer males than females in the other two groups.[4] The male:female ratio in the *persistent* group is consistent with the New Zealand trends reported by Moffitt et al. (2001), although it is less pronounced.

While not significant, the slightly higher proportion of females in the *experimental* group is at odds with Moffitt's findings of slightly more males than females in the adolescent-limited group. These differences could be a result of somewhat different group selection methods; sampling differences (the ATP study includes urban and rural participants while the New Zealand study is of urban participants; and the ATP has a larger sample); time of survey effects (the New Zealand data on antisocial behaviour was collected in the mid to late 1980s while the comparative ATP data was collected in the mid to late 1990s); cultural differences; or differential attrition effects (the New Zealand study has had lower rates of attrition than the ATP study).

Table 8 also shows that ATP males, if antisocial, were much more likely to be persistently antisocial, while females were equally likely to be *persistent* or *experimental.*

Table 8 Gender composition of groups

Group	Male			Females		
	n	% of males	% of group	n	% of females	% of group
Low/Non Antisocial	345	73.7	40.9	499	83.9	59.1
Experimental	38	8.1	43.2	50	8.4	56.8
Persistent	85	18.2	64.9	46	7.7	35.1

4 A chi-square test of independence revealed that the differences in the relative proportion of males to females in the three groups was statistically significant, $\chi^2(2) = 25.79$, $p<.001$. An examination of the standardised residuals revealed a significantly higher number of males in the 'persistent' group, and a lower number of females in this group, than would be expected by chance. The relative proportion of males to females in the experimental group was not significantly different to that expected by chance.

Profile of antisocial behaviours in the three groups

The three groups were compared on the criteria used to define antisocial behaviour, as shown in Table 9. It can be seen that a higher proportion of the *persistent* group engaged in all types of antisocial behaviour at all timepoints than adolescents in the *low/non antisocial* group.

Furthermore, significantly more *experimental* than *low/non antisocial* individuals reported using marijuana (at 13-14), running away from home (at 15-16) and engaging in property offences (for example, property damage, theft, graffiti at 13-14 and 15-16; driving a car without permission, shoplifting at 15-16 years). There were no significant differences between the *experimental* and *low/non antisocial* groups at ages 17-18, which is a result of the method used to select groups[5]. A more detailed description of group differences is contained in Appendix 2.

Table 9 Type of antisocial behaviour by group

Type of Behaviour	Low/No-Antisocial (%)			Experimental (%)			Persistent (%)		
	13-14	*15-16*	*17-18*	*13-14*	*15-16*	*17-18*	*13-14*	*15-16*	*17-18*
Fights	20.3	17.6	11.7	46.0	58.0	18.2	71.5	71.3	71.0
Damage	3.0	6.4	8.1	25.3	46.0	17.0	53.7	76.2	71.8
Theft	5.3	5.8	2.7	32.2	54.5	8.0	47.5	73.8	43.8
Driven	0.6	2.1	5.6	3.5	13.6	12.5	10.6	24.6	50.4
Suspend/expel	1.3	2.3	0.9	4.6	8.0	0.0	13.0	26.4	22.3
Graffiti	2.8	3.6	2.3	17.2	36.4	5.7	37.4	44.3	35.9
Weapon	1.0	2.3	2.0	5.7	13.6	1.1	26.8	33.3	27.7
Shoplift	--	2.9	3.0	--	35.2	4.5	--	51.2	42.7
Run away	--	0.9	1.9	--	10.2	4.5	--	16.4	22.1
Sold drugs	--	--	0.4	--	--	2.3	--	--	31.3
Attacked	--	--	0.6	--	--	2.3	--	--	26.0
Marijuana*	0.8	3.6	7.3	14.8	33.0	26.1	23.7	48.9	61.1
Other Drugs*	--	0.4	0.1	--	1.1	3.4	--	10.7	17.6

Note: * These variables relate to frequency during the past month (not year).
__ Not assessed at this timepoint
Fights = Got into physical fights with other people; Damage = Damaged something in a public place on purpose; Theft = Stolen something (from a person or a house); Driven = Driven a car without permission; Suspend/expel = Been suspended or expelled from school; Graffiti = Done graffiti in public places; Weapon = Carried a weapon (e.g. gun, knife); Shoplift = Shoplifted; Run away = Run away from home and stayed away overnight or longer; Sold drugs = Sold illegal drugs; Attacked = Attacked someone with the idea of seriously harming them; Marijuana = Used marijuana in last month; Other drugs = Used other illegal drugs in last month.

5 One requirement of 'experimental' group membership was that individuals did not display high levels of antisocial behaviour at 17-18 years (i.e. they had engaged in fewer than three antisocial acts in the preceding 12 months).

5 *Precursors of adolescent antisocial behaviour*

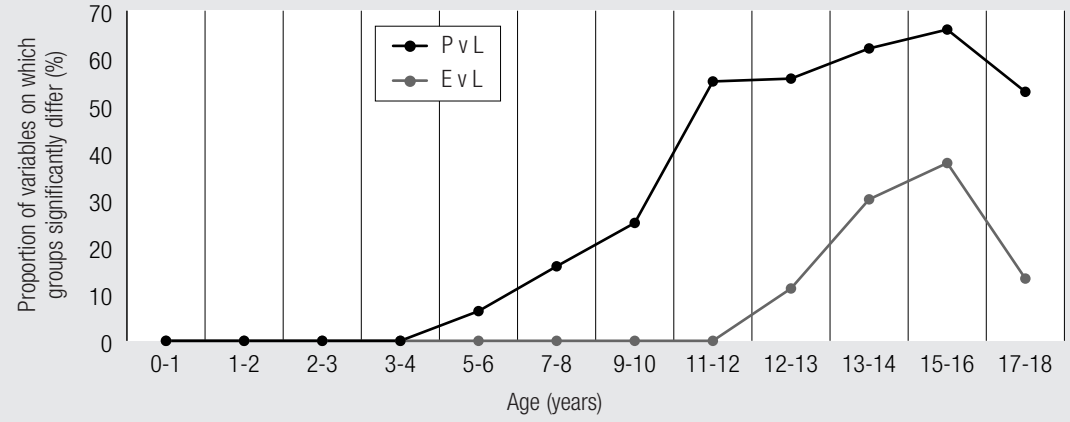
Having examined the nature and extent of antisocial behaviour in the ATP sample, we next investigated precursors of antisocial behaviour. In order to do this, separate Multivariate Analyses of Variance (MANOVA) were performed for each data collection wave and source of report (parent, teacher, or child/teen)[6]. The strategy of examining each wave of data separately enables the identification of the age and stage of development at which significant group differences begin to emerge. Furthermore, it maximises the number of participants included in the analyses, which is of importance to maintain power[7]. Effect sizes[8] were used to assess the strength of group differences across the various domains.

In the following section we present analyses investigating precursors of adolescent antisocial behaviour at different ages/stages of development; across different domains of functioning; and finally, among males and females.

Predictors of antisocial behaviours across age / stage of development

Figure 11 broadly illustrates the timing and number of differences between the low/no and two antisocial groups. To facilitate identification of the onset of pathways to *persistent* and *experimental* antisocial behaviour, only differences between the *persistent* and *low/non antisocial* groups, and the *experimental* and *low/non antisocial* groups are presented here. This comparison enables the identification of the age/stage of development at which each group begins to diverge from the 'normal' developmental pathway exhibited by the *low/non antisocial* group. These differences will be discussed in more detail in the following sections, as will differences between the *experimental* and *persistent* groups.

Figure 11 **Group differences over time**



Note: P = Persistent group, L= Low/non antisocial group, E = Experimental group

As Figure 11 shows, no significant differences were found between the two antisocial groups and *low/non antisocial* group in the earliest years of life (infancy to 3-4 years). The first group differences emerged between the *persistent* and *low/non antisocial* groups at 5-6 years. Over the primary school years, the number of variables on which the *persistent* group was significantly more problematic that the *low/non antisocial* group rose steadily from less than 10% at 5-6 years, around 25% at 9-10 years, to over 50% at 11-12 years. The *experimental* and *low/non antisocial* groups did not differ significantly until early adolescence. The peak age at which differences were most evident was 15-16 years, with the *persistent* group differing from the *low/non antisocial* group on two-thirds of variables, and the *experimental* group differing from the *low/non antisocial* group on approximately 40% variables. Towards the end of adolescence, differences between both antisocial groups and the *low/non antisocial* group decreased, however, this decrease was most marked for the *experimental* group.

6 Due to the number of analyses performed, the Bonferroni adjustment procedure was used to adjust the significance level to reduce Type 1 error, or the likelihood of showing group differences of statistical significance when they are not actually there. Results are reported for differences at the Bonferroni adjusted significance level of 0.0025 or lower. However, when results were significant at a less stringent level of $p<0.05$, this is noted as a trend. Scheffe post-hoc contrasts were used to identify significant group differences.

7 Many participants have missing data at one or more survey waves, hence across-time MANOVAs, which require no missing data, could result in unacceptably small groups sizes.

8 Cohen's (1998) effect size criteria were used to assess the strength of group differences across the various domains. For analyses of variance an effect size of .10 represents a small effect, .25 a medium effect and .40 a large effect (Cohen, 1988).

Infancy to preschool (0-4 years)

The variables included in the MANOVAs performed for this developmental stage are summarised in Table 10. The majority were assessed by parent report. There were no significant multivariate differences between the three groups (*low/non antisocial, experimental, persistent*) during any of the pre-school years[9].

Table 10 **Summary of variables included in analyses (0-4 years).**

VARIABLES	YEARS			
	0-1	1-2	2-3	3-4
Pregnancy and Birth				
Gestational age	✓	--	--	--
Birth weight	✓	--	--	--
Family Factors				
Age of parents at child's birth	✓	--	--	--
Position in birth order	✓	--	--	--
Ethnic background of parents	✓	--	--	--
Educational level of parents	✓	--	--	--
Occupation of parents	✓	--	--	--
Socioeconomic status	✓	✓	✓	✓
Temperament				
Approach-sociability	✓	✓	✓	✓
Rhythmicity	✓	✓	✓	✓
Co-operation	✓	✓	✓	--
Activity-reactivity	✓	✓	✓	--
Irritability	✓	✓	✓	--
Persistence	--	✓	✓	✓
Inflexibility	--	--	--	✓
Behaviour Problems				
Problem behaviours – total score	✓	✓	✓	✓
Behaviour checklist – total score	--	--	✓	✓
Aggression-hostility	--	--	✓	✓
Anxious-fearful	--	--	--	✓
Hyperactivity-distractibility	--	--	--	✓
Mother-Child Relationship				
Mother's rating of child difficulty	✓	✓	✓	--
Nurse's rating of child difficulty	✓	--	--	--
Nurse's rating of adjustment of mother-baby pair	✓	--	--	--

The primary school years (5-6 through 11-12 years)

A number of group differences emerged during the primary school years. These are summarised in Table 11 (over page)[10], while the detailed results are displayed in Appendix 3.

At *5-6 years* of age, which was the first year of primary school for most of the children in the study, significant group differences were found between the *persistent* and the *low/non antisocial* group. However, these parent-reported differences were relatively weak in terms of effect size criteria[11]. At *7-8 years,* more consistent and powerful group differences were found for teacher-reported temperament and behaviour problem measures, with the *persistent* group displaying more problematic temperament styles (less able to maintain attention, more volatile) and higher levels of acting out, aggressive and hyperactive behaviour problems than the other two groups. The differences found were in the small effect size range. At *9-10 years* there was a trend for multivariate group differences, but the strength of these differences did not reach the adjusted significance level[12]. At *11-12 years* (Grade 6 for most children), parents, teachers and children all rated the *persistent* group as significantly more aggressive and hyperactive than the *low/non antisocial* group. The *persistent* group was also rated as being less cooperative, lower in self-control than the *low/non antisocial* group; and as more difficult; having less adaptive temperament styles (more active and volatile according to parents; less persistent and able to maintain attention according to parents and teachers). They were also more likely to have friends who engaged in antisocial behaviour (although such friendships were relatively rare at this age). Additionally, the *persistent* group was more depressed (by their own and teacher report); and had poorer relationships with parents and were less empathic and confident by their own report, than those in the *low/non antisocial group*. Differences were in the small effect size range.

9 At 0-1 years, $F(40, 1508) = 0.04$, $p>.05$; at 1-2 years, $F(16, 1188) = 0.02$, $p>.05$; at 2-3 years, $F(20, 1306) = 0.03$, $p>.05$; and at 3-4 years, $F(16, 1652) = 0.02$, $p>.05$).

10 Significance levels and effect sizes are shown, as are the results of the Scheffe post-hoc comparisons. The variables included in the analyses for which no significant differences were found are listed below the table.

11 Lower than the .10 cut-off for a small effect size

12 The Bonferroni adjusted significance level of 0.0025 or lower

Table 11 **Comparison of the low/non antisocial (L), experimental (E) and persistent (P) groups over the primary school years.**

Domains	Effect Size	Results
5-6 YEARS (1988)		
Parent Report F(18,1812) = 2.31**		
Temperament		
■ Inflexibility*	--	No two groups significantly differ
Behaviour Problems		
■ Anxiety*	--	P less anxious/fearful than L
Teacher Report		
No significant multivariate differences between the groups, F(14, 1708) = 1.53		
7-8 YEARS (1990)		
Parent Report		
No significant multivariate differences between the groups, F (24, 1864) = 1.20		
Teacher Report F(18, 1548) = 2.46**		
Temperament		
■ Reactivity*	S	No two groups significantly differ
■ Task Orientation**	S	P lower task orientation than E & L
Behaviour Problems		
■ Aggression**	S	P more aggressive/hostile than E & L
■ Hyperactivity**	S	P more hyperactive than E & L
9-10 YEARS (1992)		
Parent Report F (24, 1856) = 1.79* (trend)		
Behaviour Problems		
■ Aggression**	S	P more aggressive/hostile than L
■ Hyperactivity**	S	P more hyperactive than L
Family Factors		
■ No. of Negative Family Changes*	S	No two groups significantly differ
Social Competence		
■ Self-Confidence**	S	P more self-confident than L
11-12 YEARS (1994)		
Parent Report F (38, 1726) = 2.09***		
Temperament		
■ Activity***	S	P more active than E & L
■ Negative Reactivity**	S	P more reactive than L
■ Task Persistence***	S	P less task persistent than E & L
Behaviour Problems		
■ Aggression**	S	P more aggressive/hostile than L
■ Hyperactivity*	S	P more hyperactive than L
Parent-child Relationship		
■ Quality of Parent-Child Relationship*	--	P poorer relationship quality than L
Social Competence		
■ Co-operation*	S	P less co-operative than L
■ Self-Control*	S	P less self-control than L
Peer Relationships		
■ Antisocial Peer Affiliations***	S	P more antisocial peer affiliations than E & L
Child Report F (24, 1886) = 3.82***		
Behaviour Problems		
■ Aggression***	S	P more aggressive/hostile than L
■ Depression**	S	P more depressed than L
■ Hyperactivity**	S	P more hyperactive than L
Parent-child Relationship		
■ Relationship with Parents***	S	P poorer relationship than E & L
Social Competence		
■ Assertiveness***	S	P less assertive than E & L
■ Co-operation***	S	P less co-operative than E & L
■ Empathy*	--	P less empathic than L
■ Self–Control***	S	P lower self-control than L
Teacher Report F(20, 1644) = 2.74***		
Temperament		
■ Task Orientation***	S	P lower task orientation than L
Behaviour Problems		
■ Aggression***	S	P more aggressive/hostile than E & L
■ Depression*	S	P more depressed than L
■ Hyperactivity*	--	P more hyperactive than L
Social Competence		
■ Assertiveness*	--	No two groups significantly differ
■ Co-operation***	S	P less co-operative than L
■ Self-Control***	S	P lower self-control than L

L = Low/non antisocial; E = Experimental, P=Persistent * p<.05; ** p<.01; *** p<.001 S = small effect size; M = medium effect size; L = large effect size; -- = very small effect size (less than .10)

There were no significant differences on :

Parent report of approach-sociability, task-persistence, rhythmicity, aggression, hyperactivity, quality of parent-child relationship and socioeconomic status at 5-6 years; approach-sociability, task persistence, rhythmicity, anxiety-fearfulness, hyperactivity, quality of parent-child relationship, parent's coping skills, parent's rating of life difficulty, family stress and socioeconomic status at 7-8 years; anxiety-fearfulness, negative emotionality, shyness, sociability, activity, empathy, quality of parent-child relationship and socioeconomic status at 9-10 years; anxiety-fearfulness; approach-sociability, assertiveness, depression, responsibility, peer relationships, mother's educational level, father's educational level, father's occupation, and number of children in family at 11-12 years;

Teacher report of all temperament, behaviour problem and school readiness measures at 5-6 years; flexibility, anxiety-fearfulness, academic skills, reading ability and social skills at 7-8 years; anxiety-fearfulness, academic skills and peer relationships at 11-12 years; and

Child report of anxiety-fearfulness, self concept concerning peer relationships and quality of friendships at 11-12 years.

Overall, these results reveal clear and consistent differences between the *persistent* and *low/non antisocial* groups, from the middle childhood years to the end of primary school. Several significant differences between the *persistent* and *experimental* groups were evident over the primary school years. The domains in which such differences were found were the temperament factors of task orientation /persistence at 7-8 and 11-2 years; aggression at 7-8 and 11-12 years; hyperactivity at 7-8 years; and activity, antisocial peer affiliations, relationships with parents, self confidence and cooperation at 11-12 years. On these, the *persistent* group showed less positive characteristics than the *experimental* group.

The *experimental* and *low/non antisocial* groups were not significantly different on any domain or at any timepoint over the primary school years, suggesting that they were very similar at this developmental stage.

The secondary school years

Comparisons of groups over the secondary school years revealed numerous differences. Tables 12(a), (b), (c), and (d) summarise these differences, while more detailed results are displayed in Appendix 4. The variables included in the analyses for which no significant differences were found are listed below the tables.

At 12-13 years (Table 12a), which was the first year of secondary schooling for most young people, the *persistent* group was significantly more dysfunctional over a range of domains. These included temperament style (activity, volatility, and ability to maintain attention on tasks), behaviour problems (aggression, hyperactivity and depression), and social skills (particularly cooperation, empathy and self control). They also tended to have poorer relationships with parents; experienced more problems at school; and reported higher levels of eating disordered behaviour. While most differences were between the *persistent* and *low/non antisocial* groups, on several domains the *persistent* group was also more problematic than the *experimental* group.

For the first time, significant differences between the *experimental* and *low/non antisocial* groups were evident on a small number of variables: school problems (as reported by both parents and teenagers), and cooperation.

Most group differences were in the small effect size range, although on several self-report measures differences were in the medium effect size range (self- reported aggression, cooperation, self control and school problems).

At 13-14 years (Table 12b), group differences were found on the same domains as at 12-13 years. Additionally, the *low/non antisocial* group tended to receive better quality parenting (more supervision and monitoring: parental knowledge of their child's activities and social contacts; greater warmth: more enjoyment of each other's company and perception of closeness) than the *persistent* and *experimental* groups (according to parents), and individuals in this group reported higher attachment to their

Table 12a **Comparison of the low/non antisocial (L), experimental (E) and persistent (P) groups at 12-13 years.**

Domains	Effect Size	Results
PARENT REPORT F(24, 1748) = 3.02***		
Temperament		
■ Activity**	S	P more active than E & L
■ Negative Reactivity*	--	P more reactive than L
■ Task Persistence***	S	P less task persistence than L
Behaviour Problems		
■ Aggression**	S	P more aggressive/hostile than L
■ Hyperactivity**	S	P more hyperactive than L
Parent-child Relationship		
■ Quality – Parent-Teen Relationship***	S	P poorer relationship quality than E & L
School Adjustment and Achievement		
■ School Difficulties***	S	P & E more school difficulties than L
TEEN REPORT F(26, 1692) = 7.00***		
Behaviour Problems		
■ Aggression***	M	P more aggressive/hostile than E & L
■ Depression*	--	P more depressed than L
■ Hyperactivity***	S	P more hyperactive than L
Eating Behaviours		
■ Bulimia**	S	P more bulimic behaviours than L
Social Competence		
■ Co-operation***	M	P & E less co-operative than L P less co-operative than E
■ Empathy**	S	P less empathic than E & L
■ Self-Control***	M	P lower self-control than E & L
School Adjustment and Achievement		
■ School Difficulties***	M	P & E more school problems than L P more school problems than E

L = Low/non Antisocial; E = Experimental, P =Persistent
* p<.05; ** p<.01; *** p<.001
S = small effect size; M = medium effect size; L = large effect size; -- = very small effect size (less than .10)
There were no significant differences on :
Parent report of: anxiety-fearfulness, approach-sociability, depression, socioeconomic status, and family stress at 12-13 years; and **Child report** of: anxiety-fearfulness, assertiveness, self-concept re physical appearance, body dissatisfaction, and drive to be thin at 12-13 years.

parents. Parents of persistently antisocial individuals were more likely to smoke cigarettes or drink alcohol than parents of *low/non antisocial* adolescents, and the *persistent* group was more attracted to adventurous risk-taking activities than the *low/non antisocial* group.

The *persistent* and *experimental* groups were similar to each other at this age, and different from the *low/non antisocial* group on many measures. The domains on which both groups were faring significantly worse than the *low/non antisocial* group were: behaviour problems (aggression, oppositionality and hyperactivity), parental supervision and warmth, mothers' cigarette and alcohol use, school difficulties, antisocial peer affiliations, lower attachment to parents, and lower cooperation and self control.

Table 12b **Comparison of the low/non antisocial (L), experimental (E) and persistent (P) groups at 13-14 years.**

Domains	Effect Size	Results
PARENT REPORT F (54, 1774) = 3.96***		
Temperament		
Activity**	S	P more active than L
Negative Reactivity**	S	P more reactive than L
Task Persistence***	S	P less task persistence than L
Behaviour Problems		
Attention Problems***	S	P & E more attention difficulties than L
Conduct Disorder***	S	P & E higher conduct disorder than L
Socialised Aggression***	M	P & E higher socialised aggression L P higher socialised aggression than E
Parent-child Relationship		
Quality of Parent-Teen Relationship***	S	P poorer relationship quality than L
Parenting Practices		
Monitoring***	S	P & E lower parental monitoring than L
Harsh Discipline**	S	P more harsh discipline than L
Warmth of Relationship***	S	P & E less warmth in parent-teen relationship than L
Parental Substance Use		
Father's Substance Use**	S	P higher paternal substance use than L
Mother's Substance Use***	S	P & E higher maternal substance use than L
Social Competence		
Co-operation*	--	P less co-operative than L
Responsibility**	S	P less responsible than L
Self-Control***	S	P lower self-control than L
School Adjustment and Achievement		
School Difficulties***	M	P & E more school difficulties than L
Peer Relationships		
Antisocial Peer Affiliations***	M	P & E more antisocial peer affiliations than L P more antisocial peer affiliations than E
Participation in Organised Peer Activities**	S	P lower participation in organised peer group activities than L
TEEN REPORT F (30, 1828) = 12.19***		
Behaviour Problems		
Anxiety*	S	P less anxious/fearful than L
Depression**	S	P more depressed than L
Hyperactivity***	M	P & E more hyperactive than L
Oppositional Behaviour***	L	P & E more oppositional than L P more oppositional than E
Parent-child Relationships		
Attachment to Parents***	S	P & E lower attachment than L
Social Competence		
Assertiveness**	S	P more assertive than L
Co-operation***	M	P & E less co-operative than L
Empathy**	S	P less empathic than E & L
Self-Control***	M	P lower self-control than E & L E lower self-control than L
School Adjustment and Achievement		
School Difficulties***	M	P more school difficulties than E & L E more school difficulties than L
Peer Relationships		
Attachment to Peers*	--	P lower peer attachment than L
Friends' Involvement in Antisocial Activities***	L	P more friends involved in antisocial activities than E & L E more friends involved in antisocial activities than L
Interests		
Breadth of Interests***	S	P greater breadth of interests than L
Depth of Interests*	--	No two groups significantly differ

L = Low/non antisocial; E = Experimental, P =Persistent
* p<.05; ** p<.01; *** p<.001
S = small effect size; M = medium effect size; L = large effect size;-- = very small effect size (less than .10)
There were no significant differences on :
Parent report of: anxiety-withdrawal, approach-sociability, task persistence, assertiveness, obedience orientation, peer involvement, mothers's use of inductive reasoning, physical punishment, socioeconomic status, and paternal unemployment at 13-14 years; and
Child report of: friendship quality at 13-14 years.

The *persistent* group was also more oppositional, less cooperative and more involved with antisocial peers than the *experimental* group. A larger number of medium and large effect size differences were found on aspects such as aggressive and oppositional behaviour problems, school difficulties, antisocial peer affiliations, cooperation and self control.

At 15-16 years (Table 12c), significant group differences were evident on most domains. About two-thirds of these differences were between the two antisocial groups, on the one hand, and the *low/non antisocial* group, on the other (on aspects of temperament/personality - task persistence, negative reactivity, conscientiousness, risk taking; on behaviour problems - attention problems/hyperactivity, aggression, oppositionality, depression; on the assertiveness social skills dimension; on school adjustment; on peer relationships - antisocial peer affiliations and peer involvement; and on parenting style - parental monitoring/supervision and warmth of relationship).

While in general the *persistent* and *experimental* groups were similar to each other at 15-16 years, and both "worse" than the *low/non antisocial* group; on some variables only the *persistent* group (but not the *experimental* group) differed from the *low/non antisocial* group (primarily, the activity temperament factor, conduct disorder, social competence, involvement in organised peer group activities, parental use of punishment). As in the primary school years, there were also some domains in which the *persistent* group was significantly lower than both the *experimental* and *low/non antisocial* groups (parent-teen relationships, the personality factor of agreeableness, and both aspects of civic mindedness). Just over half the group differences were in the medium or large effect size range. These more powerful differences were on task persistence, aggression, oppositional and hyperactive behaviour problems, attraction to risk taking, school adjustment and antisocial peer affiliations.

Thus, from 11 to 16 years (Table 12d), differences between the *persistent* and *low/non antisocial* groups strengthened, and the *experimental* group began to resemble the *persistent* group. Consistent and powerful differences between the *experimental* and *low/non antisocial* groups were also found.

The data at *17-18 years* (Year 12 for most participants) suggest that a different pattern of group differences may be emerging. Differences tended to be smaller, with relatively few medium and large effect sizes.

On some variables the two antisocial groups were both significantly different from the *low/non antisocial* group (on aggressive and hyperactive problems, antisocial peer affiliations, tendency to cope with difficulties by using drugs, and family cohesion). On others, the *persistent* group was significantly different from the *low/non antisocial* , but not the *experimental* group (on negative reactivity, intellect /openness, identity clarity, and adolescent and parent report of positive and negative aspects of their relationships). However, the general pattern was for the majority of group differences to be between the *persistent* group and the other two groups. Differences were on aspects such as personality style (agreeableness, conscientiousness, emotional control), behaviour problems (conduct disorder and oppositionality), coping style (coping with problems by ventilating feelings), optimism about the future, and quality of parent-child relationship. It seemed that at this age, the *experimental* group was becoming more like the *low/non antisocial* group rather than the *persistent* group.

In summary, the three groups *(low/non antisocial, experimental and persistent)* were indistinguishable during infancy and early childhood. The first group differences emerged at five to six years. Differences were on only a few variables and relatively weak in magnitude.

During the early primary school years, group differences typically centred upon temperament (for example, reactivity, task persistence) and behaviour problems (for example, aggression, hyperactivity). However, at the late primary school stage, significant group differences in social competence, relationships with parents, and association with antisocial peers also emerged.

Most group differences were between the *persistent* and *low/non antisocial* groups, with the former group exhibiting more difficulties. The *experimental* group were not identifiably different from the *low/non antisocial* group on any variables at any timepoint during the primary school years, but were often significantly better functioning than the *persistent* group.

By the commencement of secondary school, the first relatively strong group differences emerged. At this time, the differences between the *persistent* and *low/non antisocial* groups were more clearly marked, with the *persistent* group appearing to be significantly more dysfunctional over a wide range of domains than those in the other group/s.

The first differences between the *experimental* and *low/non antisocial* groups also emerged at this time. As the secondary school years progressed (13-14 and 15-16 years) the two antisocial groups became increasingly similar, exhibiting more problematic behaviour, more school difficulties, experiencing poorer quality parenting, and associating more frequently with antisocial peers than those in the *low/non antisocial* group. However, group means generally revealed the *persistent* group to be more dysfunctional than the *experimental* group.

Towards the end of secondary school (ages 17-18 years), this pattern of group differences appeared to change, with the majority of group differences appearing between the *persistent* group and the other two groups.

Table 12c Comparison of the low/non antisocial (L), experimental (E) and persistent (P) groups at 15-16 years.

Domains	Effect Size	Results
PARENT REPORT F (46, 1846) = 5.49***		
Temperament/Personality		
■ Activity**	S	P more active than L
■ Negative Reactivity***	S	P & E more reactive than L
■ Task Persistence***	M	P & E less task persistence than L P less task persistence than E
Behaviour Problems		
■ Attention Problems***	S	P & E more attention problems than L
■ Conduct Disorder***	S	P higher conduct disorder than L
■ Socialised Aggression***	M	P & E higher socialised aggression than L
Parent-child Relationship		
■ Quality of Parent-Teen Relationship***	S	P poorer relationship quality than E & L
Parenting Practices		
■ Monitoring***	S	P & E lower parental monitoring than L
■ Use of Punishment***	S	P more punishment than L
■ Warmth***	S	P & E less warmth in parent-teen relationship than L
Social Competence		
■ Assertiveness***	S	P more assertive than L
■ Responsibility**	S	P less responsible than L
■ Self-Control***	S	P lower self-control than L
School Adjustment and Achievement		
■ School Difficulties***	M	P & E more school difficulties than L
Peer Relationships		
■ Antisocial Peer Affiliations***	M	P & E more antisocial peer affiliations than L P more antisocial peer affiliations than E
■ Participation in Organised Peer Group Activities*	--	P lower participation in organised peer group activities than L
■ Involvement with Peers/Friends***	S	P & E higher involvement than L
TEEN REPORT F (46, 1832) = 9.64***		
Temperament/Personality		
■ Agreeableness***	S	P less agreeable than E & L
■ Conscientiousness***	S	P & E less conscientious than L
■ Emotional Control*	--	P lower emotional control than L
■ Extraversion**	S	P more extraverted than L
■ Neuroticism*	--	P less neurotic than L
Sensation -Seeking and Risk- Taking		
■ Risk-Taking***	M	P & E higher risk-taking than L
■ Sensation-Seeking**	S	P higher thrill and sensation-seeking than L
Behaviour Problems		
■ Depression***	S	P & E more depressed than L
■ Hyperactivity***	M	P & E more hyperactive than L P more hyperactive than E
■ Oppositional Behaviour***	L	P & E more oppositional than L P more oppositional than E
Social Competence		
■ Assertiveness***	S	P & E more assertive than L
Civic Mindedness		
■ Civic Responsibility/ Efficacy***	S	P lower civic responsibility/efficacy than E & L
■ Prosocial Behaviours**	S	P less prosocial behaviour than E & L
School Adjustment and Achievement		
■ Confidence in Ability/Success***	M	P & E less confident than L P less confident than E
■ Relevance of Schooling***	S	P & E less relevance than L
■ Positive Affect Towards School***	M	P & E less positive affect towards school than L
■ Relationship with Teachers***	M	P & E less positive relationship with teachers than L P less positive relationship with teachers than E
Peer Relationships		
■ Friends' Involvement in Antisocial Activities***	L	P & E more friends engaged in antisocial activities than L P higher antisocial peer activities than E

L = Low/non antisocial; E = Experimental, P =Persistent

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

S = small effect size; M = medium effect size; L = large effect size; -- = very small effect size (less than .10)

There were no significant differences on :

Parent report of anxiety-withdrawal, approach-sociability, mother's use of inductive reasoning, family stress, socioeconomic status and parental unemployment at 15-16 years; and

Child report of: anxiety-fearfulness, openess, friendship quality, political activity, and receiving prestige/status from school at 15-16 years.

Table 12d **Comparison of the low/non antisocial (L), experimental (E) and persistent (P) groups at 17-18 years.**

Domains	Effect Size	Results
PARENT REPORT F (42, 1580) = 6.69***		
Temperament/Personality		
■ Agreeableness***	S	P less agreeable than E & L
■ Conscientiousness***	S	P less conscientious than E & L
■ Intellect/Openness**	S	P lower intellect/openness E & L
■ Persistence***	S	P less task persistent than L
■ Reactivity***	S	P more reactive than L
Behaviour Problems		
■ Attention Problems***	S	P more attention problems than L
■ Conduct Disorder***	S	P higher conduct disorder than E & L
■ Socialised Aggression***	L	P & E higher socialised aggression than L P higher socialised aggression than E
Parent-child Relationship		
■ Parent-Teen Conflict***	S	P more parent-teen conflict than L
■ Positive Parent-Teen Relationship*	--	P less positive parent-teen relationship than L
■ Quality of Parent-Teen Relationship***	S	P poorer relationship quality than E & L
Family Factors		
■ Family Cohesion***	S	P & E lower family cohesion than L
■ Intact Family**	S	P & E less likely to have an intact family than L
■ Marital Conflict**	S	P higher parental marital conflict than L
■ Family Stress*	--	P higher family stress than L
Peer Relationships		
■ Antisocial Peer Affiliations***	M	P & E more antisocial peer affiliations than L
TEEN REPORT F (58, 1970) = 8.48***		
Temperament/Personality		
■ Agreeableness***	M	P less agreeable than E & L
■ Conscientiousness***	S	P less conscientious than E & L
■ Emotional Control***	S	P lower emotional control than E & L
■ Extraversion*	--	E more extraverted than L
Behaviour Problems		
■ Depression*	--	P more depressed than L
■ Hyperactivity***	S	P & E more hyperactive than L P more hyperactive than E
■ Oppositional Behaviour***	M	P more oppositional than E & L
Coping Stategies		
■ Use Drugs***	L	P & E use drugs to cope more than L P use drugs to cope more than E
■ Use Humour*	--	No two groups significantly differ
■ Ventilate Feelings***	M	P cope by ventilating feelings more than E & L
Future Orientation		
■ Optimism***	S	P less optimistic than E & L
■ Identity Clarity**	S	P lower identity clarity than L
Parent-child Relationship		
■ Warmth and Communication**	S	P lower warmth and communication than L
■ Alienation**	S	P more alienation than L

L = Low/non antisocial; E = Experimental, P =Persistent
* p<.05; ** p<.01; *** p<.001
S = small effect size; M = medium effect size; L = large effect size
There were no significant differences on :
Parent report of: anxiety –withdrawal, approach-sociability, extraversion, neuroticism, and socioeconomic status at 17-18 years; and **Child report** of: anxiety-fearfulness, neuroticism, openness, self-esteem, attachment to peers (communication), attachment to peers (trust), attachment to peers (alienation), attachment to mother (trust), attachment to mother (monitoring), coping (support seeking), coping (via diversion), coping (wishful thinking), cope (independence), the future (desire for privacy), the future (readiness for intimacy) at 17-18 years.

Predictors of antisocial behaviour by domain of functioning

Following the description of group trends at different ages and stages of development, we now examine the extent and strength of differences between the three groups *(low/non antisocial, experimental and persistent)* across various domains of functioning to determine whether particular profiles may be identified for the three groups. This discussion draws on the data already presented in Tables 11 and 12 (a), (b), (c) and (d). Domains relating to personal functioning will be presented first, followed by domains related to family and peer relationships.

Temperament/personality

Clear temperamental differences were consistently observed between the *persistent* group and the *low/non antisocial* group. From mid-childhood onwards, the *persistent* group was frequently rated as being more reactive, volatile and emotional than individuals in the *low/non antisocial* group. This high reactivity continued to be evident well into adolescence. The *persistent*

group consistently reported ongoing difficulties in their ability to control emotional responses to events. The *persistent* group also exhibited greater difficulties remaining focused on activities or tasks, and were frequently rated by parents as exhibiting higher activity levels than their *low/non antisocial* peers. During mid-to-late adolescence, the *persistent* group rated themselves as being more outgoing than the *low/non antisocial* group.

It was difficult to identify a clear temperamental profile for the *experimental* group. For example, at times during the primary school years, the *experimental* group resembled the *low/non antisocial* group, attending better to tasks and activities, and exhibiting lower activity levels than those in the *persistent* group. However, during early-to-mid adolescence, the *experimental* group displayed some of the temperamental characteristics of the *persistent* group (for example, low task persistence, high negative reactivity, low conscientiousness). Around mid-to-late adolescence, the pattern changed again, with the *experimental* group resembling the *low/non antisocial* group more closely on many personality traits (for example, more agreeable, more conscientious, more open to ideas than the persistent group).

The three groups did not differ in their levels of sociability prior to adolescence, or rhythmicity (regularity, predictability) at any time.

Sensation seeking and risk taking

The *persistent* group rated themselves as taking more risks, seeking more sensations and thrills, and having an interest in a broader range of activities than those who engaged in no or little antisocial behaviour. The *experimental* group also reported taking more risks than those in the *low/non antisocial* group, although they were significantly lower than the *persistent* group on this measure.

Behavioural and emotional problems

As with temperamental characteristics, clear differences were noted between the *persistent* and *low/non antisocial* group in the level of behavioural problems exhibited. These differences were repeatedly observed over multiple data collection waves, and by more than one source. Most notably, the *persistent* group was consistently observed to engage in more frequent "externalising", "acting out" behaviours (for example, aggression, hyperactivity, oppositional behaviour) than individuals in the *low/non antisocial* group. In addition, their parents rated them as having more attention difficulties.

Besides these differences in externalising behaviour problems, some differences in the internalising spectrum (for example, depression, anxiety) also emerged. Individuals in the *persistent* group consistently rated themselves as being more depressed than the *low/non antisocial* group (an observation also made by their teachers at 11-12 years of age), although there were no group differences in parental ratings of children's depression levels at any stage. Interestingly, despite the high co-occurrence of depression and anxiety problems noted in previous research (Cicchetti and Toth 1998), the three groups generally did not differ in their levels of anxiety (with the exception of ages 5-6 and 13-14 at which the *low/non antisocial* group were reported as more anxious than the *persistent* group).

As with temperamental factors, the pattern of behavioural problems exhibited by those in the *experimental* group appeared to be less severe and tended to change over time. For example, from the ages of 7-8 to 12-13, the *experimental* group was consistently less aggressive than the *persistent* group. However, from the age of 13-14 on, the *experimental* group exhibited many of the same behavioural problems as the *persistent* group engaging in more acting out behaviours (hyperactivity, oppositional behaviour, socialised aggression) and exhibiting more attention difficulties than those in the *low/non antisocial* group. Once again, there appears to have been a decrease in this behaviour at 17-18 years, with the *experimental* group engaging in less oppositional, and norm-defying behaviour than the *persistent* group.

School adjustment and achievement

Substantial differences were observed between the groups in their levels of adolescent school adjustment and achievement. These differences were not evident in primary school. For example, the three groups did not differ in teacher ratings of readiness for school (at 5-6 years), reading skills assessed via a standardised test (at 7-8 years) or teacher ratings of academic skills (at 7-8 and 11-12 years). But by the secondary school years, both parents and teenagers consistently reported that individuals in the two antisocial groups were experiencing more school difficulties than those in the *low/non antisocial* group.

The measure used to assess school adjustment in adolescence encompassed various aspects of school life, including managing school rules and routines, completing homework and assignments, understanding the work in class, achieving a satisfactory standard, and getting on with teachers. Thus, it is a broader measure than academic achievement. While parent reports suggested that the *experimental* and *persistent* groups were experiencing a similar level of difficulties, self-reports indicated that these difficulties were significantly more pronounced among the *persistent* group.

Clear group differences were also evident in teenagers' attitudes to school. Individuals in the *low/non antisocial* group reported more positive feelings towards school, more positive relationships with teachers, more confidence in their ability to succeed at school, and were more likely to perceive their schooling as relevant for future life, than those in the other two groups. The *persistent* group reported significantly less confidence in their ability to succeed at school, and less positive relationships with teachers than those in the *experimental* group.

Social competence

Levels of social competence clearly differed between the groups, particularly in the areas of cooperation and self-control. For example, parent and teenager reports frequently revealed the *persistent* group to be less cooperative and less self-controlled than individuals who engaged in little or no antisocial behaviour. These differences were strongest during the early adolescent years (12-14 years), and when reported by the teenagers themselves. The *persistent* group were also noted to be less empathic, less responsible and more assertive than those in the *low/non antisocial* group[13].

Differences in the social skills of the *experimental* group and the other two groups are harder to summarise. In some ways the *experimental* group was similar to the *low/non antisocial* group as they rated themselves as more empathic and more self-controlled than those in the *persistent* group. However, unlike the *low/non antisocial* group, at times they rated themselves as quite uncooperative.

Eating behaviours

During early adolescence (12-13 years) teenagers were questioned about eating behaviours and their perceptions of their body. The three groups did not differ on their self-concept of their physical appearance, their body dissatisfaction or their desire to be thin. However, the *persistent* group did report engaging in more bulimic (bingeing and purging) behaviours than those in the *low/non antisocial* group.

Coping strategies

Significant differences in the coping strategies adopted by the three groups were observed. Both the antisocial groups revealed a stronger reliance on the use of drugs (including cigarettes and alcohol) to help them cope with difficulties than the *low/non antisocial* group, and individuals in the *persistent* group were more likely to ventilate their feelings than individuals in the other two groups. The groups did not differ in their use of other coping strategies such as support-seeking, diversion-seeking, wishful thinking, or independence.

Civic mindedness

The *persistent* group demonstrated lower levels of social responsibility and reported fewer prosocial behaviours than those in the *experimental* and *low/non antisocial* groups.

Future aspirations

At 17-18 years, teenagers were asked about their future aspirations. Individuals in the *low/non antisocial* and *experimental* groups reported greater optimism for the future. Individuals in the *low/non antisocial* group also had a clearer idea of the type of person they wished to become. The groups did not differ in their desire for privacy or readiness for intimacy.

Peer relationships

The groups differed significantly in the characteristics of the peers they associated with. Based on their own and parents' reports, individuals in the two antisocial groups were consistently more likely to socialise with peers who engaged in antisocial activities than adolescents in the *low/non antisocial* group. Parents of *persistent* and *experimental* teenagers also reported that their children were more involved with their peers (made friends easily, interacted with a number of peers) than were *low/non antisocial individuals*.

On the other hand, individuals in the *low/non antisocial* group were observed to participate more often in organised peer group activities than those in the *persistent* group (at 13-14 and 15-16 years) and to report higher attachment to their peers (at 15-16 years). The groups did not differ in their ratings of friendship quality (at 13-14 and 15-16), or their levels of trust, communication, and alienation from peers (at 17-18 years).

Taken together, these findings suggest that, while the groups did not differ in the quality of their friendships, the *low/non antisocial* group members were more attached to their peers and tended to interact with them in a structured setting (for example, while playing sport). The *persistent* group, on the other hand, appeared to spend more time with peers, but their time together was more likely to be unstructured, and more of their peers were antisocial.

Family factors

There were few differences between the groups on family sociodemographic characteristics. The three groups did not differ significantly on parents' ages at child's birth; parents' ethnic, educational, and occupational background; parents' employment status; family socioeconomic status or the number of children in the family. Neither did they differ on child's birth weight, child's gestational age, or the child's position in the birth order.

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13 The exception to this was at 11-12 years, when the 'persistent' group were observed to be less assertive than the other two groups. However, the findings regarding assertiveness may be due to a change in the content of the assertiveness scale over childhood and adolescence. While childhood items assessed general confidence and skill in interacting with others, adolescent items focused primarily on interactions with the opposite sex and dating.

There were also few group differences in the degree of family stress reported by parents. However, by the age of 17-18 years, those in the two antisocial behaviour groups were less likely to belong to an "intact" family unit – that is, one that has not been disrupted by the death of a parent or a breakdown in the parental relationship (66.9 per cent *persistent* and 69.0 per cent *experimental* compared with 80.7 per cent *low/non antisocial)* and parents of the *persistent* group reported higher levels of marital conflict. At this timepoint parents of *persistent* individuals also reported significantly higher levels of family stress, and lower family cohesion, than parents of the *low/non antisocial* group.

Parenting practices and characteristics

At both timepoints at which parents' reports of their parenting practices were sought (13-14 years and 15-16 years), consistent group differences emerged. These findings suggest that the *low/non antisocial* group received better quality of parenting than the *experimental* and *persistent* groups, in that adolescents' behaviour was supervised to a greater extent, and their relationship with their parents was warmer than that of the two antisocial groups. Furthermore, parents of *persistent* antisocials reported using harsh discipline more frequently than parents of the *low/non antisocial* and *experimental* groups. There were no significant differences between the groups in mothers' use of inductive reasoning (use of explanation and reasoning to control child) or physical punishment (as reported by their parents during early adolescence) or teenager's reports of maternal supervision at 17-18 years.

Parental substance use

Information was also obtained from parents about their smoking and drinking habits. Mothers and fathers of *persistent* individuals were more likely than parents of the *low/non antisocial* group to smoke and/or drink alcohol, while mothers of the *experimental* group were more likely than mothers of the *low/non antisocial* group to smoke and/or drink alcohol.

Parent-Child Relationship

Differences in the quality of the parent-child relationship were evident from late childhood onwards, with parents of those in the *low/non antisocial* group consistently rating their child/teenager as easier to get on with than parents of individuals in the *persistent* group. At the most recent data collection wave, parents of the *low/non antisocial* group reported less conflict with their teenager, and more positive aspects to their relationship, than parents of *persistently* antisocial adolescents.

Teenagers' self-reports were in agreement with these findings, with the *low/non antisocial* group members perceiving themselves to have a better relationship with their parents (at age 11-12), feeling more attached to parents (at 13-14 years), and reporting higher warmth, higher communication, and less alienation from their parents (at 17-18 years) than members of the *persistent* group.

Overall, the quality of the parent-child relationship was similar among members of the *experimental* and *low/non antisocial* groups. Only at 13-14 years did individuals in the *experimental* group report lower attachment to parents than *low/non antisocial* group members.

In summary, the three groups differed over a wide range of domains encompassing individual characteristics, the features of the child/teenager's family, school, and the peers they associated with. The strongest differences were observed in the areas of temperament, behavioural problems, coping skills, social competence, school adjustment and peer relationships, and levels of risk-taking behaviour.

Many of the differences observed in individual characteristics (such as civic-mindedness, aspirations for the future), and the family environment (for example, family factors, parenting practices, parental substance use, relationship with parents) were small in magnitude.

The *persistent* group was consistently more volatile, had more difficulty attending to tasks or activities and displayed more aggressive/oppositional behaviours, than those in the *low/non antisocial* group, from quite a young age.

Multiple sources of report also suggested that the *persistent* group were less cooperative and less self-controlled than *low/non antisocial* youth, exhibited consistent school adjustment difficulties in adolescence, and associated more frequently with antisocial peers than individuals in the other two groups. *Persistent* antisocial individuals also reported relying upon the use of drugs and the ventilation of feelings to cope with life difficulties to a greater extent than those in the *low/non antisocial* group. They were also more attracted to risk-taking activities.

The characteristics of the *experimental* group were less distinct. During the primary school years, the *experimental* group did not differ significantly from the *low/non antisocial* group on any aspect, but were better functioning than the *persistent* group in many domains.

Once the *experimental* group reached adolescence, they resembled the *persistent* group on many temperamental characteristics (for example, low task persistence, high negative reactivity, low conscientiousness) and behavioural

problems (for example, hyperactivity, oppositional behaviour, socialised aggression). The *experimental* group also experienced more school adjustment problems, associated more frequently with antisocial peers, and were less cooperative, than those in the *low/non antisocial* group. They were also were more likely to use drugs to cope with life stress and to engage in risk-taking activities.

The *experimental* group was generally not as dysfunctional as the *persistent* group, and their difficulties appeared to lessen as they approached the end of secondary school.

Gender differences in predictors of antisocial behaviour

The three groups differed significantly in gender composition. There were significantly more males than females in the *persistent* group, and slightly more females than males in the *experimental* and *low/non antisocial* groups. Gender is a notable risk factor for antisocial behaviour. Thus, analyses in which gender is controlled may provide a somewhat misleading picture, as they effectively cancel out the contribution of this powerful risk factor. However, for reader interest we report briefly findings from analyses in which gender was controlled, in order to examine the impact of gender differences on findings[14]. The results of these analyses are shown in Appendix 5.

In brief, these analyses revealed a similar pattern of findings to those previously described. The three groups did not differ during infancy and the preschool years, and the group differences found thereafter were generally in the same domains, and at the same timepoints, as those previously outlined. However, group differences were generally less powerful, and fewer differences were observed during the early-to-mid primary school years. This suggests that the results previously described may, to a certain extent, be influenced by gender differences, presumably because boys, who were more numerous in the *persistent* group, also tend to have more difficult characteristics. Nevertheless, group differences were generally robust across both sets of analyses (that is, those in which the effects of gender were controlled and those in which the effects of gender were not controlled).

The question of whether the pattern of predictors of antisocial behaviour differed across males and females was next examined. Two further sets of MANOVA analyses were conducted for each sex separately. The results of these analyses are summarised in Appendix 6, and briefly described here.

As before, no significant group differences were found until the beginning of primary school (ages 5-6). After this time, group differences emerged for both sexes in many of the domains previously identified (for example, temperament, behaviour problems, social competence, relationships with parents, school achievement and adjustment, peer relationships etc). However, there were fewer group differences than in previous analyses. At most timepoints the pattern of differences was similar across the sexes in terms of domains of functioning, although at particular timepoints significant differences were evident for one sex and not the other. For example, among girls at 5-6 years but not 7-8 years, group differences were found on levels of aggression, while differences in aggression were found among males at 7-8 years but not 5-6 years.

While these sex-specific analyses suggested fewer differences between the groups, it should be noted that group sizes were very small. Hence, the power of the sex-specific analyses was considerably reduced, making it more difficult to detect group differences, and to base confident conclusions on the findings of this set of analyses.

14 Using Multivariate Analyses of Covariance (MANCOVAs) for each data collection wave, and each source of report, with sex entered first to control for its effect.

6 *Discussion of findings and implications*

Based on the findings described above, the following conclusions can be drawn about the factors which characterise individuals who report involvement in antisocial behaviour.

Persistent antisocial behaviour

A number of factors clearly and consistently characterised individuals who engaged in persistent antisocial behaviour. These were:

- more 'difficult' temperamental characteristics, such as a more intense, moody, irritable style, as well as difficulties remaining focused on tasks or activities (from early primary school on);
- consistent behaviour problems, particularly aggression, hyperactivity, oppositional/defiant behaviour, (from primary school on) and depression from late childhood on;
- lower self-control and persisting uncooperativeness (from late primary school on);
- consistent school difficulties and a negative attitude to school (from early secondary school on);
- association with antisocial peers (from late primary school on);
- a tendency to use drugs or to ventilate feelings to cope with life difficulties (during mid adolescence); and
- an attraction to risk-taking activities (during mid adolescence).

Other less powerful predictors of persistent antisocial behaviour included:

- individual characteristics, such as higher activity levels, higher thrill and adventure seeking, lower civic-mindedness, less optimism about the future, and lower identity clarity;
- problematic eating patterns (a tendency to "binge" and "purge");
- family factors, such as disruptions caused by the death of a parent or a breakdown in the parental relationship, higher family stress, and more marital conflict;
- less optimal parenting practices (such as lower parental monitoring, lower warmth, higher punishment);
- parental substance use;
- more problematic parent-child relationship, higher levels of alienation from parents, and lower family cohesion; and
- lower rates of participation in organised group activities and low attachment to peers.

Experimental antisocial behaviour

Predictors of experimental antisocial behaviour were similar to those identified for persistent antisocial behaviour, but were generally not as constant, nor as severe. Among the strongest predictors of experimental antisocial behaviour in the ATP sample were:

- "difficult" temperamental characteristics (for example, higher negative reactivity, lower conscientiousness, difficulties remaining focused on an activity or task) which first emerged during early adolescence and persisted until mid-to-late adolescence;
- behaviour problems such as hyperactivity, oppositional behaviour, aggression, attention problems, that were evident in early adolescence and continued until late adolescence;
- lower cooperativeness (during the early adolescent years);
- school difficulties and a negative attitude to school (during secondary school);
- association with antisocial peers (from the commencement of secondary school);
- a tendency to use drugs to cope with life stress (during mid-adolescence); and
- a preference for risk-taking activities (during mid-adolescence).

Other weaker predictors of experimental antisocial behaviour included:

- family factors (for example, belonging to a family that had suffered a disruption through death or relationship breakdown);
- parenting practices (such as lower parental supervision and warmth, lower punishment) and parental characteristics such as maternal substance use; and,
- lower family cohesion

Developmental pathways

The three groups *(persistent*, *experimental* and *low/non antisocial*) did not differ on any domain during infancy and early childhood. No significant group differences emerged until the early primary school years when the *persistent* group began to

display more difficult temperamental characteristics (for example, lower task orientation) and more problematic behaviour (for example, higher aggression and hyperactivity) than those in the *low/non antisocial* group.

It is possible that our findings concerning the timing of group differences may have partly resulted from sampling factors (for example, low rates of highly disadvantaged children in this community sample), or the omission of important variables during the early years (eg. detailed parenting measures). We compared the profiles of the most highly antisocial members of the *persistent* group (n =26, average number of different antisocial acts = 6.40) and the remainder of the *persistent* group (n= 105, average number of different antisocial acts = 3.26), to investigate the possibility of infant and early childhood difficulties among the most highly antisocial sub-group.

This comparison revealed trends for differences in the early years to the disadvantage of the highly antisocial group, principally in the domains of family socioeconomic status (a composite of both parents' education and occupational status), temperament (for example, cooperativeness), and hostile/aggressive behaviour. However, the group differences were generally not significant, when the adjusted criterion was used [15]. Only at 1-2 years (1984), were group differences significant, when the most highly antisocial individuals were rated as less cooperative, and their families were of lower family socioeconomic status than the remainder of the *persistent* group.

These findings suggest that for a small sub-group of adolescents, who consistently exhibit very high levels of antisocial behaviour throughout adolescence, there were possible indicators of difficulties in the first few years of life. However, in the present study, which utilised a representative sample of Victorian children, these early indicators were relatively weak, possibly due to the small number of highly antisocial individuals in this sample[16]. Overall, for the majority of youth who displayed *persistent* antisocial behaviour in adolescence, substantial temperamental and behavioural differences were not apparent until the early primary school years.

Implications

Taken together, these findings have a number of important implications for understanding the development of antisocial behaviour and for early interventions aimed at preventing this type of behaviour.

1. Some degree of antisocial behaviour is "normal" in adolescence

Consistent with previous research, the findings of this study suggest that some degree of antisocial behaviour is common among adolescents. For example, at 13-14 years, one in three participants had been involved in a physical fight in the past year, and at 17-18 years, over 40 per cent reported having skipped school at least once. Substance use (especially cigarette and alcohol use) was also relatively common, especially during mid-to-late adolescence. These findings add support for the view that some level of antisocial behaviour is "normal" among this age group. However, there are distinct patterns both in the timing, the frequency, and the nature of the antisocial behaviours, which needs to be taken into consideration by prevention strategies.

2. Early intervention to divert children from pathways to persistent antisocial behaviour appears most appropriate during the primary school years

The findings have important implications for the timing of interventions. Homel et al. (1999) make the point that interventions can occur early in life, or early in a pathway. While many assume that early in a pathway means early in life, this is not always true. Few studies of the etiology of antisocial behaviour have the data from infancy and early childhood required to examine this issue, making it difficult to determine the most appropriate timing for interventions.

Targeted interventions, which aim to divert individuals from problematic pathways, cannot begin until early in the pathway, when an individual is identified as being "at-risk" of developing serious and entrenched problems. In relation to *persistent* adolescent antisocial behaviour, our findings suggest that the primary school years are the critical years for identifying the start of pathways to teenage antisocial behaviour for the majority of children, and hence the optimal time for targeted interventions for children identified as "at-risk". This conclusion is based on the observation that there were no differences between any groups until 5 to 6 years of age, the commencement of primary school for most participants, and that differences were consistently and increasingly apparent after that time.

It is widely recognised that interventions during the earliest years of life are critical to the prevention of numerous emotional and behavioural problems (for example, hyperactivity, attention-regulation problems). Hence, more broad-based interventions (for example, home visiting programs), during infancy and early childhood, which aim to prevent the development of problems before they emerge, may prove beneficial. Infants and young children whose sociodemographic and familial characteristics place them at increased risk of later developing antisocial behaviour (for example, low socioeconomic status, parental relationship breakdown, abusive or inept parenting) would particularly benefit from such preventative efforts (Farrington 2002; Homel et al 1999).

15 At the adjusted significance level of $p<0.0025$.

16 This would have resulted in low statistical power to detect differences.

Nevertheless, the current results suggest that when targeting the development of antisocial behaviour, the focus should be on the early primary school years as a crucial period to intervene. This conclusion is consistent with other Australian research. For example, Bor et al. (2001) found that aggressive behaviour at this age (5 years) was the strongest predictor of later antisocial behaviour (at age 14) in a sample of 3, 792 Australian children. There is some empirical support for the potential effectiveness of interventions targeted at early primary school. Prevention programs implemented during the early primary school years have shown considerable success in reducing behaviour problems and preventing the development of later antisocial behaviour (Farrington 2002; Greenwood, Model, Rydell, and Chiesa 1998; Homel et al. 1999). These programs have generally been multi-faceted, involving teacher and parent training in behaviour management skills (for example, monitoring behaviour, using effective discipline, and promoting prosocial behaviours) and child skills training (for example, social, cognitive, and problem solving skills) (Homel et al. 1999).

3. Persistent antisocial adolescents exhibit a clear profile

Another major implication is that individuals who went on to engage in *persistent* antisocial behaviour during adolescence displayed an identifiable profile that included behavioural difficulties and temperamental characteristics. Multiple informants consistently reported these features, from mid-childhood onwards. These individuals were consistently more aggressive, more disinhibited, and more reactive than individuals who later engaged in little or no antisocial behaviour. Furthermore, from late childhood onwards, they were reported to have lower social skills and more likely to have formed antisocial peer friendships. Contrary to previous research, early learning difficulties were not a risk factor for this pattern of antisocial behaviour in this sample, however, a broader measure of academic adjustment did differentiate this group from early adolescence onwards. Given the consistency of these findings, it may be possible for clinicians, teachers, or parents to identify children who are at risk of developing *persistent* antisocial behaviour, and for whom intervention may be beneficial, at quite a young age.

While some may perceive temperamental characteristics to be 'fixed', and as a consequence, not amenable to intervention, research indicates that such characteristics are moderately stable over childhood and thus not immutable (Sanson, Hemphill and Smart 2002). Furthermore, temperament's impact on a child's development depends largely on its "fit" with the environment. Hence, in striving to optimise a child's development, attempts should be made to maximise the "fit" between the child and his/her environment, matching parenting and educational practices to the characteristics of the child, and helping the child to develop strategies to best manage his/her temperamental and behavioural tendencies.

4. Interventions targeting experimental antisocial behaviour need to be multi-faceted and focus on the early secondary school years

It was not until the early secondary school years that the *experimental* group could be differentiated from the *low/non antisocial* group. At this time, the *experimental* group became increasingly similar to the *persistent* group, exhibiting more behaviour problems, more school adjustment difficulties, experiencing poorer quality parenting, and associating more frequently with antisocial peers. However, towards the end of adolescence, these individuals appeared to be desisting in their antisocial behaviour, becoming more similar to the *low/non antisocial* group again.

Adolescence can be a time of "stress and storm" for some, which is later outgrown. It could be argued that it is more important to focus on those who display *persistent* antisocial behaviour than those who "test the waters". However, recent findings from the Dunedin Multidisciplinary Health and Development Study (Moffitt, Caspi, Harrington and Milne 2002) show that individuals who engage in transitory "adolescent-limited" antisocial behaviour have poorer outcomes (for example, mental health problems, substance dependence, financial problems, engagement in property offences) at age 26 than those who do not engage in teenage antisocial behaviour. Furthermore, while the behaviour of the *experimental* group may be transitory, it does result in considerable personal, social and economic cost to families, schools and the wider community. Given these findings, attempts to prevent the development of *experimental* antisocial behaviour would appear valuable.

The current findings suggest that the period following the transition to secondary school, in which the first differences between the *experimental* and *low/non antisocial* groups were evident, would be the appropriate age to target early intervention and prevention efforts for *experimental* antisocial behaviour. The constellation of characteristics which appear to identify a young person at risk for such behaviour include: a distinct change in behaviour from no particular problems in childhood to acting out, oppositional, uncooperative behaviour in the early teenage years, growing alienation from and difficulties at home and school, and the development of friendships with peers who engage in antisocial activities in the early-to-mid adolescent years.

As the *experimental* group appeared to exhibit a wide range of difficulties in many of the same domains as the *persistent* group, broad intervention programs targeting similar aspects of functioning to those earlier outlined in relation to the *persistent* group (for example, behavioural, skills-focused) would appear appropriate. Indeed, research suggests that community-based programs that focus on a range of styles and modes of treatment (for example, cognitive and behavioural) are effective in reducing recidivism in antisocial youths whereas deterrence programs (for example, involving "shock incarceration", and "scared-straight" techniques) have been found to produce negative effects (Greenwood et al. 1998).

5. Predictors of antisocial behaviour are similar for males and females

Predictors of antisocial behaviour were generally similar for males and females. Few other studies have investigated this issue (as the majority have focused on males) and even fewer studies have had the data from infancy necessary to examine differences in the timing of development of antisocial behaviour among males and females. When group differences were examined separately for males and females, differences generally emerged at the same times and in the same domains for both sexes. These findings are consistent with those of Moffitt and colleagues (2001) who observed that the same risk factors predicted later antisocial behaviour for both males and females in a sample of 956 New Zealand children. Taken together, these findings suggest that interventions aimed at preventing the development of antisocial behaviour may be used equally well with males and females.

6. The role of family environment

Although those in the *persistent* and *experimental* groups were less likely to belong to an intact family by late adolescence, in general, there were few significant differences between the three groups on family sociodemographic characteristics (for example, family socioeconomic status, parental education, occupation, ethnic background, and number of children in the family). There is considerable debate in the literature regarding how such factors impact on individuals' propensity to engage in antisocial acts. For example, the classical view suggests that sociodemographic characteristics such as poverty and unemployment directly impact on antisocial behaviour by motivating an individual to offend. However, more recent research suggest that sociodemographic characteristics exert their effects on antisocial behaviour in a more indirect manner, for instance, by interfering with parents' ability to appropriately discipline and/or nuture their children (Barrera et al., 2002; Scaramella, Conger, Spoth, and Simons 2002; Weatherburn and Lind 1998). The findings from the current study lend support to the latter view.

Significant group differences were observed on many aspects of the family environment often cited as important to the prediction of antisocial behaviour. For example, individuals in the *experimental* and *persistent* group reported lower attachment to parents, and poorer quality parenting (for example, less supervision of the adolescents' activities, less warmth in their relationships with their parents) than those in the *low/non antisocial* group. Similarly, parents of individuals in the *persistent* group perceived their children to be less easy to get along with than parents of children in the *low/non antisocial* group and also reported the family unit to be less cohesive and close.

These findings suggest that the quality of parenting a child/teenager receives, and their relationships with parents, may impact on their engagement in antisocial behaviour. While these differences were not as strong as those observed for individual characteristics, school adjustment and peer relationships (typically falling within the small effect size range), they were of a similar, if not larger, magnitude to those observed in many previous studies.

7. Peer relationships and their influence

While the groups did not differ in the quality of their friendships, the *low/non antisocial* group members were more attached to their peers and more frequently interacted with them in a structured setting (for example, while playing sport). The two antisocial groups, on the other hand, appeared to spend more time with peers, but their time together was more likely to be unstructured. The existence of friendships with other antisocial youth was one of the most powerful factors differentiating the antisocial and low/no groups. These findings are consistent with a large body of research which suggests that associating with antisocial peers is one of the most powerful risk factors for adolescent antisocial behaviour.

8. The importance of school adjustment

Unlike previous research, the present study did not find school achievement (as assessed by a reading test at 7-8 years and teacher ratings of academic competence at 7-8 and 11-12 years) during the primary school years to be predictive of later antisocial behaviour. However, from the beginning of secondary school clear differences in participants' levels of school adjustment (for example, ability to manage school rules/routines, understanding the work taught in class) and attitudes to schooling (for example, perceived long-term relevance, relationship with teachers, confidence in own ability) were evident. A closer examination of the individual questions that made up the elementary school adjustment and achievement measures revealed a similar pattern of findings, with some group differences being observed on items relating to school adjustment (for example, ability to follow instructions, relationships with teachers, classroom behaviour, motivation etc) rather than items pertaining to school achievement. Hence, the current findings suggest that school adjustment (both how an individual adjusts to the routines and demands of school-life and how the school accommodates the child's characteristics and needs) and school attachment (his/her attitudes and attachment to school) are of greatest salience for the development of adolescent antisocial behaviour.

In summary, this report has documented substantial group differences between adolescents who engage in high levels of antisocial behaviour and those who do not, which are evident from the early primary school years on, and increase in strength and diversity over time. The most powerful group differences emerge in individual characteristics such as temperament, behaviour problems, social competance, levels of risk-taking behaviour and coping skills, and in the domains of school adjustment and peer relationships. Significant group differences were also found on aspects of the family environment. These findings have important implications for understanding the etiology of antisocial behaviour, and for the content and timing of interventions aimed at preventing the development of this type of behaviour.

7 Next phase of this research

This report by no means provides an exhaustive overview of the nature, prevalence, and development of antisocial behaviour among participants of the Australian Temperament Project. Over the coming months, the project team will be engaging in a number of tasks in an endeavour to better understand the development of antisocial behaviour in this sample.

These tasks include:

- An examination of differences between individuals who engage in violent antisocial behaviours and those who engage in non-violent antisocial acts.
- An investigation of factors which may protect against the development of adolescent antisocial behaviour among those with many risk factors.
- The collection of further self-report data from participants (who will be 19-20 years of age in 2002) concerning their engagement in antisocial acts, contact with the criminal justice system, experiences of being a victim of crime, and their perceptions of the fairness of the criminal justice system.
- The analysis of data concerning the nature and prevalence of different crimes by community area to examine neighbourhood effects on antisocial behaviour.

In completing these tasks we hope to gain a better understanding of the factors that contribute to, and protect against, the development of antisocial behaviour in young people in Australia.

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