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The Australian Institute of Family Studies is Australia's national centre for research and information on families. Now in its twenty-third year, the Institute's research on issues that affect family stability and wellbeing play a key role in the development of family policy and informed debate in Australia. The Institute is a statutory authority established by the Commonwealth Government in February 1980.

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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

TYPES, RESILIENCY AND ENVIRONMENTAL INFLUENCES



THE SECOND REPORT OCTOBER 2003

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AUSTRALIAN TEMPERAMENT PROJECT

*A study of development from infancy to adulthood*



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# Foreword



Our understanding of adolescent antisocial behaviour has been substantially increased by the publication of this Second Report of the *Patterns and Precursors of Adolescent Antisocial Behaviour*. From the very productive collaborative partnership between the Australian Institute of Family Studies and Crime Prevention Victoria, we have further comprehensive research investigating important questions which lie at the heart of antisocial behaviour.

Through this longitudinal community study on Victorian children who are now entering adulthood - the *Australian Temperament Project* (in its twenty-first year) - we are confirming that young people's antisocial behaviour can take many forms. We are also discovering that it is common, and most optimistically, that it declines with age. Within the plethora of very interesting findings, there are clear messages for policy and program developers as well as for practitioners and for those who deliver services to children, young people and families.

The Second Report represents another landmark in the formation of a very strong Victorian evidence base to support the government's approach to crime prevention through early intervention strategies. As the research has convincingly shown, these interventions may be most effective at particular periods in the lives of children and adolescents. The research also points to whole of government and whole of community approaches where the efforts of families, teachers, police, friends and the community can all interact and be directed to protecting our children and young people from antisocial behaviour, which is so costly and can be so destructive.

The origins of many problems, including antisocial behaviour in adolescence and adulthood, can be traced back to early childhood. The Second Report makes a further 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 on to more positive pathways. In doing so, it adds to the evidence base for policy and practice regarding Australian children and their families.

Above all the Second Report carries a message of hope – that antisocial behaviour can be a passing phase which is outgrown. It is also encouraging that there are a substantial number of 'at risk' children who do not become persistently antisocial. Yet this also warns us to be cautious, and to avoid labelling children who appear to be 'at risk'. Sensitive interventions are required which recognise the reality of the multiple pathways to and from antisocial behaviour.

I strongly commend the Second Report of *Patterns and Precursors of Adolescent Antisocial Behaviour* and am confident it will be of great interest and a source of evidence 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 continue to facilitate government and community efforts to ensure the very best outcomes for all our children and their families.

André Haermeyer  
Minister for Police and Emergency Services

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**We would also like to sincerely thank the parents, young people and teachers who have participated in the Australian Temperament Project.**

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# *Preface*

This report on the patterns and pathways to antisocial and criminal behaviours among Australian adolescents is the second in a series of publications arising from a very productive collaboration between the Australian Institute of Family Studies and Crime Prevention Victoria.

The collaboration involves analysis of data from the Australian Temperament Project, a longitudinal study of a representative community sample of over 2400 children and families living in urban and rural areas of Victoria. The Australian Temperament Project is now in its twenty-first year and has been led by a multidisciplinary team of researchers from the Royal Children's Hospital, the University of Melbourne, La Trobe University and elsewhere. Since 2000, the Project has been housed at the Australian Institute of Family Studies.

The study contains a very rich data set on many aspects of the children's lives and their family and school experiences, collected over 13 survey waves. The longitudinal nature of the study allows the identification of a number of outcomes in adolescence and young adulthood. The collaboration between the Institute and Crime Prevention Victoria began in 2001 and in broad terms seeks to exploit this unique data set to increase understanding of the aetiology of adolescent antisocial behaviour, with a view to providing evidence for prevention and early intervention efforts.

The First Report, published in 2002, presented findings on across-time trends in adolescent antisocial behaviour, and the precursors of persistent and experimental patterns of such behaviour. The Second Report extends those findings substantially, highlighting the diversity and complexity of paths to adolescent antisocial behaviour.

In particular, the Report delineates the important distinction between violent and non-violent adolescent antisocial behaviour, the paths away from risk to resiliency for a substantial portion of the sample, the influence of the broader social environment, and the declining trend in rates of antisocial behaviour as the participants reach adulthood.

The findings emphasise the importance of avoiding 'one size fits all' proscriptions, at the same time as pointing towards the most opportune ages for intervention and identifying some of the critical factors which need to be considered.

I am confident that the new insights provided by this Second Report will be of great interest to policy makers and the research community, as well as to parents, teachers and other professionals who work with children and families. I hope its findings will be utilised in policy and practice to promote children's healthy development and wellbeing.

Ann Sanson  
Acting Director  
Australian Institute of Family Studies

# Executive summary

This is the Second Report from the collaborative partnership between the Australian Institute of Family Studies and Crime Prevention Victoria examining the development of antisocial behaviour within a representative sample of Victorian adolescents. The research draws upon data collected as part of the Australian Temperament Project.

This longitudinal community study has followed the development and wellbeing of a group of Victorian children from infancy to young adulthood. The initial sample comprised 2443 infants (aged 4-8 months) and their parents, who were representative of the Victorian population. Thirteen waves of data have been collected, via annual or biennial mail surveys. Parents, teachers and the young people themselves have completed questionnaires at various stages during the project.

The Second Report focuses on four specific issues related to adolescent antisocial behaviour:

- 1) Are the precursors and pathways for violent and non-violent adolescent antisocial behaviour similar or different?
- 2) What factors or characteristics prevent 'at-risk' children from engaging in later adolescent antisocial behaviour?
- 3) Do the characteristics of local areas influence engagement in adolescent antisocial behaviour, and if so, how?
- 4) How common is antisocial behaviour at 19-20 years of age and does the nature and frequency of antisocial acts change over the adolescent years?

## Precursors of violent and non-violent adolescent antisocial behaviour

The broad question explored was: to what extent are the pathways and precursors similar for violent and non-violent adolescent antisocial behaviour, and do the risks for each type of behaviour emerge at similar or different ages?

Three groups of 17-18 year old antisocial adolescents were identified:

- (i) a primarily violent group ('*Violent-Only*', n = 40, 65 per cent male),
- (ii) a primarily non-violent group ('*Non-Violent-Only*', n = 80, 54 per cent male),
- (iii) a group who engaged in high levels of both types of antisocial behaviour ('*Dual-Problem*', n = 34, 85 per cent male).

These groups were compared to a '*Comparison*' non-antisocial group (n = 1048, 42 per cent male) to: a) identify the age (or stage of development) at which each group began to differ from a 'normal' developmental pathway, and b) to explore the pattern of risks displayed by each group. The *Non-Violent-Only* antisocial group was also compared to the two violent antisocial groups (*Violent-Only*, *Dual Problem*) to further understand how similar or different the risks were for violent and non-violent antisocial behaviour. The most notable findings are:

### 1. Several developmental pathways were found

The three antisocial groups began to diverge from the 'normal' developmental pathway of the *Comparison* group at different ages. The *Dual Problem* antisocial group was first noticeably different in early childhood, the *Non-Violent-Only* antisocial group was consistently different from mid- to late- childhood, and the *Violent-Only* antisocial group in adolescence. These findings have implications for crime prevention strategies, particularly in deciding upon the optimal times for early intervention and prevention efforts directed at differing types of antisocial behaviour.

### 2. There were specific precursors for violent and non-violent adolescent antisocial behaviour

All three antisocial groups were more problematic than the *Comparison* group on a range of characteristics, although as noted previously, difficulties tended to emerge at different ages in each group. Precursors common to all three antisocial groups were aggression, difficulties in persevering with tasks and activities, school adjustment difficulties, and lower social skills. Strategies aimed at improving these types of skills and attributes have the potential to benefit the majority of young people who engage in antisocial behaviour, regardless of whether they are prone to violent or non-violent behaviour.

There were also some aspects on which the two violent antisocial groups, but not the *Non-Violent-Only* antisocial group, were problematic. Both violent groups (*Violent-Only*, *Dual Problem*) were more attracted to sensation seeking, were more 'reactive' (were more volatile and had difficulties controlling emotions), and experienced more difficulties in interpersonal relationships than the *Non-Violent-Only* group. Furthermore, some precursors were specific to the *Dual Problem* group only, such as a less advantaged family environment, parental perception of the child as 'difficult', and early language delay in one-in-five individuals.

3. *Violent adolescents were a diverse group*

Adolescents involved only in violent antisocial behaviour were rather different from those who engaged in both violent and non-violent antisocial behaviour. Problems among the *Dual Problem* group were evident from early in life while problems among the *Violent-Only* group tended to emerge in adolescence. Many risks were common to both groups, such as aggression, a volatile temperament style, low perseverance, less optimal parenting, and friendships with antisocial youth. However, some specific risks were also found, such as delayed language development, hyperactivity, parent-child relationship difficulties and a less advantaged family environment among the *Dual Problem* group; and anxiety and poor peer relationships among the *Violent-Only* group.

4. *The Dual Problem group was much more problematic than the Violent-Only and Non-Violent antisocial groups*

The *Dual Problem* group was much more problematic than the two single problem antisocial groups, with higher rates of difficulties on a wider range of characteristics and from earlier in life. These findings highlight the importance of providing intervention and assistance for susceptible young people and their families, such as those in the *Dual Problem* group, before problems become entrenched. The most appropriate time for this group appears to be in the pre-school years, as these children tended to display numerous and enduring difficulties from the primary school years onwards.

## **Resilience from adolescent antisocial behaviour: The role of personal attributes and the family, peer and school environment**

While there has been much research into risk factors for, and precursors of, adolescent antisocial behaviour, much less is known about the factors and processes that protect vulnerable young people from engaging in such behaviour. To determine the role of individual, family, school and peer factors in promoting resilience, two groups of children who were 'at-risk' at 11-12 years were compared. Individuals were classed as being 'at-risk' if they possessed three or more individual characteristics identified by the current study and other research as risk factors for persistent adolescent antisocial behaviour, such as aggression, lower social skills, or a difficult temperament style.

The groups were:

- (i) an 'at-risk' group who engaged in little or no subsequent antisocial behaviour (*Resilient* group, consisting of a random sample of 100 of the 286 children identified as 'high risk' who were not subsequently antisocial, 60 per cent male),
- (ii) an 'at-risk' group who were persistently antisocial during adolescence i.e. engaged in high levels of antisocial behaviour at two or more timepoints (*Antisocial* group,  $n = 78$ , 72 per cent male).

Both groups were compared to a third, low risk group who comprised the remainder of the sample, to provide a normative comparison (*Comparison* group,  $n = 1108$ , 48 per cent male).

The aim was to a) describe the developmental pathways of these three groups, b) to identify changes in pathways, and c) to determine whether there were personal and/or environmental characteristics that consistently differentiated the *Resilient* from the *Antisocial* group, which may have provided protection from a progression to persistent adolescent antisocial behaviour. The key findings arising from the research are:

1. *Developmental pathways can change over late childhood and early adolescence, so intervention may still be successful at this age*

The 'at-risk' *Resilient* and *Antisocial* groups were similar to each other, and more problematic than the *Comparison* group, on a wide range of characteristics during toddlerhood and childhood. However, there was a marked change in the *Resilient* group over the early adolescent years that continued throughout adolescence. This improvement was so large that by the age of 17-18 years, the *Resilient* group resembled the *Comparison* group on many attributes and characteristics.

This finding has important implications for intervention strategies aimed at preventing adolescent antisocial behaviour as it suggests that individuals who may be 'at risk' for adolescent antisocial behaviour are still amenable to change during late childhood and early adolescence.

2. *The early adolescent years appear to be a crucial transition point in pathways to adolescent antisocial behaviour*

Between the ages of 12-13 and 13-14 years, clear differences between the 'at-risk' *Resilient* and *Antisocial* groups began to emerge. While our study cannot fully explain this trend, it is possible that factors associated with the transition from primary to secondary school, and/or developmental changes associated with the onset on puberty and the progression to adolescence, may have played a substantial role.

3. *Changes in temperament and their impact*

Temperamental characteristics are sometimes viewed as permanent, and not easily changed. While the two 'at-risk' groups were consistently rated as more volatile and less able to maintain attention on tasks than the *Comparison* group during childhood, there was a marked improvement among the *Resilient* group on these characteristics over adolescence. The *Resilient* group had also developed better management and control of their emotions by late adolescence. These findings suggest that individuals who display 'difficult' temperamental characteristics during childhood can develop and mature, and can be supported in managing or moderating these traits, so that they do not become 'problem' adolescents.

4. *The potent role of peer relationships in preventing the development of persistent adolescent antisocial behaviour*

Peer relationships were found to play a very important role. Prior to adolescence, the only characteristic that differentiated the 'at-risk' *Antisocial* group from the 'at-risk' *Resilient* group was their tendency to have formed friendships with peers who engaged in antisocial activities. Since this difference was evident before the group trajectories began to diverge, it is possible that the *Resilient* group's lower involvement with antisocial peers may have protected them from later developing persistent antisocial behaviour.

Some other, less expected, peer-related characteristics were also associated with resilience against antisocial behaviour for 'at risk' adolescents, such as lower peer involvement, less positive peer relationships, and lower assertiveness. It is possible that the more reserved personal style of the *Resilient* group may have impeded and protected them from a progression to more serious and long-term behaviour problems.

5. *The importance of parenting and the family environment*

Parents of 'at-risk' *Resilient* children consistently reported supervising their children's activities to a much higher extent than parents of 'at-risk' *Antisocial* children, and reported an improvement in their relationship with their child over the adolescent years. Furthermore, *Resilient* children were more likely to belong to an 'intact' family unit and their parents reported a more optimal family environment (a higher sense of family unity, lower levels of marital conflict and lower levels of family stress) than parents of *Antisocial* children.

While it is difficult to determine whether these differences (e.g. higher parental supervision, more positive parent-child relationship) contributed to the improvement in the *Resilient* group, or occurred as a result of it, interventions aimed at improving relationships between 'at-risk' children and their parents, and assisting parents to develop more effective parenting skills, would appear highly worthwhile.

6. *The powerful influence of school attachment and achievement*

The 'at-risk' *Resilient* group experienced fewer school adjustment difficulties than the 'at-risk' *Antisocial* group over the secondary school years, and *Resilient* adolescents reported feeling more attached to school, and had more positive attitudes to schooling than those in the *Antisocial* group. These findings highlight the positive role that schools can play in promoting the psychosocial development of young people.

7. *Pathways to adolescent antisocial behaviour are diverse and complex*

Importantly, most children identified as being 'at-risk' of developing persistent adolescent antisocial behaviour did not go on to become persistently antisocial. It was also noteworthy that approximately a third of individuals who engaged in persistent antisocial behaviour during adolescence had not been identified as 'at-risk' at 11-12 years.

These findings suggest that there are a number of pathways to adolescent antisocial behaviour, and that a wide range of personal and environmental factors may influence an individual's progression along particular pathways. More research is needed to further specify the mechanisms and processes which facilitate or impede the development of adolescent antisocial behaviour.

## Location Effects on Adolescent Antisocial Behaviour

It has been suggested that local area or community characteristics, such as poverty and high unemployment, may directly impact on adolescent antisocial behaviour by motivating an individual to offend. An alternative view is that characteristics such as socio-economic disadvantage may impact on antisocial behaviour more indirectly; for instance, by interfering with parents' ability to appropriately discipline, supervise or nurture their children. The relationship between locality characteristics and rates of adolescent antisocial behaviour as measured by self reports was explored, as was the question of whether these characteristics exerted an impact directly or indirectly.

Location effects were measured in terms of Victorian local government area (LGA) characteristics. The location characteristics included were: unemployment rates, average weekly income, recorded crime rates, growth rates, proportion of lone-parent families, relative socio-economic disadvantage, economic resources, education and occupation, and metropolitan-regional-rural location. The frequency of *Persistent*, *Experimental* and *Low/non* antisocial behaviour among adolescents in disadvantaged, and non-disadvantaged, localities was investigated. The findings from this investigation are:

### 1. No direct locality effects were found

Rates of *Persistent*, *Experimental* and *Low/non* antisocial behaviour were similar among adolescents living in disadvantaged areas (LGAs that were ranked among the most problematic 20 per cent in the state on a characteristic) by comparison with those living in less disadvantaged areas. A 'total disadvantage index' was developed (the sum of the number of disadvantaged characteristics), and again, self-reported rates of antisocial behaviour were not significantly higher among those from more disadvantaged localities. Rates of adolescent antisocial behaviour were similar across metropolitan, regional or rural locations. Similarly, local area characteristics were generally not related to adolescents' contact with the criminal justice system.

### 2. No indirect locality effects were found

The local area characteristics included in the analyses (socio-economic disadvantage and high recorded crime rates) did not appear to have an indirect effect on antisocial behaviour. That is, living in a disadvantaged or high crime area did not appear to interact with characteristics of the peer and family environment (a non-intact family unit, low levels of parental supervision, or frequent association with antisocial peers) to increase the likelihood that an individual would engage in persistent adolescent antisocial behaviour.

These findings suggest that local area characteristics had little association with self-reported adolescent antisocial behaviour. However, some qualifications are necessary. Even with the relatively large sample used in the analyses ( $n = 970$ ), only a small number of individuals were found to have several of the characteristics investigated (disadvantaged locality, non-intact family, low parental supervision, antisocial peer friendships). Thus a comprehensive investigation of indirect effects was not possible. Additionally, the measure of location used (LGA) may have been too broad to detect area differences. Future research into this issue would appear worthwhile.

## Patterns of antisocial behaviour and substance use at 19-20 years of age

Research has shown that rates of antisocial behaviour tend to be highest in mid-adolescence and then decline with age. The question of whether antisocial behaviour declined further after the completion of secondary school and the transition to adult life was investigated. Patterns of antisocial behaviour at 19-20 years of age were explored, and compared to the trends found at earlier ages. The key findings are:

### 1. Levels of antisocial behaviour and substance use at 19-20 years

As part of the thirteenth data collection wave, at 19-20 years of age, participants were asked about their engagement in antisocial behaviour over the past year (or month for substance use). The most frequent type of behaviour, by far, was alcohol consumption (89 per cent had consumed alcohol within the past month), and tobacco and marijuana use (38 per cent and 22 per cent respectively). Few reported using illicit drugs such as heroin or ecstasy (approximately 1 per cent).

Common antisocial acts were: being drunk in a public place (two-thirds of young people), and avoiding payment for services (38 per cent). Violent and property acts were less common, with the most frequent types being involvement in a physical fight (16 per cent) and damaging property (13 per cent). Just over 20 per cent had been in contact with the police for driving offences during the past 12 months, but only 5 per cent had been in contact with the police for other types of offences.

Overall, engagement in antisocial behaviour was relatively common, with 46 per cent reporting having committed one or more types of antisocial acts during the past year. However, most young people were involved in a small number and range of antisocial acts. For most types of behaviour, very few engaged in the behaviour on more than one occasion. Only 15 per cent engaged in high levels of antisocial behaviour (involvement in three or more different types of antisocial behaviour).

- 2. Comparison of antisocial behaviour and substance use among males and females aged 19-20 years*  
Substance use was common across both sexes. Similar proportions of males and females had consumed alcohol, smoked cigarettes and been drunk in a public place. Rates of evading paying for services were also similar among young men and women. There were also several gender differences.

**For males**, involvement in physical fights was relatively common (one-in-four), while one-in-five reported engaging in property damage. A relatively high proportion of males had been in contact with the police for driving offences (32 per cent), engaged in computer-related antisocial acts (8-13 per cent), the buying or selling of stolen goods (14 per cent), and shoplifting (12 per cent). Between 5 and 10 per cent reported selling illegal drugs, carrying a weapon, stealing from a house, police contact for non-driving offences, and being charged by police.

**For females**, a relatively high number reported police contact for driving offences (13 per cent), while rates of physical fights, shoplifting, buying or selling stolen goods, and damaging property were between 6 and 9 per cent.

- 3. Across-time patterns of antisocial behaviour and substance use from early adolescence to adulthood*  
Comparison of the rates of antisocial acts at 19-20 years with rates of antisocial behaviour at earlier time points (13-14, 15-16 and 17-18 years) revealed that the frequency of most property and violent acts continued to decrease from a peak at 15-16 years. However, engagement in selling illegal drugs, shoplifting and substance use at 19-20 years remained at similar levels to that at 17-18 years of age.

The number engaging in high levels of antisocial behaviour (three or more different types of antisocial behaviour in the past year) also declined. At 19-20 years, 15 per cent had engaged in 3 or more different antisocial acts, by comparison with 20 per cent at 15-16 and 17-18 years, and 12 per cent at 13-14 years.

In summary, while almost half the young people had been involved in some antisocial behaviour at 19-20 years, the overall sample's rate of engagement in most types of antisocial acts was very low, and fewer than one in five individuals had frequently engaged in high levels of antisocial behaviour. The across-time trends revealed that rates of many types of antisocial behaviour continued to decline from a peak at mid adolescence, while substance use increased steadily until late adolescence and remained constant from that time.

## Conclusions

The findings of this Second Report build upon those from the First Report to increase our understanding of the development of antisocial behaviour among a community sample of young Victorians. Distinct developmental pathways and risks for violent and non-violent adolescent antisocial behaviour were identified. A range of personal and environmental factors were shown to influence an individual's progression along particular pathways, and to divert 'at risk' children from a problematic pathway. Effects of local area characteristics on involvement in adolescent antisocial behaviour were not found, but the study's ability to investigate this issue was somewhat limited. In terms of trends across time, rates of most types of antisocial behaviour continued to decline as the young men and women entered adulthood, although some remained relatively high. Overall, the findings of the First and Second Reports provide valuable insights into the development and continuation of adolescent antisocial behaviour, and provide significant Victorian evidence for early intervention and prevention strategies.

# 1 Introduction

This is the Second Report in the series *Patterns and Precursors of Adolescent Antisocial Behaviour*, examining the development of antisocial behaviour within a representative community sample of Victorian adolescents. It is the product of the collaborative partnership between the Australian Institute of Family Studies and Crime Prevention Victoria, which began in 2001 when Crime Prevention Victoria commissioned the Institute to collect and analyse data as part of the Australian Temperament Project concerning the development of adolescent and young adult antisocial behaviour. The findings emerging from the project provide a knowledge base which can inform and guide early intervention and prevention strategies.

The Australian Temperament Project (ATP) is a large scale, longitudinal study which has followed the development and adjustment of a cohort of Victorian children from infancy to young adulthood, with the aim of tracing the pathways to psychosocial adjustment and maladjustment across the children's lifespan (Prior, Sanson, Smart, & Oberklaid, 2000). The initial sample comprised 2443 infants (aged 4-8 months) and their parents, who were representative of the Victorian population. In total, thirteen waves of data have been collected, via annual or biennial mail surveys. Parents, teachers and the young people themselves have acted as informants at various stages during the project.

The First Report from this collaborative project, *Patterns and precursors of adolescent antisocial behaviour* (Vassallo, Smart, Sanson, Dussuyer, McKendry, Toumbourou, Prior & Oberklaid, 2002), examined the nature and extent of antisocial behaviour among participating adolescents; identified different patterns of antisocial behaviour; and identified precursors of this type of behaviour. In brief, the First Report found that antisocial behaviour was quite common between the ages of 13 and 18 years. For example, at 13-14 years, one in three adolescents 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. Additionally, a number of distinct patterns of antisocial behaviour were identified. These included a *Low/non antisocial* pattern (little or no antisocial behaviour between the ages of 13 and 18 years), an *Experimental* pattern (high levels of antisocial behaviour during early- to mid-adolescence only), and a *Persistent* pattern (high levels of antisocial behaviour throughout adolescence).

A wide range of precursors of *persistent* adolescent antisocial behaviour were found. Significant differences between the *Persistent* antisocial group and the *Low/non* antisocial group were evident from the early primary school years on, and increased in strength and diversity over time. The most powerful group differences emerged 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. Risk factors for *Experimental* adolescent antisocial behaviour were identifiable from the early secondary school years onwards, and were similar, but generally less powerful, than those identified for *Persistent* antisocial behaviour.

Following on from the First Report, this Second Report focuses on four specific issues related to adolescent antisocial behaviour, which will further increase understanding of the pathways and precursors of such behaviour, and will provide Victorian evidence which can inform early intervention and prevention approaches.

The research questions investigated are:

1. Are the risks and pathways for violent and non-violent adolescent antisocial behaviour similar or different?
2. What factors or characteristics protect 'at-risk' children from engaging in later antisocial behaviour?
3. Do the characteristics of local areas influence engagement in antisocial behaviour, and if so, how?
4. How common is antisocial behaviour at 19-20 years of age and have the nature and frequency of antisocial acts changed over the adolescent years?

The next three sections draw upon information collected within the first twelve data collection waves of the study (when participants were aged between 4-8 months and 17-18 years), whilst the fourth section uses data from the most recent data collection wave in the year 2002 (at the age of 19-20 years).

## 2 *Precursors of violent and non-violent adolescent antisocial behaviour*

Adolescent antisocial behaviour includes a diverse set of behaviours, ranging from relatively minor to quite serious acts. It includes criminal acts such as theft or the selling of illicit drugs, and dysfunctional behaviours<sup>1</sup> such as running away from home or skipping school. It also includes violent acts such as fighting and attacking another person with the intent to harm, and non-violent antisocial acts such as stealing or graffiti drawing.

In the First Report, *Patterns and precursors of adolescent antisocial behaviour* (Vassallo et al., 2002), the patterns and frequency of adolescent antisocial behaviour among participants in the Australian Temperament Project study were described. There was considerable diversity in the types of antisocial behaviours engaged in by adolescents. The report (Vassallo et al., 2002) also described the precursors of persistent and transitory patterns of adolescent antisocial behaviour and showed there were substantial across-time differences in the type and timing of risk factors for these two patterns of antisocial behaviour.

An important research question, which is taken up in this Second Report, is the identification of sub-groups of antisocial youth, and specifically in this section, violent and non-violent individuals. The broad question addressed is - to what extent are the pathways and precursors similar for violent and non-violent antisocial behaviour, and do the precursors emerge at the same developmental stages?

### **Research into violent and non-violent offending**

Moving from a broad focus on adolescent antisocial behaviour, researchers have recently sought to distinguish between different types, such as physical aggression and violence on the one hand, and non-violent acts, such as theft and property offences on the other. Loeber and Hay's model (1994), which proposes that three developmental sequences lead to differing antisocial outcomes has provided an impetus for such research. The three pathways described by the model are:

- an *overt pathway* from minor aggression and fighting to physical aggression and violence;
- a *covert pathway* from lying and stealing to more serious delinquent acts such as fraud, burglary and theft; and
- an *authority conflict pathway* from stubbornness and disobedience to authority avoidance transgressions such as truancy and running away from home.

The delineation of these three distinct pathways carries implications for prevention and intervention, suggesting that differing strategies may be needed for each type of antisocial behaviour. Loeber and Hay (1994) also note that children may be on multiple pathways, or move from one pathway to another. The existence of the three pathways has been supported by several recent studies (e.g. Nagin & Tremblay, 1999; Tolan & Gorman-Smith, 1998).

Other research suggests that violent adolescents are a small sub-group, who can be distinguished from the larger group who engage in non-violent adolescent antisocial behaviour (Farrington & Loeber 2000a; Loeber, Farrington, Rumsey, Kerr & Allen-Hagan 1998; Maughan, Pickles, Rowe, Costello & Angold 2000; Nagin & Tremblay, 1999).

An extensive 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 differences between violent and non-violent offenders. These included the findings that violent offenders are typically male, tend to start offending earlier and continue offending longer than non-violent offenders, and also tend to exhibit other problem behaviours (for example, substance use, mental health difficulties, authority conflict problems).

Further support for a differentiation between violent and non-violent offenders comes from research investigating 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 1,419 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 & Tremblay 1999) 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

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<sup>1</sup> 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)

groups is more a matter of degree than type, in which case risk factors for the two types of antisocial behaviour should be similar. 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 and 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 higher on the measure of intelligence.

Similarly, Capaldi and Patterson (1996) found that young people arrested for violent offences had similar backgrounds to youth who had frequently been arrested for non-violent offences, although the possibility that the non-violent youth had committed undetected violent offences could not be ruled out. Henry, Caspi, Moffitt and Silva (1996) reported that the same family structural risk factors predicted violent and non-violent convictions in late adolescence. However these researchers found that lack of control in early childhood was predictive of a violent outcome only, suggesting a specific connection between this characteristic and physical aggression.

Thus the question of whether the precursors of, and developmental pathways to, violent and non-violent adolescent antisocial behaviour are different remains unresolved, and further investigation is warranted. This issue is of considerable significance for crime prevention strategy development, particularly the timing and nature of interventions. One problem with much previous research is that the 'violent' group is a mixed one, containing some individuals who are predominantly aggressive and others who commit both violent and non-violent offenses. As Loeber and Stouthamer-Loeber (1998) have suggested, differentiating between these two violent sub-groups may reveal important developmental differences.

Another issue yet to be fully examined is whether the precursors of violent and non-violent propensities emerge at similar or different stages of children's development. For example, given the early emergence and high stability of aggressive behaviour (Farrington, 1994), it is possible that the risks for physically aggressive, violent behaviour might be identifiable at an earlier age than risks for non-violent outcomes.

The collaboration between Crime Prevention Victoria and the Australian Institute of Family Studies provides an opportunity to investigate these questions using the longitudinal Australian Temperament Project data set. Three groups of 17-18 year old antisocial adolescents are identified: a *primarily violent* group, a *primarily non-violent* group, and a group who engaged in *both types* of antisocial behaviour. These groups are compared to a non-antisocial Comparison group to identify the age/stage of development at which each group began to diverge from the 'normal' developmental pathway, and to describe the pattern of risks exhibited by each antisocial group. The groups are compared on a wide range of domains of functioning over a time span from toddlerhood to mid adolescence. The non-violent antisocial group was also compared to the two violent groups in an effort to further understand the commonality of risks for these different types of antisocial behaviours.

## Methodology

The context for the study is the Australian Temperament Project (ATP), a longitudinal community study of Australian children's development from infancy onwards (Prior, Sanson, Smart & Oberklaid, 2000). The project began in 1983 with the enrolment of a representative sample of over 2400 infants and families from urban and rural areas of the state of Victoria.

Families have been followed up thirteen times by mail surveys at 1-2 yearly intervals, beginning at 4 to 8 months of age and continuing through to 19-20 years. Approximately two-thirds of the original families are still participating in the study.

Although there is an over-representation of disadvantaged families and non-Australian born parents among those no longer participating in the study, the retained sample is very similar to the original sample on all child characteristics assessed at infancy and continues to include a broad range of families. At each time point, the response rates have been approximately 80 per cent of those remaining in the study and surveyed at that particular time point.

Parents, teachers, maternal and child health nurses, and the young people themselves have provided information about the child's development across a wide range of domains, including child temperament, emotional and behavioural adjustment, school progress, health, social competence, relationships with parents and peers, parents' child-rearing practices, and the family's structural characteristics and experience of stress.

The data on antisocial behaviour come from 1259 adolescents (581 boys and 678 girls) who completed questionnaires in the year 2000 at 17-18 years of age, which for most was the final year of secondary school. Antisocial behaviour was assessed using a short form of the Moffitt & Silva (1988) Self Report of Delinquency Scale. While the study thus rests upon self-report data, research has shown that such data are reasonably reliable (e.g. Huizinga & Elliott, 1986; Maxfield, Weiler & Widom, 2000).

Consistent with other research (e.g. Huizinga, 1995), the incidence of physical aggression and violence among ATP participants was found to decrease over the adolescent years, and by 17-18 years of age was relatively rare. The criteria developed to identify 'violent' individuals were designed to identify those who had displayed a propensity for violence over multiple occasions within the past 12 months, whose behaviour was very atypical and dysfunctional for this age-group. The criteria were also designed to exclude those for whom violence was a 'one-off' incident.

Thus, adolescents were identified as exhibiting *violent* antisocial behaviour if they reported at age 17-18 years:

- engaging in a physical fight on **three** or more occasions in the past year, or
- attacking someone with the intention of seriously harming them **two** or more times in the past year; or
- engaging in a physical fight **twice** in the past year and also bullying or threatening others on **several** occasions, or
- attacking someone with the intention of seriously harming them **once** in the past year and also bullying or threatening others on **several** occasions.

Adolescents were identified as exhibiting *non-violent* antisocial behaviour if they reported involvement in **three** or more of the following antisocial behaviours during the past twelve months:

- stealing something from a person or a house
- damaging something in a public place on purpose
- suspension/expulsion from school
- running away from home overnight or longer
- shoplifting
- graffiti in a public place
- driving a car without permission
- selling illegal drugs

Adolescents who fit the criteria for *violent* antisocial behaviour but did not fit the criteria for *non-violent* antisocial behaviour were placed in the '*Violent-Only*' group. Similarly, adolescents who fit the criteria for *non-violent* antisocial behaviour but did not fit the criteria for *violent* antisocial behaviour were placed in the '*Non-Violent-Only*' group. There were a small number of *non-violent* adolescents who did not fit the *violent* criteria but who had reported some aggressive behaviour during the past year (N = 11). These individuals were excluded as it was felt that they did not clearly fit the profile for the '*Non-Violent-Only*' group.

Adolescents who fulfilled the criteria for *violent and non-violent* antisocial behaviour were placed in the '*Dual Problem*' group, while adolescents who were below the criteria for *violent* and *non-violent* antisocial behaviour were placed in the '*Comparison*' group.

Thus, the following four groups were formed:

Comparison (non-antisocial)	1048 adolescents, 42 per cent male
Antisocial sub-groups:	
Violent-Only	40 adolescents, 65 per cent male
Non-Violent-Only	80 adolescents, 54 per cent male
Dual Problem	34 adolescents, 85 per cent male

The *Violent-Only* and *Dual Problem* groups did not differ in the frequency of physically aggressive, violent behaviour ( $t(72) = 1.14, p = .257$ ). The *Dual Problem* group had committed significantly more non-violent acts than had the *Non-Violent-Only* group ( $t(112) = 3.23, p < .003$ ). An examination of the items used to define non-violent antisocial behaviour revealed that *Dual Problem* group individuals had sold illegal drugs, driven a car without permission, and damaged something on purpose, significantly more often than *Non-Violent-Only* group individuals. While it is beyond the scope of our study to explain the higher rates of non-violent antisocial behaviour among the *Dual Problem* group, possible explanations are that violent acts may provide a setting in which the committing of non-violent acts may also occur (e.g. a non-violent act such as selling drugs might also result in violence), or the committing of violence may act as a 'disinhibitor', diluting the impact of social and moral norms and exacerbating antisocial tendencies.

Data from the earlier data waves (i.e. prior to 17-18 years) were used to investigate the precursors of violent and non-violent antisocial behaviour. Because of the wealth of data available, some consolidation across time points and also across sources of report was undertaken, standardising the original variables before forming composite variables. Following this data reduction, all independent variables were dichotomised, with the most problematic 25 per cent of the ATP cohort on a particular measure being deemed as showing difficulties on that characteristic<sup>2</sup>.

Although differences at infancy were investigated, the main focus is on four broad age periods: *toddlerhood and early childhood* (covering 1 - 4 years); *early to mid childhood* (across 5 - 8 years and corresponding to the first 3 years of primary school), *mid to late childhood* (across 9 - 12 years, covering the last three years of primary school), and *early to mid adolescence* (from 12 - 16 years, the first four years of secondary school). For the first three age periods (from toddlerhood to late childhood) data from 6 survey waves were used (two waves of data for each age period), while the oldest age period used data from three survey waves (over early to mid adolescence). The variables included are shown in Table 1 on page 5.

2 Farrington and Loeber (2000b) have shown that such dichotomisations can aid interpretability, accommodate non-normality, and do not necessarily reduce the strength of inter-relationships.

## Findings

Groups were compared using multinomial logistic regression<sup>3</sup>. The first set of analyses compared the *Comparison* group with each antisocial group in turn to investigate the timing and nature of risks for violent and non-violent antisocial behaviour. Variables on which statistical differences were found are displayed graphically in Figures 1 to 3c, except for the toddler period where few significant differences were found, and these are described rather than displayed.

The Figures show the rates of difficulties exhibited by the antisocial groups on the variables. It should be noted that the criterion used to dichotomise variables, which designated the most problematic 25 per cent of the ATP cohort as exhibiting difficulties, means that the baseline (i.e. 'normal') rate of difficulties among the ATP cohort is 25 per cent. This should be borne in mind when considering the rates of difficulties among the three antisocial groups. As an example, over 40 per cent of children in the *Dual Problem* antisocial group lived in a disadvantaged family environment, a rate considerably higher than the baseline rate of family disadvantage among the ATP sample, which was about 25 per cent. The 25 per cent criterion did not apply for a small number of variables, and these exceptions are noted below the Figures. Details of statistical analyses and the relative risk ratios can be found in Appendix 1.

Table 1	Variables used as potential risk factors for the development of <i>Violent-Only, Non-Violent-Only, and Dual Problem</i> adolescent antisocial behaviour	Source <sup>1</sup>
<b>Toddlerhood and early childhood</b>		
<b>1-3 years</b>		
■ Toddler aggression, temper tantrums and over-activity		P
■ 'Difficult' toddler temperament characteristics (uncooperativeness, irritability, reactivity, low persistence)		P
■ Parent perception of toddler as 'difficult'		P
■ Family low SES background (a composite of both parents' educational and occupational status)		P
<b>3-4 years</b>		
■ Child aggressive, hyperactive and anxious-fearful behaviour problems		P
■ Child 'difficult' temperament characteristics (reactivity, low persistence)		P
■ Child slow to talk		P
■ Child currently has language problems		P
■ Large family size (4 or more children)		P
■ Family low SES background		P
<b>Early to mid childhood</b> (averaged across data from 5-6 and 7-8 years)		
■ Child aggressive, hyperactive & anxious-fearful behaviour problems		P & T
■ Child 'difficult' temperament characteristics (reactivity, low persistence)		P & T
■ Child poor school achievement and adjustment		T
■ Child low social skills		T
■ Parent perception of child as 'difficult'		P
■ Family low SES background		P
■ Family experience of stress during the past 12 months		P
<b>Mid to late childhood</b> (averaged across data from 9-10 and 11-12 years)		
■ The same variables and domains as at early-mid childhood		P, T & C
■ Child depression		P, T & C
■ Child problematic peer relationships		P, T & C
■ Child low self-control and low cooperation social skills		P, T & C
■ Child antisocial peer affiliations		P
■ Poor parent-child relationship		C
<b>Early to mid adolescence</b> (averaged across data from 12-13, 13-14 and 15-16 years)		
■ The same variables and domains assessed previously		P & A
■ Adolescent sensation seeking		A
■ Adolescent multi substance use (three or more of cigarette, alcohol, marijuana, sniffing or hard drug use during past month)		A
■ Adolescent antisocial peer affiliations		A
■ Adolescent low attachment to peers and to family		A
■ Adolescent low quality peer relationships, and low participation in organised peer group activities (e.g. sports, community clubs)		P
■ Parenting style: low warmth of relationship, low use of inductive reasoning, harsh discipline, low monitoring		P
■ Divorce or death of a parent during the child's lifetime		P
<p>1 P = Parent report; T = Teacher report; C/A = Child/Adolescent report.</p>		

3 The two step approach recommended by Hosmer & Lemeshow (1989) was followed. Univariate analyses were used to identify variables which significantly differentiated between groups. The variables thus identified were subsequently included in multivariate analyses, which assessed each variable's contribution while simultaneously controlling for the effects of the other variables included.

## 1. Differences between the *Comparison* group and the *Violent-Only*, *Non-Violent-Only*, and *Dual Problem* antisocial groups

### *Infancy*

The sole significant group difference in infancy was between the *Dual Problem* group and the *Comparison* group on family socioeconomic background (SES), with the *Dual Problem* group more likely to live in a disadvantaged environment.

### *Toddlerhood and early childhood*

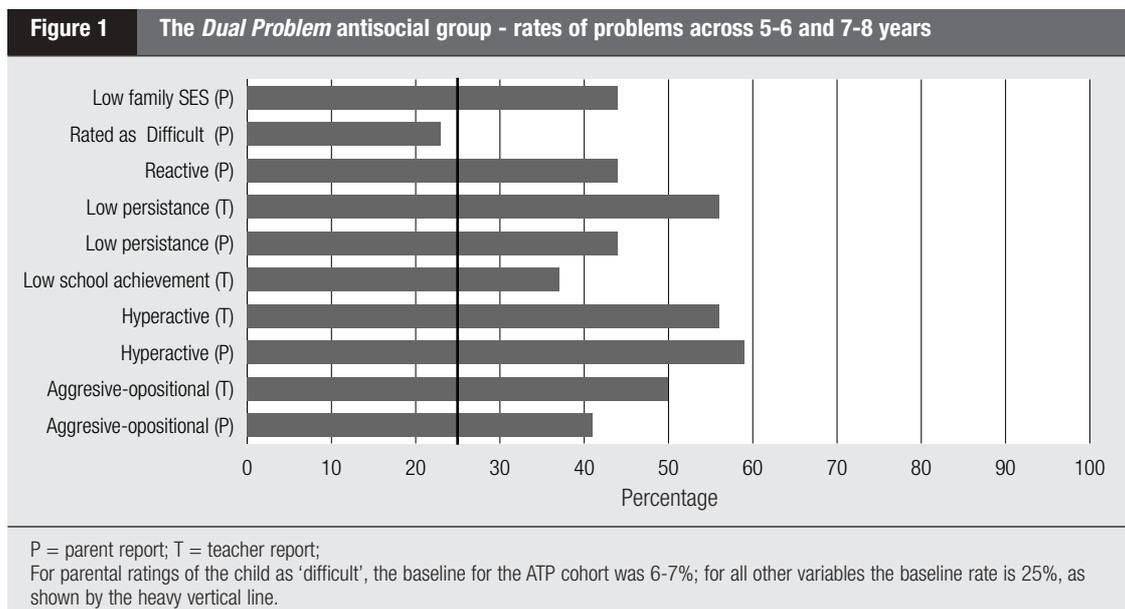
As there were relatively few significant group differences at this stage of development, these are described, rather than displayed graphically. All three antisocial groups had shown signs of aggression in the toddler and early childhood years when compared with the *Comparison* group (41 per cent of *Violent-Only* individuals were high on aggression at 1-3 years; while 41 per cent of *Dual Problem* individuals and 27 per cent of *Non-Violent-Only* were high on aggression at 3-4 years). Surprisingly, parents of individuals in the *Non-Violent-Only* group had less frequently rated their children as uncooperative at this stage (11 per cent). The *Dual Problem* group had a higher rate of language delay when young (20 per cent were slow to talk compared with 4 per cent of the *Comparison* group, with the baseline for the entire ATP cohort being 6 per cent), while the *Non-Violent-Only* group were somewhat more likely to have speech difficulties such as stuttering at 3-4 years (12 per cent compared with 6 per cent among the *Comparison* group; the baseline for the ATP cohort being 8 per cent). A disadvantaged family environment was more characteristic of the *Dual Problem* group (46 per cent) than the *Comparison* group.

The multivariate analysis showed that family socio-economic background (SES) was the most significant contributor to differences between the *Comparison* and *Dual Problem* groups, with aggression at 3-4 years also important. No variables significantly differentiated between the *Violent-Only* and *Comparison* groups in the multivariate analyses, while the *Non-Violent-Only* group was more aggressive at 3-4 years but less frequently uncooperative at 1-3 years than the *Comparison* group.

### *Early to mid childhood*

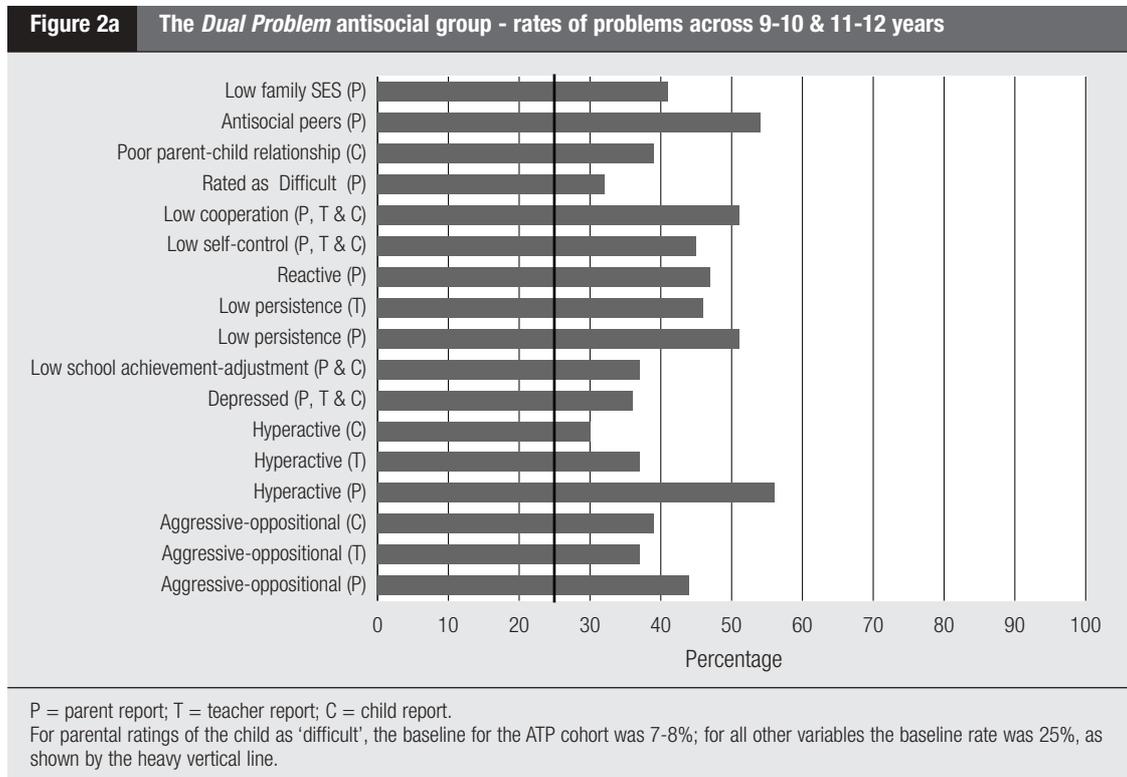
From the early to mid childhood period onwards, repeated measures across adjacent time points were available, enabling the formation of composite variables (for example, parents' ratings of their child's aggression at 5-6 and 7-8 years were combined). Thus the results described are generally based on composite variables.

The only group differences at the early to mid childhood period were between the *Comparison* group and the *Dual Problem* group. The percentage of *Dual Problem* individuals who exhibited difficulties on the various measures is shown in Figure 1. Univariate analyses showed the *Dual Problem* group had significantly higher rates of externalising behaviour problems (aggression and hyperactivity), difficult temperament (low persistence, high reactivity/volatility), problems at school, parental perception of the child as 'difficult', and a disadvantaged family environment (see Figure 1). On a number of measures (e.g. aggression, hyperactivity and low persistence), the rate of problems was quite substantial, at around 50 per cent. The baseline rate of problems in the ATP cohort is approximately 25 per cent, and the rate of problems in the *Comparison* group is similar to the baseline rate. The multivariate analysis revealed family socioeconomic environment to be the predominant factor which distinguished between the groups at this stage. (It is possible that shared variance among some of the other variables, for example between aggressive and hyperactive problems, may have diluted their impact).



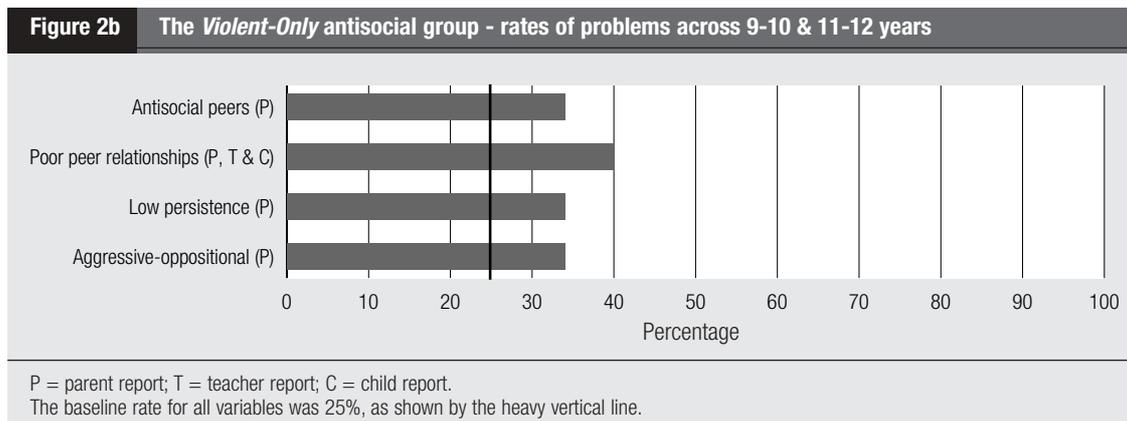
### Mid to late childhood

Figures 2a to 2c summarise group differences at the mid to late childhood period. While the majority of group differences were again between the *Comparison* group and the *Dual Problem* group, several differences between the *Comparison* group and the *Non-Violent-Only*, and *Violent-Only*, groups were found. As Figure 2a reveals, the *Dual Problem* group continued to have a significantly higher rate of problems on the domains in which earlier group differences were found, and in addition tended to have poorer social skills, a troubled parent-child relationship and to have formed friendships with other antisocial children (who were aggressive, delinquent and/or used drugs).

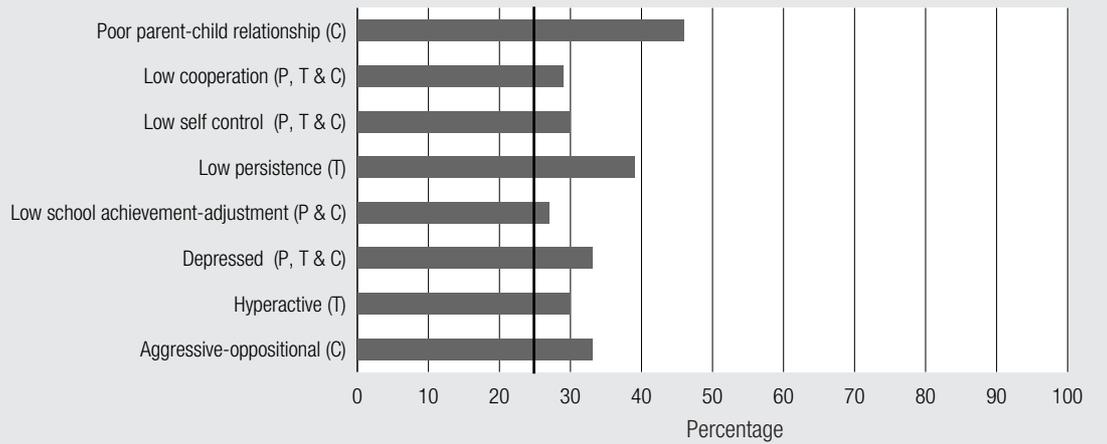


The few significant differences between the *Comparison* group and the *Violent-Only* group reflected higher rates of aggression, difficult temperament characteristics, problematic peer relationships and antisocial peer friendships among the *Violent-Only* group (Figure 2b). The *Non-Violent-Only* group had more frequently displayed behaviour problems, poorer social skills, lower persistence, and experienced a more difficult parent-child relationship than the *Comparison* group (Figure 2c).

As found at 5-6 and 7-8 years, the rate of problems was around 50 per cent among individuals in the *Dual Problem* group on some measures. In contrast, the rate of problems among individuals in the *Violent-Only* and *Non-Violent-Only* groups was lower, generally about one-third. Antisocial peer affiliations significantly differentiated both violent groups from the *Comparison* group in the multivariate analysis after the effects of other variables were controlled, while difficulties in the parent-child relationship differentiated the *Non-Violent-Only* and *Comparison* groups.



**Figure 2c** The *Non-Violent-Only* antisocial group - rates of problems across 9-10 & 11-12 years



P = parent report; T = teacher report; C = child report.  
The baseline rate for all variables was 25%, as shown by the heavy vertical line.

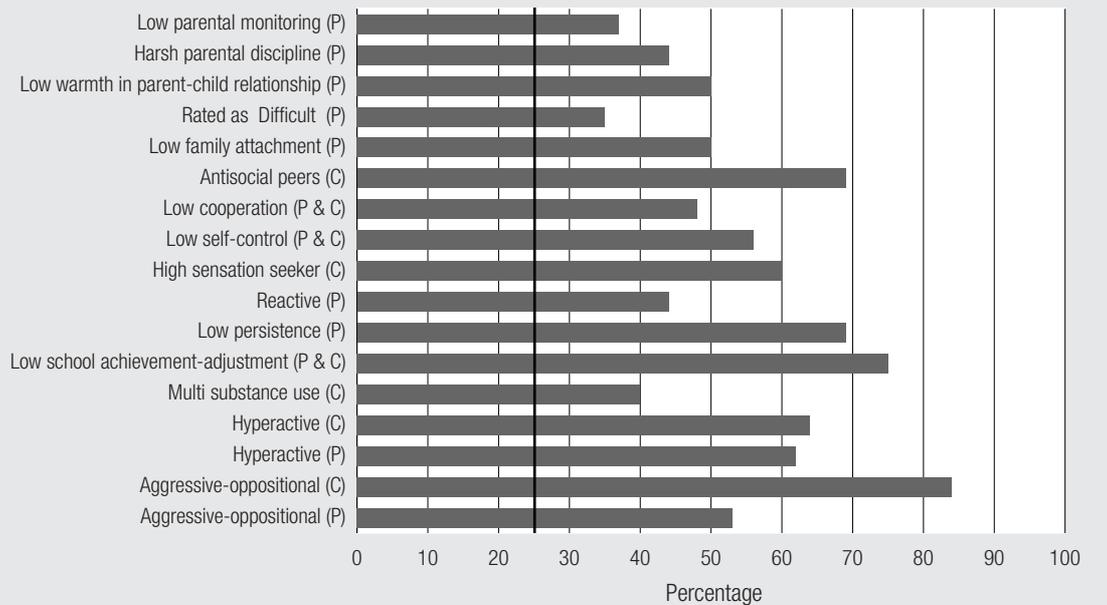
**Early to mid adolescence**

Group differences were more powerful and extensive in the early to mid adolescent period than in childhood, as shown in Figures 3a to 3c. The profile of risks identified for the two violent antisocial groups (*Violent-Only* and *Dual Problem*) was similar, principally on domains in which differences had previously been observed, but also on sensation seeking, and less effective parenting practices and styles (Figures 3a and 3b).

The fewer significant differences between the *Comparison* group and the *Non-Violent-Only* group were on aspects such as externalising behaviour problems, lower persistence and a poorer relationship with parents (also evident at the late childhood period), lower self control, antisocial peer affiliations, substance use and more frequent family stress (Figure 3c).

On many measures, the rate of problems was above 50 per cent among individuals in the *Dual Problem* group, and on aggression, school difficulties, low persistence and antisocial peer affiliations was close to, or greater than, 70 per cent. The

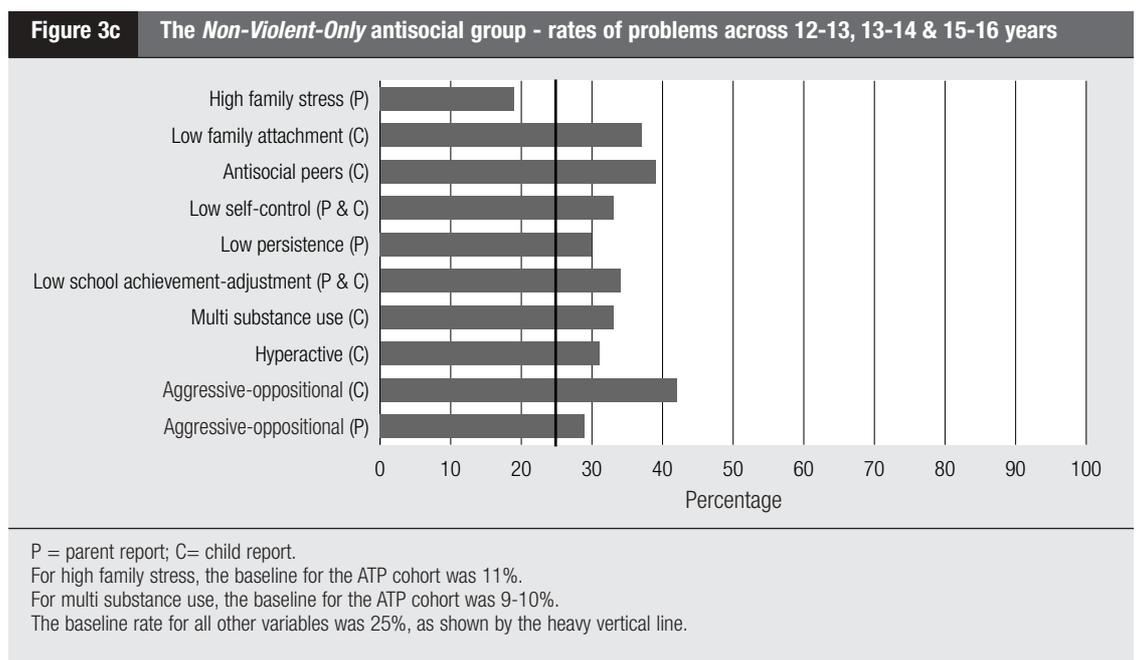
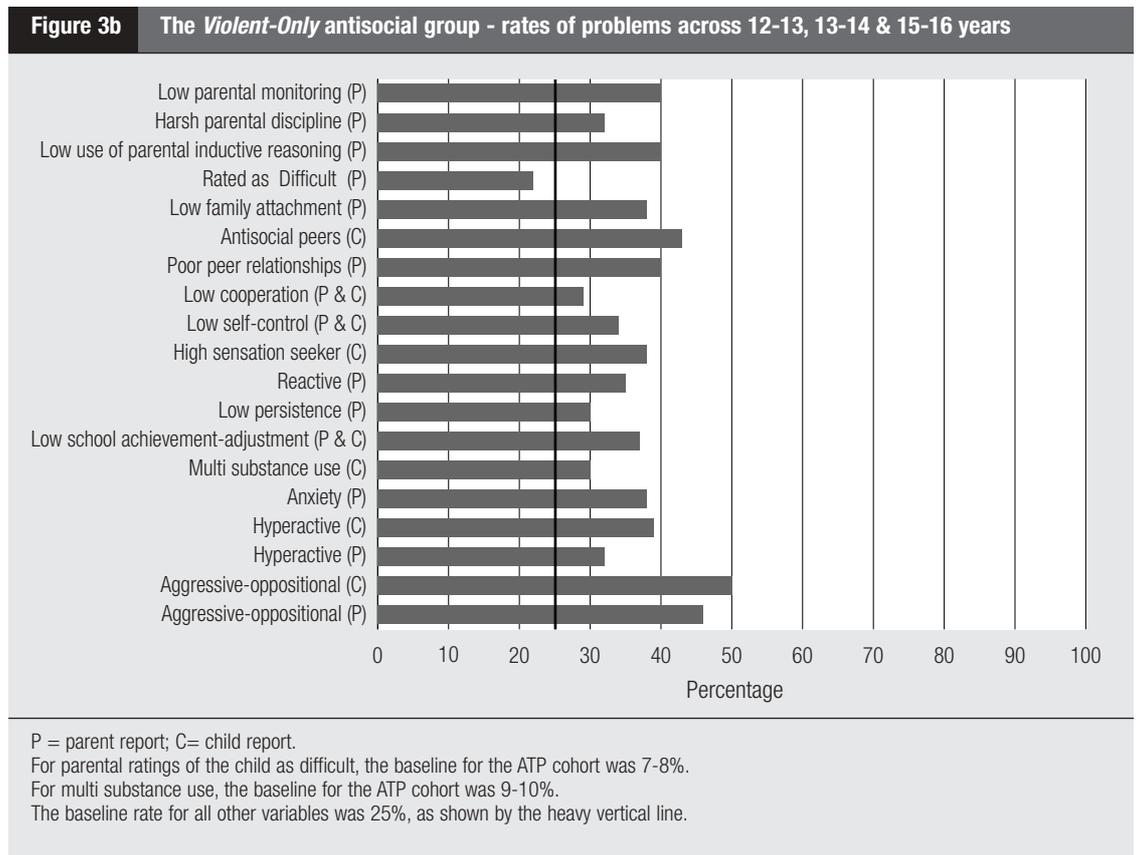
**Figure 3a** The *Dual Problem* antisocial group - rates of problems across 12-13, 13-14 & 15-16 years



P = parent report; C = child report.  
For parental ratings of the child as difficult, the baseline for the ATP cohort was 7-8%.  
For multi substance use, the baseline for the ATP cohort was 9-10%.  
The baseline rate for all other variables was 25%, as shown by the heavy vertical line.

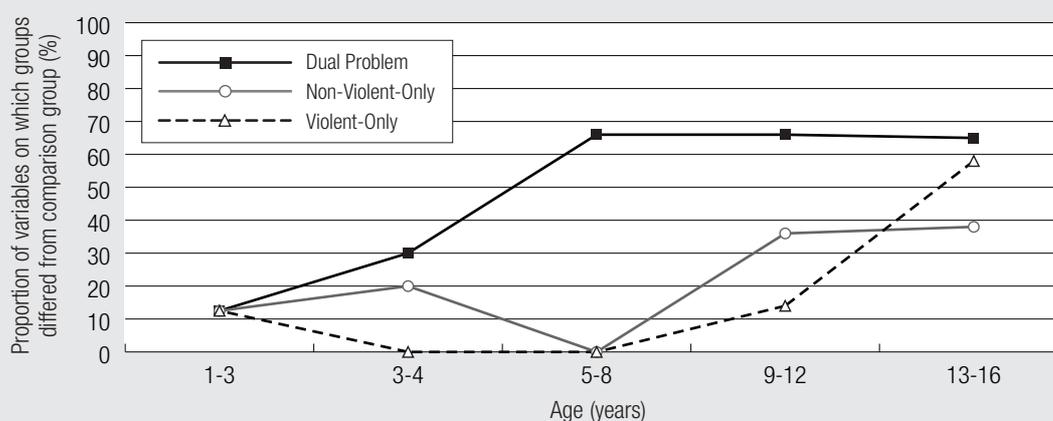
incidence of problems was generally lower (about 30-40 per cent) among individuals in the *Violent-Only* and *Non-Violent-Only* antisocial groups.

The multivariate analysis indicated that all three antisocial groups had higher rates of aggressive and oppositional behaviour than the *Comparison* group. Both violent antisocial groups were more attracted to sensation seeking, and the *Non-Violent-Only* and *Dual Problem* groups tended to be less persistent in temperament than the *Comparison* group. Multi substance use also differentiated between the *Non-Violent-Only* group and the *Comparison* group in the multivariate analysis. Trends ( $p < .10$ ) were found in the multivariate analyses for both violent groups to associate with antisocial peers more frequently, for the *Dual Problem* group to have higher rates of hyperactivity, and the *Violent Only* group to experience lower parental supervision and monitoring than the *Comparison* group.



**In summary**, this set of analyses revealed distinct developmental pathways for the three antisocial groups when compared with the *Comparison* group. These are depicted in Figure 4 below, which shows the proportion of variables on which the three antisocial groups differed from the *Comparison* group at each time point from toddlerhood to adolescence. The figure shows that the *Dual Problem* group began to diverge from the *Comparison* group from the preschool years, with numerous differences evident from early to mid childhood onwards. While some early differences were found between the *Non-Violent-Only* and the *Violent-Only* groups and the *Comparison* group, the *Non-Violent-Only* group's developmental pathway appeared to diverge during mid to late childhood, whilst the *Violent-Only* group's pathway noticeably diverged in early to mid adolescence. During adolescence, the *Violent-Only* group experienced problems on almost as many domains as the *Dual Problem* group (on about 60 per cent of variables), while the *Non-Violent-Only* group consistently experienced fewer problems than the *Dual Problem* group (a high of almost 40 per cent).

**Figure 4** Developmental pathways of the three antisocial groups



The profile of risks for each antisocial group which emerged from this set of analyses, and the stage of development at which risk factors were first evident, are summarised in Table 2 on page 11. There is considerable commonality, but also some uniqueness, in the profile of risks for each antisocial group.

## 2. Differences between the *Non-Violent-Only* antisocial group and the two Violent antisocial groups

The second set of analyses compared the *Non-Violent-Only* antisocial group to the two violent antisocial groups to further explore the question of whether there are specific risks for violent antisocial behaviour. The results of these analyses are shown in Appendix 2, and are summarised below. In general, there were few differences between the *Non-Violent-Only* and *Violent-Only* antisocial groups, but numerous differences between the *Non-Violent-Only* and *Dual Problem* antisocial groups.

### **Toddlerhood and early childhood**

Individuals in both violent groups more frequently displayed a volatile and reactive temperament style than individuals the *Non-Violent-Only* group during the toddler years. They were also more frequently uncooperative, although these differences are probably due to the low incidence of uncooperativeness in the *Non-Violent-Only* group, which was also less problematic than the *Comparison* group on this aspect. The *Dual Problem* group had higher rates of early language delay and more frequently lived in a disadvantaged family environment than the *Non-Violent-Only* group. The multivariate analyses revealed that only a disadvantaged family socio-economic background differentiated between the *Dual Problem* and *Non-Violent-Only* groups, while reactivity/volatility was more characteristic of the *Violent-Only* than the *Non-Violent-Only* group.

### **Early to mid childhood**

There were no significant differences between the *Non-Violent-Only* and *Violent-Only* groups in early to mid childhood. However, the *Dual Problem* group had significantly higher rates of externalising behaviour problems, low persistence, school difficulties, parental perceptions of the child as 'difficult' and more frequently came from a disadvantaged family environment than the

<b>Table 2 Domains on which the three antisocial groups differed from the Comparison group</b>			
<b>Domain</b>	<b>Dual Problem group</b>	<b>Violent-only group</b>	<b>Non-Violent only group</b>
Aggression	from toddlerhood	in toddlerhood, and from mid/late childhood	in toddlerhood, and from mid/late childhood
Hyperactivity	from early childhood	-----	from mid/late childhood
Depression	in mid/late childhood only	-----	in mid/late childhood only
Anxiety	-----	in adolescence	-----
Early language delay	in infancy / toddlerhood	-----	-----
Speech problems	-----	-----	in early childhood
Low school achievement/adjustment	from early childhood	in adolescence	from mid/late childhood
Reactive temperament style	from early childhood	from mid/late childhood	-----
Impersistent temperament style	from early childhood	from mid/late childhood	from mid/late childhood
Low social skills – low self control, low cooperation	from mid/late childhood	in adolescence	from mid/late childhood
Parent-child relationship difficulties	from early childhood	-----	from mid/late childhood
Antisocial peer affiliations	from late childhood	in adolescence	from late childhood
Peer relationship difficulties	-----	from mid/late childhood	-----
Multi substance use	in adolescence	in adolescence	in adolescence
Attraction to sensation seeking	in adolescence	in adolescence	-----
Less optimal parenting – less warmth, harsh discipline, low supervision	in adolescence	in adolescence	-----
Disadvantaged family environment	over lifetime	-----	-----
High family stress	-----	-----	in adolescence

*Non-Violent-Only* group. The multivariate analysis indicated that hyperactivity and a disadvantaged family environment most powerfully differentiated the *Non-Violent-Only* and *Dual Problem* groups.

### **Mid to late childhood**

At mid to late childhood, some differences between the *Non-Violent-Only* and *Violent-Only* groups were evident, reflecting higher rates of difficult temperament characteristics and antisocial peer affiliations among *Violent-Only* individuals. The *Dual Problem* and *Non-Violent-Only* groups continued to differ on the domains on which differences had been noted at early to mid childhood. The *Dual Problem* group was also more likely to have formed antisocial peer friendships and was more frequently uncooperative than the *Non-Violent-Only* group. The multivariate analysis indicated that both violent groups had higher rates of reactive, volatile temperament style than the *Non-Violent-Only* group and that antisocial peer affiliations were more common among *Dual Problem* individuals than *Non-Violent-Only* individuals.

### **Early to mid adolescence**

The *Violent-Only* antisocial group had poorer quality peer relationships during early to mid adolescence than the *Non-Violent-Only* group. There were also trends ( $p < .10$ ) for *Violent-Only* individuals to display higher levels of aggression/oppositionality and for their parents to make less use of inductive reasoning (e.g. explaining reasons, discussing problems). The numerous differences between the *Dual Problem* and *Non-Violent-Only* groups evident at this stage were similar to those found at the earlier time points. In addition, the *Dual Problem* group was more likely to experience less effective parenting (less warmth, harsher discipline). The multivariate analysis showed that attraction to sensation seeking was more characteristic of individuals in the *Dual Problem* group than individuals in the *Non-Violent-Only* group.

**In summary**, this set of analyses revealed relatively few differences between the *Non-Violent-Only* and *Violent-Only* groups. These were primarily on temperament characteristics such as lower persistence and higher reactivity/volatility at the toddler and late childhood stages among individuals in the *Violent-Only* groups, and poorer peer relationships during adolescence. In contrast, there were numerous differences between the *Dual Problem* and *Non-Violent-Only* groups. The *Dual Problem* group displayed a more difficult temperament style at all stages of development, had higher rates of delayed early language development, aggressive, acting out behaviour problems from mid childhood, poorer social skills from late childhood, more difficulties at school in late childhood and adolescence, more difficulties in relationships with parents from mid childhood, antisocial peer affiliations from late childhood, a disadvantaged family environment at all time points, and higher rates of less effective parenting in adolescence (e.g. less warmth, more harsh discipline).

## Discussion and implications

The first set of analyses compared three groups of adolescents who exhibited differing patterns of violent and non-violent antisocial behaviour to a *Comparison* group in an attempt to identify the age/stage of development at which the antisocial groups began to diverge from the 'normal' developmental pathway, and to describe the precursors of these three types of antisocial behaviour. The second set of analyses compared non-violent antisocial individuals to adolescents who engaged in violent behaviour in an effort to further understand the uniqueness of risks for these different types of antisocial behaviours. Some conclusions and implications that may be drawn from the findings are presented below.

### 1. Developmental pathways

The profile of the *Dual Problem* antisocial group was notably and consistently more problematic when compared with the *Comparison* group. This group was reported as experiencing difficulties from early in life by parents, teachers and children and across a wide range of domains. Consistent and powerful precursors were a disadvantaged family environment, aggressive-oppositional and hyperactive behaviour problems, a reactive and impersistent temperament style, difficulties at school, and friendships with other antisocial youth.

The numerous differences between the *Violent-Only* antisocial group and the *Comparison* group in early to mid adolescence were preceded by a relatively small number of differences in toddlerhood and childhood. The profile of risk factors for the *Violent-Only* group was quite similar to that of *Dual Problem* group over the adolescent period.

In contrast, differences between the *Non-Violent-Only* antisocial group and the *Comparison* group were generally evident from mid to late childhood onwards and relatively constant in number, although some very early differences were found. The most consistent precursors identified for the *Non-Violent-Only* group were aggressive-oppositional and hyperactive behaviour problems, a less persistent temperament style, lower self control, difficulties at school, and problems in the parent-child relationship.

Thus, the groups appeared to diverge from a 'normal' pathway at different ages: early in childhood for the *Dual Problem* antisocial group, at mid to late childhood for the *Non-Violent-Only* antisocial group, and in adolescence for the *Violent-Only* antisocial group. These findings have important implications for crime prevention strategies, particularly for the timing and content of prevention and early intervention efforts.

### 2. Violent adolescents are a heterogeneous group

These results suggest that physically aggressive, violent adolescents are not a homogeneous group, and that it is important to distinguish between those who are primarily aggressive and those who engage in both violent and non-violent antisocial behaviour. For example, problems among the *Dual Problem* group tended to be evident early while problems among the *Violent-Only* group tended to emerge relatively late. Many risks were common to both groups, such as aggression, a volatile temperament style, low perseverance, attraction to sensation seeking, less optimal parenting, and friendships with antisocial youth. However, some specific risks were also found, such as early language problems, hyperactivity, parent-child relationship difficulties and a disadvantaged family environment among the *Dual Problem* group; and anxiety and poor peer relationships among the *Violent-Only* group. Furthermore, the rate of problems among *Dual Problem* group individuals was substantially greater than among the *Violent-Only* group individuals.

The differential timing, profile and severity of risks identified by this research has significant implications for early intervention and prevention strategies. Additionally, the results suggest that previous research which simply compared violent and non-violent youth may have been hampered by heterogeneity within the violent group and may have provided a somewhat misleading picture.

### 3. Precursors of violent and non-violent adolescent antisocial behaviour

In regards to the question of whether the precursors of violent and non-violent antisocial behaviour were similar or unique, clearly, many risks were common to all three antisocial groups and differentiated them from the *Comparison* group. These

were on attributes such as aggressive-oppositional behaviour problems, school achievement and adjustment, and social skills such as self control and cooperation. Thus, crime prevention strategies aimed at improving children's functioning in these domains are likely to have a broad pay-off as they promise to benefit a substantial number of young people who engage in antisocial behaviour, whether or not they are involved in violent or non-violent types of antisocial behaviour.

However, some risks were specific to the two violent antisocial groups. For example, both violent groups were more attracted to sensation seeking in adolescence. Additionally, these groups tended to be more reactive temperamentally than the non-violent antisocial group, i.e. they were more volatile and had difficulty controlling emotions. This finding is consistent with Henry et al's (1998) finding that early lack of control predicted violent offending at 18 years of age, and also fits with Gottfredson and Hirschi's (1991) behavioural control theory. Thus, intervention strategies aimed at assisting young people to develop better emotional control and a broader repertoire of conflict resolution skills, as well as strategies which encourage the channeling of sensation seeking tendencies into socially acceptable activities, are likely to be particularly beneficial for those who are prone to violent antisocial behaviour.

Several facets of peer relationships appeared salient precursors for violent and physically aggressive behaviour. Individuals from both violent antisocial groups were more likely to have formed friendships with other antisocial youth from late childhood onwards, and the *Violent-Only* group tended to have poorer quality peer relationships from that time. The two violent groups also appeared to be receiving less effective parenting in the adolescent years on aspects such as supervision and monitoring, harsh discipline, quality of relationship and use of reasoning. Thus in domains relating to interpersonal relationships, the violent groups appeared to experience more difficulties, which again carries implications for prevention and intervention efforts.

Some risks were specific to the *Dual Problem* antisocial group alone, such as early language delay (although it should be noted that a minority of participants, only one-in-five, exhibited this characteristic). While few parents overall perceived their child to be 'difficult', this was much more common among parents of individuals in the *Dual Problem* group.

Most notable was the impact of a disadvantaged family environment, reflected in being in the lowest socio-economic quartile. Socio-economic influences may be felt through their impact on the economic, material and psychological conditions of family life. For example, economic stress appears to increase the risk of family break-up (Weatherburn & Lind, 2001), and social disadvantage is associated with higher rates of mental disorder (Vinson, 1999). A closer examination of some of these factors was undertaken, to explore how the socio-economic effects found in the current study may have exerted an influence. The three antisocial groups did not differ from the *Comparison* group on factors such as size of family, rate of marital break-up, or the family's experience of recent stressful life events. Thus, while direct evidence cannot be provided by the current study, it is likely that the socio-economic effects found are a result of lack of resources and enduring strain on parents, which may have impeded their ability to rear their children, rather than a result of family structural characteristics.

#### **4. The Dual Problem group was much more problematic than the Violent-only and Non-Violent groups**

The results from the set of analyses comparing the *Non-Violent-Only* with the *Violent-Only* and *Dual Problem* antisocial groups suggest a complex picture. On the one hand, there were relatively few differences between the *Violent-Only* group and the *Non-Violent-Only* group. On the other hand, there were numerous differences between the *Non-Violent-Only* and *Dual Problem* groups.

One conclusion that could be drawn is that the *Dual Problem* antisocial group is qualitatively different from the other two antisocial groups. Support for this conclusion comes from findings that problems among this group emerged at a much earlier age, a greater diversity of risk factors was identified for this group, and there was a trend for the *Dual Problem* group to have committed more non-violent antisocial acts than the *Non-Violent-Only* group. It was also noteworthy that the rate of problems among individuals from the *Dual Problem* group was higher; ranging from rates of 30 per cent to 40 per cent across the toddler and childhood years to rates of 70 per cent to 80 per cent in adolescence on a number of domains. In contrast, rates of problems were generally much lower among individuals in the *Violent-Only* and *Non-Violent-Only* groups. Additionally, the *Dual Problem* group contained many more boys (85 per cent were male) compared with the *Violent-Only* and *Non-Violent-Only* groups (the proportions of males were 65 per cent and 54 per cent respectively).

These findings highlight the importance of providing specific interventions and assistance for vulnerable young people and families such as those from the *Dual Problem* group before problems become entrenched. They suggest that the most appropriate time would be prior to the commencement of primary school, as by 5-8 years of age, there were already extensive differences between the *Dual Problem* and *Comparison* groups, with differences being found on 66 per cent of the variables included in the analyses. Factors that particularly characterised the *Dual Problem* group in the pre-school years were: a disadvantaged family environment, and aggressiveness, with a minority also experiencing early language delay. Children who display this constellation of characteristics might particularly benefit from targeted interventions, as might their families.

#### **5. Strengths and limitations of the research**

This research has both strengths and limitations. In terms of limitations, the two violent antisocial groups were quite small (40 *Violent-Only* individuals and 34 *Dual Problem* individuals) and replication of these findings with larger samples is clearly desirable.

While our measure of violence used data from a single time point only (17-18 years of age), over 60 per cent of individuals in the *Violent-Only*, *Non-Violent-Only* and *Dual Problem* groups had been persistently antisocial from 13-14 to 17-18 years, suggesting antisocial behaviour was an entrenched problem for the majority. Similar to other studies (e.g. Loeber, Farrington, Stouthamer-Loeber & Van Kammen, 1998), risk factors were defined by designating the most problematic 25 per cent of the ATP cohort as showing difficulties on that particular characteristic. Hence, risk status did not imply the presence of a recognisable disorder (e.g. a psychiatric condition), or necessarily indicate severe dysfunction. Our study is based on a single cohort who were born in 1982, and is a study of antisocial behaviour among the current generation of adolescents. Intervention and prevention strategies designed for future generations will also find valuable the findings emerging from studies such as the newly commissioned 'Growing Up in Australia' (the Longitudinal Study of Australian Children), (Sanson, Nicholson, Ungerer, Zubrick et al., 2002), in understanding the effects of prevailing socio-economic and related factors on children's development.

The study also has significant strengths. The most notable are: the existence of detailed information from very early in life covering many aspects of children's and families' lives, provided by a community sample from diverse backgrounds. Also notable are the use of multiple time points and informants to gain a more complete and reliable picture of the children's development and wellbeing.

**In conclusion**, distinct developmental pathways for violent and non-violent adolescent antisocial behaviour were identified. Some risk factors were common to both violent and non-violent antisocial adolescents, while others were unique to particular subtypes. The importance of distinguishing between subtypes of violent youth was demonstrated, and the longstanding difficulties of the small group who engage in both violent and non-violent antisocial behaviour were highlighted. It is suggested that children who appear to be on this developmental pathway would particularly benefit from targeted intervention and preventative efforts, which would be of greatest value in the early years of life.

### 3 Resilience against adolescent antisocial behaviour: The role of personal attributes and the family, peer, and school environment

Young people are responsible for more offences than any other age group. For example, 10-24 year olds accounted for more than half of all offenders processed by Victoria Police in 1999/2000 (Crime Prevention Victoria, 2002). Substantial research has been devoted to the identification of risk factors for, and precursors of, adolescent antisocial behaviour. However, much less is known about the factors and processes that prevent ‘at risk’ or vulnerable young people from developing antisocial behaviour. Why do young people who are exposed to similar risks differ in their propensity for antisocial behaviour later in life? What individual or environmental strengths assist young people to withstand high levels of risk to lead socially responsible and law-abiding lives (Howard & Johnson, 2000)? This section will address these important questions.

#### Characteristics that promote resilience against antisocial behaviour

Characteristics that reduce the possibility that an ‘at-risk’ individual will engage in adolescent antisocial behaviour can be found in many aspects of life, ranging from individual attributes; through family, school, and peer influences; to characteristics of the wider neighbourhood and community. Table 3 provides a list of characteristics that have been found to reduce the development of adolescent antisocial behaviour, and to protect young people from this outcome. It is noteworthy that, thus far, researchers have been able to identify considerably fewer protective factors than risk factors (see *Patterns and Precursors of Adolescent Antisocial Behaviour: First Report* for details of risk factors identified by previous research).

<b>Table 3 Characteristics associated with resilience against antisocial behaviour</b>				
<b>Protective Factors</b>				
<b>Child factors</b>	<b>Family factors</b>	<b>School context</b>	<b>Life events</b>	<b>Community and cultural factors</b>
social competence	supportive caring parents	positive school climate	meeting significant person	access to support services
social skills	family harmony	prosocial peer group	moving to new area	community networking
above average intelligence	more than two years between siblings	responsibility and required helpfulness	opportunities at critical turning points or major life transitions	attachment to the community
attachment to family	responsibility for chores or required helpfulness	sense of belonging/bonding		participation in church or other community group
empathy	secure and stable family	opportunities for some success at school and recognition of achievement		community/cultural norms against violence
problem solving	supportive relationship with other adult	school norms re violence		a strong cultural identity and ethnic pride
optimism	small family size			
school achievement	strong family norms and morality			
easy temperament				
internal locus of control				
moral beliefs				
values				
self related cognitions				
good coping style				

*Source:* Homel et al., 1999, p138. Reproduced with the kind permission of the Commonwealth Attorney-General's Department.

#### Person-based and variable-based approaches

In attempting to identify factors that may prevent an individual from developing antisocial behaviour in adolescence, many studies have used a variable-based approach. That is, relationships between particular variables (for example, high school achievement, good social skills) and engagement in antisocial behaviour have been investigated (as discussed by Haapasalo, Tremblay, Boulerice & Vitaro, 2000). While this approach enables the drawing of general conclusions about the nature of the relationships between variables (for example, high school achievement is negatively related to antisocial behaviour), it does not shed light on the developmental pathways and processes involved. It also tends to assume that these relationships are relatively stable and constant, and does not enable the investigation of possible across-time changes or key transition points. Furthermore, the question of how different clusters of variables interact with each other to impact

on the propensity for antisocial behaviour is rarely addressed. These issues have important implications for the nature and timing of crime prevention programs.

An alternative strategy is to use a person-based approach, whereby subgroups of individuals who possess similar constellations of characteristics at one age, but who have differing outcomes at a later age, are identified. This approach can shed light on differing development pathways and facilitates the identification of key ages or stages of development in which significant changes in pathways occur. The characteristics that distinguish subgroups at different points in time, and the stability of group differences, can also be investigated, which in turn, can inform crime prevention efforts.

In this section, a person-based approach is adopted in an endeavour to identify personal attributes and environmental characteristics that may play a role in preventing the development of adolescent antisocial behaviour among young people identified as being 'at-risk'. Drawing upon previous research which identified risks for adolescent antisocial behaviour (Vassallo et al., 2002), 'at-risk' children within the Australian Temperament Project sample who engaged in little or no subsequent adolescent antisocial behaviour (*Resilient* group) are compared to 'at-risk' children who were subsequently persistently antisocial during adolescence (*Antisocial* group). Both groups are compared to a third group which comprises the remainder of the sample, providing a 'normative' comparison. The trajectories of these three groups are compared to assess similarities and differences between the 'at risk' *Resilient* and *Antisocial* groups, and the extent to which the two 'at risk' groups' pathways diverge from the normative *Comparison* group over childhood and adolescence. A wide range of factors, encompassing individual characteristics, the family and school environment, and peer relationships, are examined in order to identify the characteristics that differentiate the groups at different points in time.

The aim of these comparisons is firstly to describe the developmental pathways of the three groups, and to identify changes in trajectories, as well as the age and developmental stage at which changes may occur, and secondly, to determine whether there are personal and environmental characteristics that consistently differentiate the *Resilient* and *Antisocial* groups, which may provide protection from the progression to adolescent antisocial behaviour.

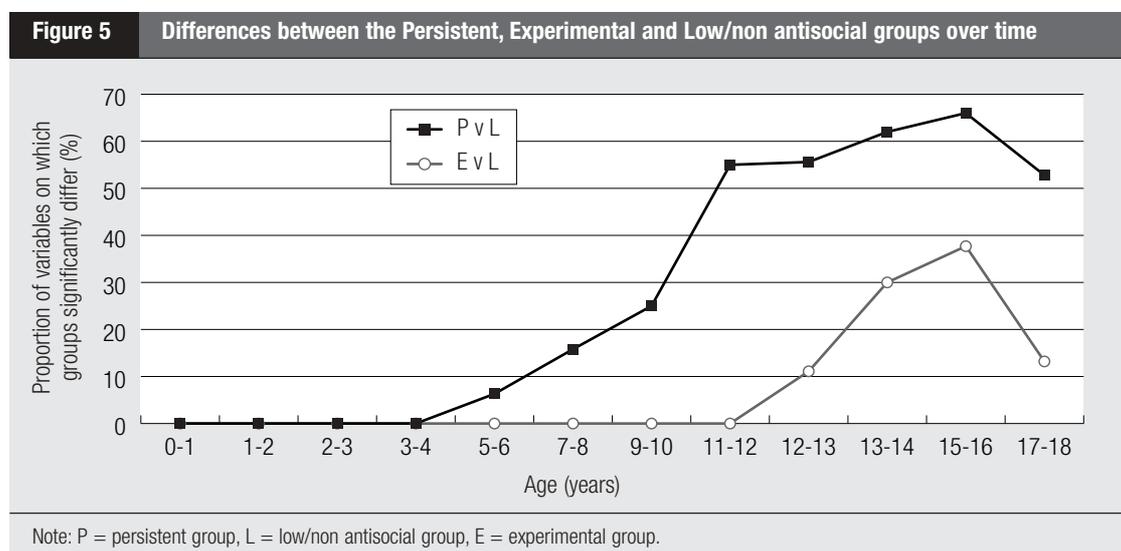
## Methodology

The rationale for deciding upon the age at which to identify children as 'at risk' for adolescent antisocial behaviour is next described.

### Patterns of adolescent antisocial behaviour

A person-based approach was adopted in the First Report to identify different patterns of antisocial behaviour from 13 to 18 years of age (see Vassallo et al., 2002, for further details on methodology). In brief, three groups of adolescents were identified: a group who were persistently antisocial over this time period – the '*Persistent*' group (131 individuals, 65 per cent of whom were males); a group who displayed no, or low, levels of antisocial behaviour over this time period – the '*Low/non antisocial*' group (844 individuals, 41 per cent of whom were males); and a third group who engaged in antisocial behaviour in early to mid adolescence and then desisted – the '*Experimental*' group (88 individuals, 43 per cent of whom were males).

Individuals who later displayed a persistent pattern of adolescent antisocial behaviour could be distinguished from those who engaged in little or no adolescent antisocial behaviour from 5-6 years of age (see Figure 5). Differences between



the *Persistent* and *Low/non antisocial* groups steadily increased during mid-childhood, before sharply increasing at 11-12 years.

As can be seen in Figure 5, 11-12 years was the first time point at which the *Persistent* group was more problematic than the *Low/non antisocial* group on a large number of variables (more than half of the variables on which the two groups were compared). The *Persistent* group exhibited significantly more difficult temperament characteristics, more behavioural and emotional problems, lower social skills, more difficulties in the parent-child relationship, and associated more frequently with antisocial peers than their *Low/non antisocial* counterparts.

This time point (11-12 years) appears to be an important threshold point, as it represents the earliest age at which powerful and widespread differences between the *Persistent* and *Low/non antisocial* groups were evident. Hence, the age of 11-12 years was selected as the time point to identify participants as being 'at risk' of subsequent antisocial behaviour.

### **Formation of risk index**

The rationale for the selection of risk factors, which were subsequently used to form a cumulative risk index, is next described.

As outlined in the First Report (Vassallo et al., 2002), the characteristics that distinguished the *Persistent* group from the *Low/non antisocial* group at 11-12 years were similar to those identified in other studies that have examined risks for antisocial behaviour (see Homel et al., 1999; Farrington, 1998; Rutter, Giller & Hagell, 1988 for examples). The majority of group differences were on personal attributes (e.g. temperamental characteristics, social skills, behavioural and emotional adjustment); however, some differences in environmental characteristics were also found.

Many theories of the development of antisocial behaviour propose that problematic individual characteristics are essential precursors to antisocial behaviour. For example, Gottfredson and Hirschi (1990) propose that poor self-regulation capacities are central to the development of antisocial behaviour. Patterson and colleagues (1992) suggest that individual characteristics, such as a difficult temperamental style, act as building blocks to this type of behaviour. Similarly, Moffitt and colleagues (2001) emphasise the importance of individual characteristics such as subtle cognitive deficits, difficult temperamental characteristics and hyperactivity in the genesis of this type of behaviour.

While individual characteristics are thus seen to place an individual 'at-risk' of antisocial behaviour, environmental characteristics (such as family, peer and school environments) are seen to accentuate or reduce this risk in vulnerable individuals. As persuasively argued by Catalano and Hawkins (1996) in their Social Development Model, the individual's environment may be a source of support and provide protection from the development of such behaviour. Environmental characteristics may also offer the 'best chance' for intervention efforts, as they are potentially modifiable, and may be more amenable to change than intrinsic characteristics.

Consequently, it was decided to focus on children's level of intrinsic risk at 11-12 years (as measured by individual characteristics such as temperament style, behaviour problems and social skills) in developing a risk index, enabling the protective effects of environmental factors such as family factors, peer relationships and the school environment, to be assessed.

Hence, the following variables, which significantly differentiated between the *Persistent* and *Low/non antisocial* groups at 11-12 years (Vassallo et al., 2002), were included in the risk index:

- High activity temperament style (as reported by parents)
- High negatively reactive temperament style (as reported by parents)
- Low task persistence temperament style (as reported by parents)
- Low task orientation temperament style (as reported by teachers)
- High aggression (as reported by parents, teachers and/or children<sup>4</sup>)
- High hyperactivity (as reported by parents, teachers and/or children)
- Low cooperativeness (as reported by parents, teachers and/or children), and
- Low self-control (as reported by parents, teachers and/or children)

If an individual was in the most problematic 25 per cent of the ATP cohort on a particular characteristic, he/she was deemed to be 'at-risk' on that characteristic. A total risk score was then calculated for each participant by summing the number of risks he/she possessed. As ratings from different respondents (parents, teachers, children) were counted separately, the maximum possible score on this index was 16.

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4 For characteristics that differentiated the persistent and low/non antisocial groups by all sources of report at 11-12 years, separate parent, teacher and child ratings on this characteristic were included in the risk index.

The ATP cohort's distribution of risks is shown in Table 4 below.

<b>Table 4</b> Distribution of risks across the ATP sample				
Risk score	Proportion of sample		Cumulative total	
	n	%		
0	320	21.8	21.8	
1	250	17.0	38.7	
2	208	14.1	52.9	
3	130	8.8	61.7	
4	126	8.6	70.3	
5	112	7.6	77.9	
6	82	5.6	83.5	
7	73	5.0	88.4	
8	44	3.0	91.4	
9	39	2.7	94.1	
10	34	2.3	96.4	
11	13	0.9	97.3	
12	17	1.2	98.4	
13	7	0.5	98.9	
14	8	0.5	99.5	
15	5	0.3	99.8	
16	3	0.2	100.0	

#### **Formation of Resilient, Antisocial and Comparison groups**

From Table 4 it can be seen that the majority of the sample had between 0 and 2 risks present at 11-12 years. Therefore, a cut-off above this point appeared logical to define risk status (see footnote 5 for rationale). A cut-off of 3 or more risks was used to select the following groups<sup>5</sup>).

- (1) An 'Antisocial' group (n=78) – these participants had 3 or more risks at 11-12 years and displayed *Persistent* antisocial behaviour during adolescence. Approximately two-thirds (64 per cent) of individuals who were persistently antisocial in adolescence met the criteria for this group.
- (2) A 'Resilient' group (n=286) – these participants displayed 3 or more risks at 11-12 years but were *Low/non antisocial* during adolescence. About a third (36 per cent) of participants who engaged in little or no antisocial behaviour in adolescence fit the criteria for this group.

These two groups differed significantly in their average number of risks (*Antisocial* = 6.5 risks, *Resilient* = 5.4 risks), and to some extent their profile of risks at 11-12 years of age. It was important to compare groups who were at equivalent risk, so that any differences subsequently identified could not be said to be the result of variation in risk status. Therefore, a smaller *Resilient* group of 100 children was randomly selected from the 286 *Resilient* children. Comparison of this smaller *Resilient* group with the *Antisocial* group revealed that the two groups did not significantly differ in their number, profile of risks at 11-12 years, or proportions of males and females.

Finally, a 'Comparison' group (n=1107, average of 1.3 risks) who comprised the remainder of the sample was selected to provide a normative comparison group. Table 5 summarises the group selection process.

<b>Table 5</b> Formation of Antisocial, Resilient and Comparison groups				
Risk score at 11-12 yrs	Outcome (13-18 yrs)			Group
3 or more ('at-risk') (n = 693)	→	Persistently antisocial (n = 78)	→	Antisocial (n=78)
	→	Low/non antisocial (n = 286)	→	Resilient (random sample of 100)
	→	Other outcomes <sup>1</sup> (n = 329)	→	Comparison (n = 1107)
Less than 3 ('low risk') (n = 778)	→	Any outcome (n = 778)	→	

<sup>1</sup> This category included participants who displayed some antisocial behaviour during adolescence but did not meet the criteria for the Persistent or Low/Non antisocial groups (e.g. may have exhibited an experimental, late-onset, or desisting pattern).

5 The decision to use a criterion of 3 or more risks was made following the guideline that an ideal risk index should maximise the proportion of problematic individuals that it identifies as being 'at-risk' and minimise the proportion of problem-free individuals that are identified as being 'at-risk'. In this way, high specificity (ie. the proportion of low-risk individuals who did not develop antisocial behaviour) and sensitivity (the proportion of 'at-risk' individuals who did develop antisocial behaviour) are achieved.

The characteristics of the three groups are shown below in Table 6.

<b>Table 6 Risk characteristics of the <i>Antisocial</i>, <i>Resilient</i> and <i>Comparison</i> groups</b>			
	<b>Antisocial (n=78)</b>	<b>Resilient (n=100)</b>	<b>Comparison (n=1107)</b>
<b>Gender</b>	<b>72% male</b>	<b>60% male</b>	<b>48% male</b>
<b>Mean Number of Risks</b>	<b>6.5 (SD=3.2)</b>	<b>5.7 (SD=2.6)</b>	<b>1.3 (2.5)</b>
<b>Risk Profile</b>			
Aggressive - parent	38.2%	31.0%	12.5%
Aggressive - teacher	36.6%	25.3%	11.7%
Aggressive - child	47.4%	38.0%	18.3%
Hyperactive - parent	46.8%	41.0%	16.4%
Hyperactive - teacher	33.8%	29.9%	15.2%
Hyperactive - child	23.1%	27.0%	10.6%
Active - parent	51.3%	43.0%	20.1%
Reactive - parent	46.2%	40.0%	19.3%
Low persistence - parent	41.0%	44.0%	18.5%
Low task orientation - teacher	47.1%	47.1%	19.8%
Uncooperative - parent	39.7%	26.0%	15.6%
Uncooperative - teacher	36.6%	42.5%	17.7%
Uncooperative - child	57.7%	42.0%	18.5%
Low self-control - parent	32.1%	35.0%	14.9%
Low self-control - teacher	47.9%	39.1%	18.3%
Low self-control - child	42.3%	41.0%	20.5%

## Findings

In the following sections, group trajectories and significant differences between the *Antisocial*, *Resilient* and *Comparison* groups at different ages or stages of development and across different domains of functioning are presented<sup>6</sup>. These findings reveal distinct developmental pathways for the two 'at risk' groups, and identify a number of protective factors.

### Developmental pathways

Summarising the general trends (an example of which can be seen in Figure 6 on page 20), the two 'at-risk' groups (*Antisocial*, *Resilient*) consistently displayed more 'acting out' behavioural problems, more difficult temperamental characteristics, and were rated by their parents as more 'difficult' than the *Comparison* group from toddlerhood to late childhood. In addition, during late childhood, the *Antisocial* and *Resilient* groups exhibited more emotional problems, lower social skills, and more school adjustment difficulties. The *Resilient* and *Antisocial* groups were also generally less involved with their peers at this time, and had more negative peer relationships than the *Comparison* group.

However, in early to mid adolescence, the *Resilient* group's pathway began to diverge from that of the *Antisocial* group, and significant differences between these two groups began to emerge. For example, from the age of 12-13 years, there was a trend for the *Resilient* group to display fewer behavioural and emotional difficulties, an easier temperamental style, and more social competence than the *Antisocial* group. Furthermore, parents of *Resilient* individuals noted an improvement in their relationship with their child over this time period. The *Resilient* group continued to improve over mid-adolescence, and by 17-18 years, these adolescents resembled the *Comparison* group on many personal characteristics and environmental factors. The *Antisocial* group, on the other hand, continued to display significant difficulties in a wide range of domains throughout the adolescent years.

### Protective factors

While the *Antisocial* and *Resilient* groups displayed many of the same personal and environmental characteristics during toddlerhood and childhood, there was one characteristic on which the groups always differed. At all time points at which association with antisocial peers (i.e. friendships with children who were aggressive, delinquent or used drugs) was measured, the *Resilient* group was observed to socialise less frequently with such individuals than the *Antisocial* group, their rates of involvement being similar to those of the *Comparison* group.

There were also consistent group differences on levels of parental supervision and adolescent sensation-seeking. *Resilient* adolescents were consistently reported to receive higher levels of parental supervision (by parent-report) and to be less attracted to thrill-seeking and adventurous activities (by their own report) than their *Antisocial* counterparts. The *Resilient* group was

<sup>6</sup> Multinomial logistic regression analyses were performed for each data collection wave and source of report (parent, teacher, and child/teen).

similar to the *Comparison* group on both these measures. As these aspects were not measured until adolescence, it is not possible to say whether these group differences were already evident in early childhood, or a result of developments in the *Resilient* group during early adolescence. In any case, the strength and consistency of these differences is noteworthy.

Furthermore, the *Resilient* (but not the *Antisocial*) group consistently exhibited a less gregarious personal style than the *Comparison* group (e.g. they were less assertive, less involved with their peers, and not as closely bonded to their friends).

These patterns will be explored in more detail below.

### Group differences across domains

Following the general description above, we now examine in detail, group differences across various domains of functioning. To aid description of group trends, differences between the three groups (*Antisocial*, *Resilient* and *Comparison*) are presented pictorially for each domain.

Figures 6 through 26 present the mean standardised scores (z-scores)<sup>7</sup> for each of the three groups (*Antisocial*, *Resilient* and *Comparison*) on the specific characteristics measured (e.g. school adjustment, aggression) over time.

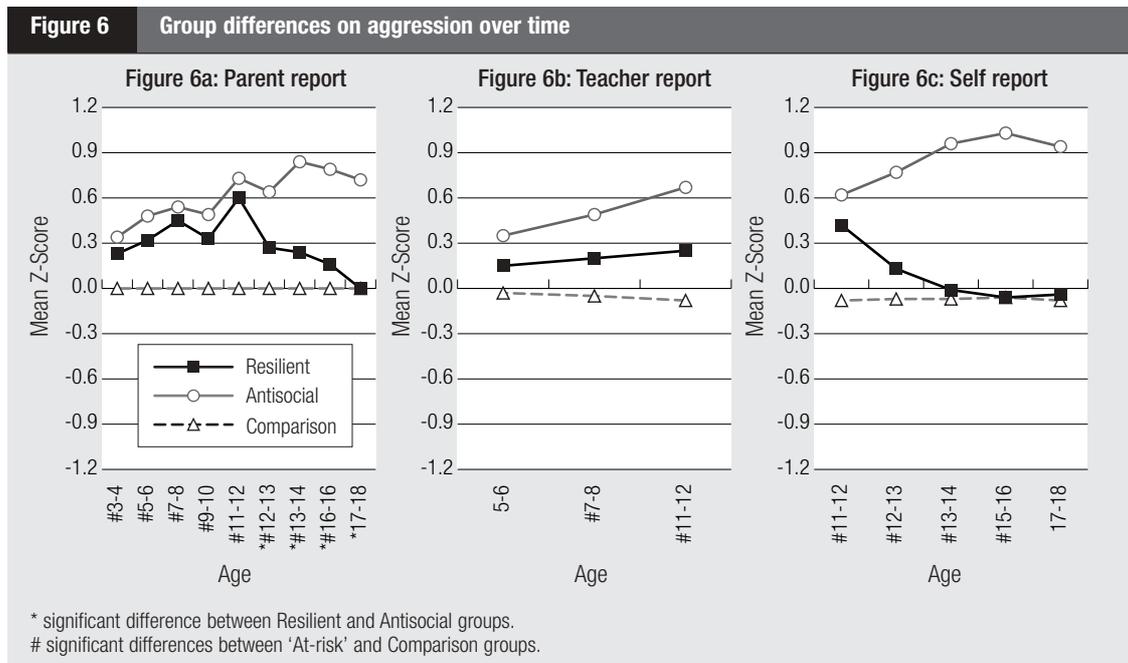
To aid readability, only significant differences between the two 'at-risk' groups, or both 'at-risk' groups and the comparison group are indicated in these graphs. An asterisk (\*) indicates a significant difference ( $p < .05$ ) between the *Resilient* and *Antisocial* groups, while a hash (#) signifies a significant difference between the two 'at-risk' groups (*Antisocial* and *Resilient*) and the *Comparison* group. For those interested in a more detailed description of significant group differences please refer to Appendices 3 and 4, which are available electronically from the Australian Institute of Family Studies and Crime Prevention Victoria.

### Individual characteristics

#### Behavioural and emotional problems

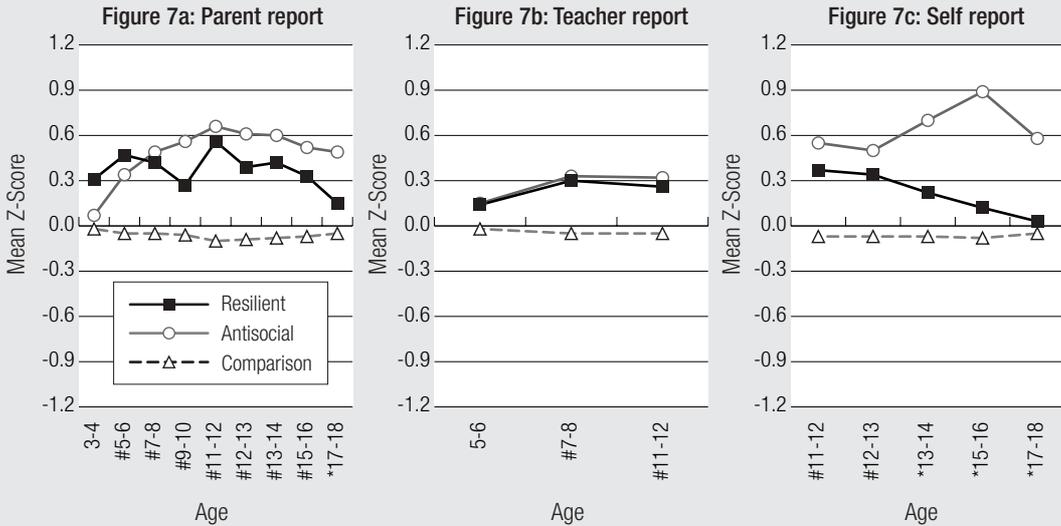
While the *Antisocial* and *Resilient* groups did not differ significantly on parent- or teacher- ratings of aggression and hyperactivity during toddlerhood and childhood (see Figures 6 and 7), both groups were consistently rated as more aggressive and more hyperactive than the *Comparison* group over this time period. However, while levels of aggression and hyperactivity remained high among the *Antisocial* group, parent- and self-reports indicate a marked decrease in these behavioural problems among the *Resilient* group from early adolescence. This decrease was so large that by 17-18 years, the *Resilient* group resembled the *Comparison* group on these behavioural problems.

Similarly, the *Resilient* group was found to have decreasing levels of depression from early to late adolescence by comparison with the *Antisocial* group (Figure 8).



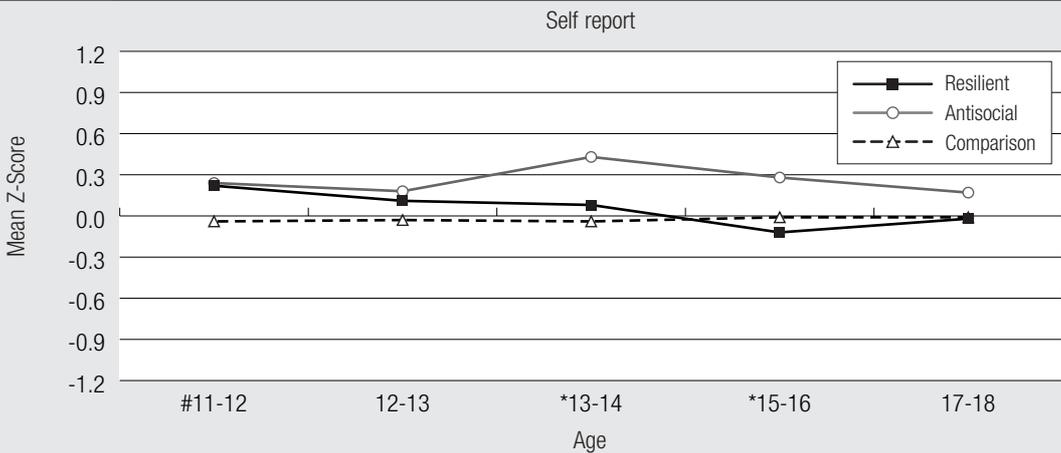
<sup>7</sup> The z-score transformation makes variables comparable, as it creates new variables which all have a mean of 0 and a standard deviation of 1.

**Figure 7** Group differences on hyperactivity over time



\* significant difference between Resilient and Antisocial groups.  
 # significant differences between 'At-risk' and Comparison groups.

**Figure 8** Group difference on depression over time



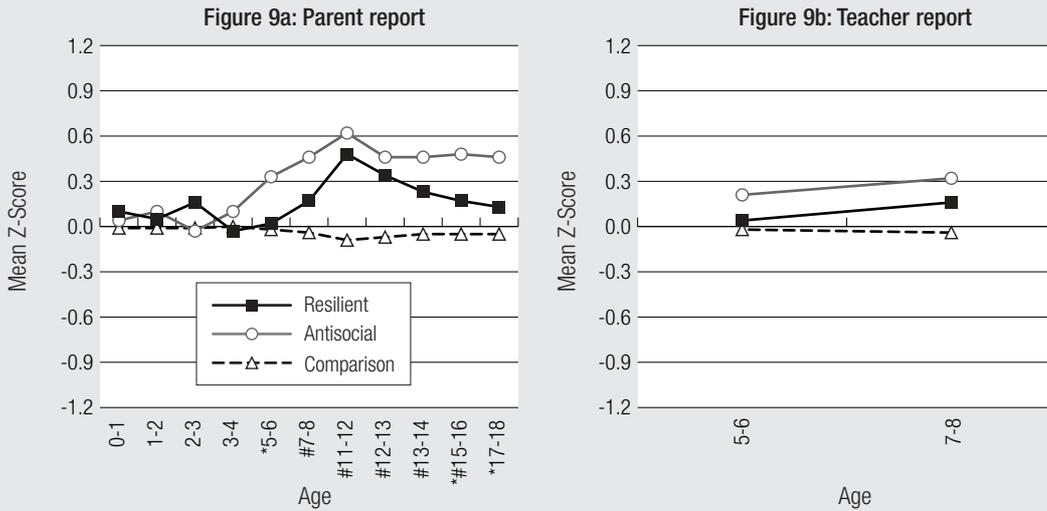
\* significant difference between Resilient and Antisocial groups.  
 # significant differences between 'At-risk' and Comparison groups.

*Temperament/personality*

The *Antisocial* and *Resilient* groups generally did not differ on facets of temperament (negative reactivity or task persistence) during infancy, childhood or early adolescence (see Figures 9 and 10). Both groups were rated by their parents and teachers as significantly more reactive (volatile, intense, moody) and less task persistent (able to maintain attention on tasks or activities) than the *Comparison* group, with these differences peaking at 11-12 years. However, parent-reports suggest an improvement on these characteristics among the *Resilient* group over adolescence, with this group becoming significantly less reactive and more task persistent than the *Antisocial* group by 15-16 years of age. In contrast, levels of volatility remained quite stable for the *Antisocial* group, and task persistence difficulties increased until mid-adolescence (15-16 years). The *Antisocial* group remained significantly more 'difficult' temperamentally than the *Resilient* and *Comparison* groups at 17-18 years.

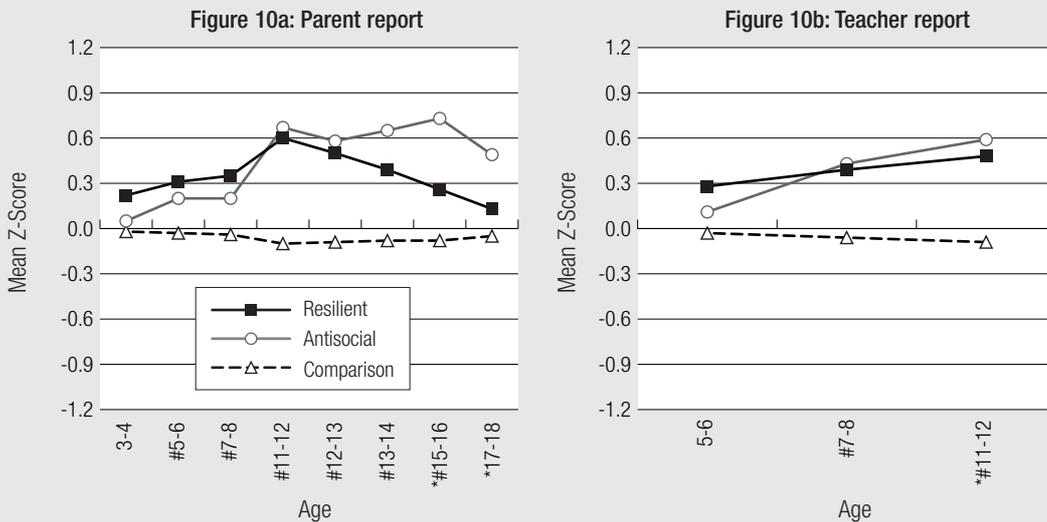
Adolescents' ratings of their personality, which were obtained during mid-to late-adolescence, also suggest that the two 'at-risk' groups were significantly different at this time (see Figures 11-13). For example, at both time points that personality characteristics were measured (15-16 and 17-18 years), the *Resilient* group rated themselves as more agreeable and more conscientious than the *Antisocial* group, with ratings similar to the *Comparison* group. The *Antisocial* group, on the other hand, reported that they were more extraverted than *Resilient* and *Comparison* group individuals.

**Figure 9** Group differences on negative reactivity over time



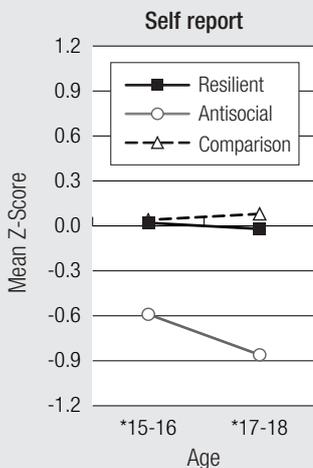
\* significant difference between Resilient and Antisocial groups.  
# significant differences between 'At-risk' and Comparison groups.

**Figure 10** Group differences on task orientation/persistence over time

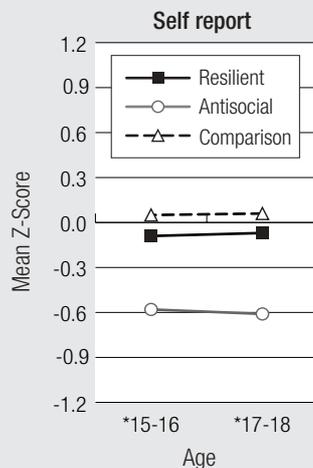


\* significant difference between Resilient and Antisocial groups.  
# significant differences between 'At-risk' and Comparison groups.

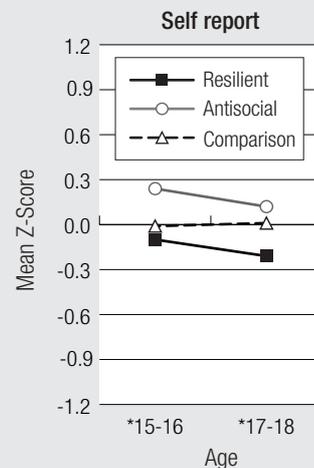
**Figure 11** Group differences on agreeableness over time



**Figure 12** Group differences on conscientiousness over time



**Figure 13** Group differences on extraversion over time

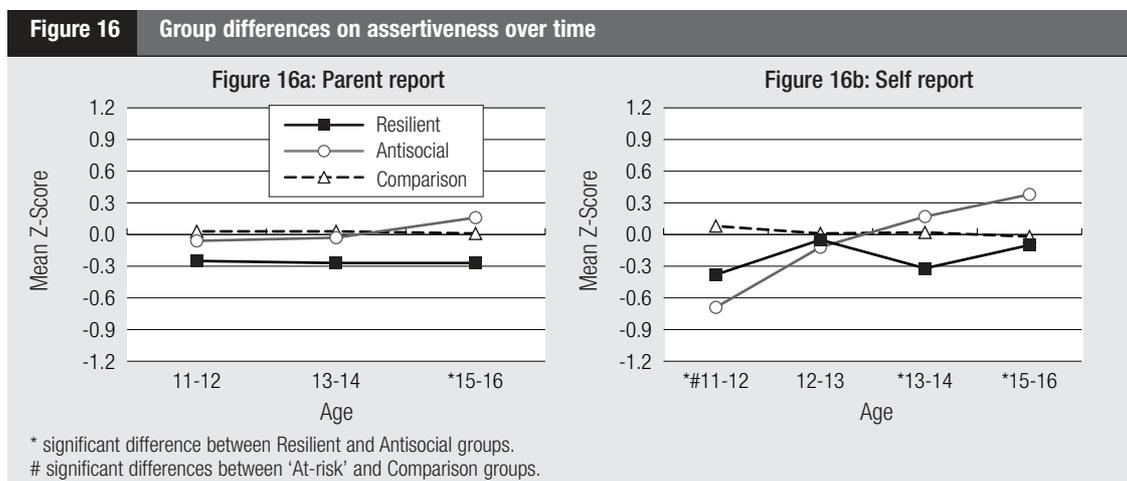
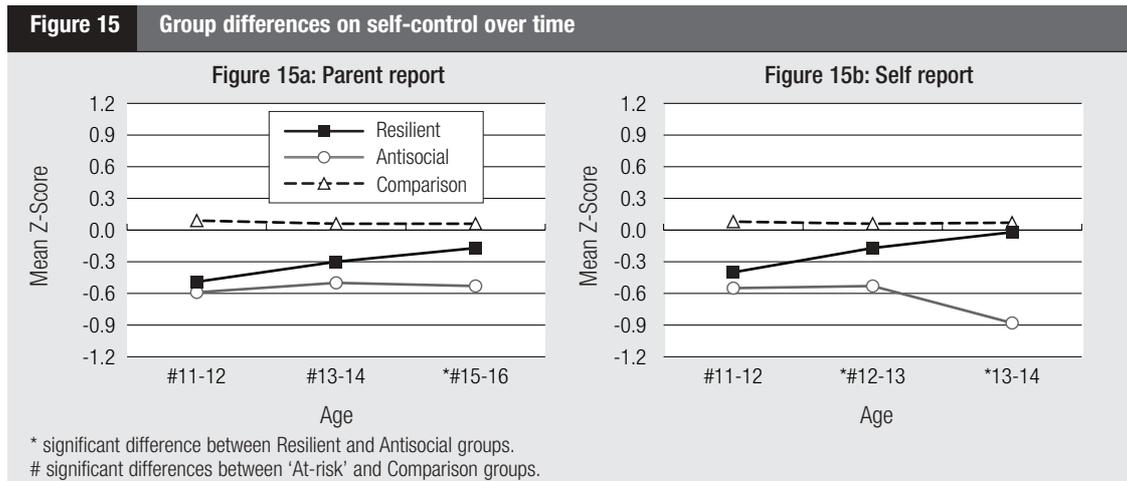
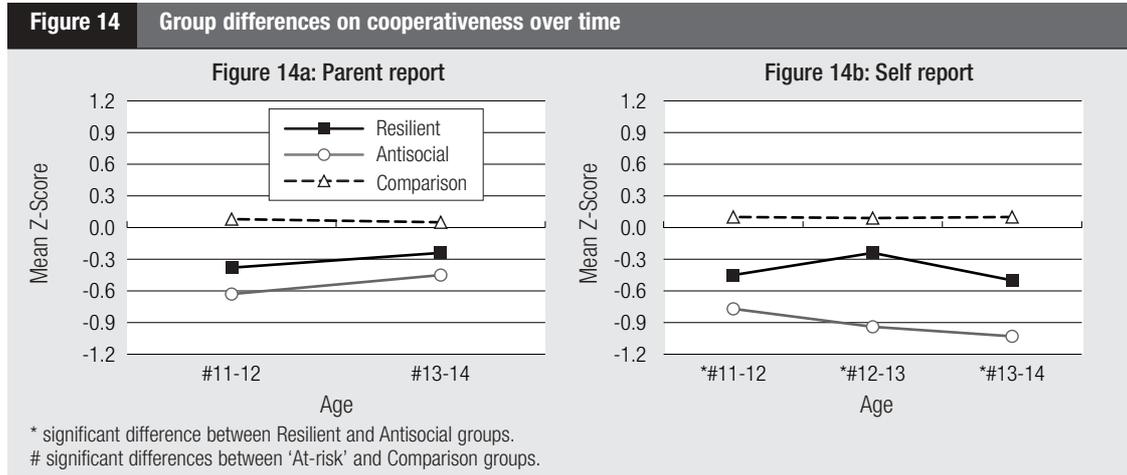


\* significant difference between Resilient and Antisocial groups.  
# significant differences between 'At-risk' and Comparison groups.

Social competence

Parent- and self-reports indicate an improvement in levels of cooperation and self-control among the *Resilient* group over the early adolescent years (see Figures 14 and 15). While both 'at-risk' groups were less co-operative and exhibited poorer self-control than the *Comparison* group during late childhood (11-12 years), by early adolescence, levels of cooperativeness and self-control among the *Resilient* group were approaching those of the *Comparison* group. In contrast, there was no clear pattern of improvement or deterioration in these social skills for the *Antisocial* group<sup>8</sup>.

Both 'at-risk' groups were less assertive than the *Comparison* group at 11-12 years (refer to Figure 16). However, while the *Resilient* group remained less assertive than the rest of the sample, both parent- and self-reports suggest an increase in assertiveness among the *Antisocial* group over early-to-mid adolescence.



<sup>8</sup> Self-reports indicated a decline in levels of cooperativeness and self-control in early adolescence for the Antisocial group, but parent reports suggested little change (self-control) or some improvement (cooperativeness) over this time period.

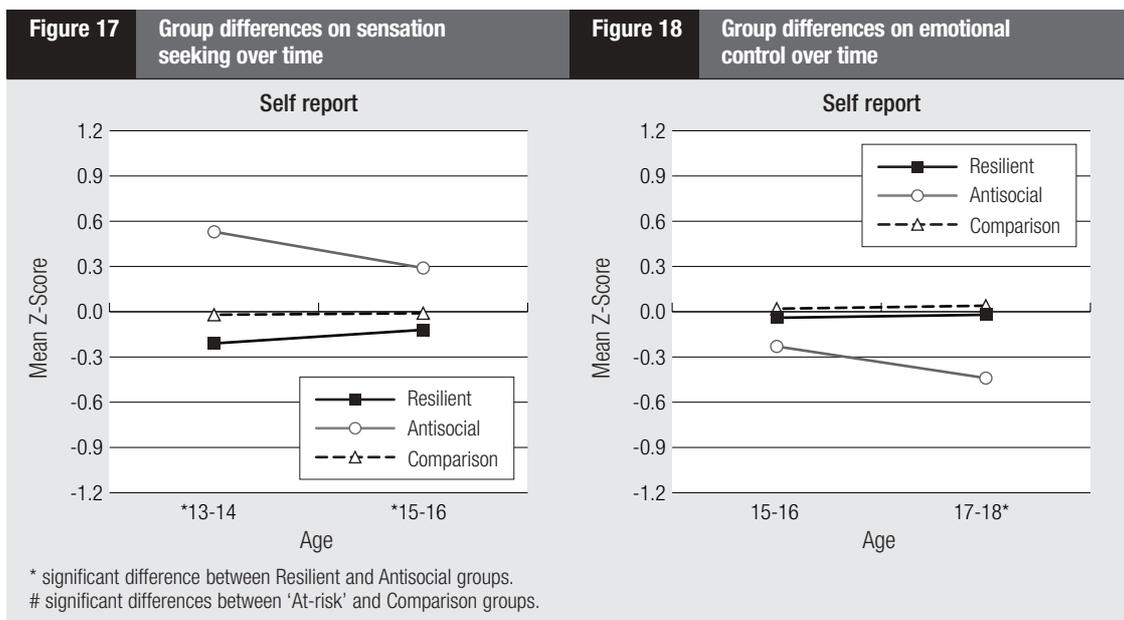
### Other individual characteristics

When adolescents were aged 13-14 and 15-16 years, they were asked to indicate their attraction to thrill-seeking and adventurous activities (see Figure 17). At both time points, the *Resilient* group rated themselves as significantly less attracted to these types of activities than the *Antisocial* group. While the *Antisocial* group reported a significantly higher attraction to thrill-seeking and adventurous activities than the *Comparison* group, the *Resilient* group rated themselves as slightly lower on sensation-seeking than the *Comparison* group. These group differences were most pronounced at 13-14 years. At mid-adolescence (15-16 years) the *Resilient* group also indicated that they were less attracted to risk-taking activities than the *Antisocial* group, with ratings similar to the *Comparison* group.<sup>9</sup>

The *Antisocial* and *Resilient* groups also differed significantly in the manner in which they responded to problem situations or difficulties. When questioned about their coping strategies at 17-18 years of age, the *Resilient* group reported less reliance on the use of drugs to cope with difficulties than both the *Antisocial* and *Comparison* groups. The *Antisocial* group, on the other hand, reported higher use of this strategy than both the other groups. The *Resilient* group also reported venting their feelings less frequently when stressed than the *Antisocial* group and were similar to the *Comparison* group in their use of this strategy.

At late-adolescence (17-18 years) participants were also questioned about their hopes and plans for the future. Comparison of the two 'at-risk' groups revealed that individuals in the *Resilient* group were more optimistic about the future and had a clearer idea of the type of person they wished to become than the *Antisocial* group. While the *Resilient* group were similar to the *Comparison* group in their future aspirations, the *Antisocial* group had significantly lower aspirations than the *Comparison* group.

Significant differences in emotional control were also found at this time, with the *Resilient* and *Comparison* groups reporting that they were better at regulating their emotions than the *Antisocial* group (see Figure 18). Thus, over adolescence it appeared that the *Resilient* group developed better emotional control than the *Antisocial* group.



### Family environment

#### Family factors

Parent reports indicated that *Antisocial* participants were more likely to belong to a 'non-intact' family unit (37 per cent *Antisocial* participants compared to 22 per cent of both *Resilient* and *Comparison* participants); to have witnessed higher levels of marital conflict during their lifetime; and to have experienced less family 'cohesion' (at 17-18 years) than both the *Resilient* and *Comparison* groups. Furthermore, parents of *Antisocial* children reported experiencing higher levels of family adversity (at 17-18 years) and had rated their life as more difficult (at 7-8 years) than parents of *Comparison* children.

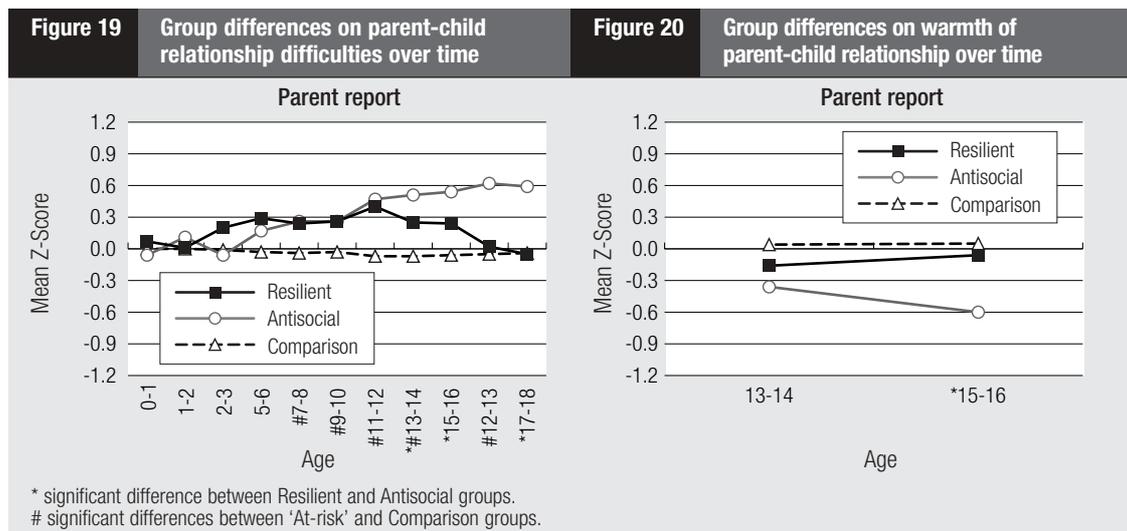
#### Parent-child relationship

Parents of *Antisocial* and *Resilient* participants did not differ in their ratings of child difficulty over childhood (refer to Figure 19). From 5-6 years of age, parents of both groups consistently rated their child as more 'difficult' than children in the *Comparison* group. However, while parents of *Antisocial* individuals reported an increase in child difficulty over adolescence, parents of the *Resilient* group noted a substantial improvement in their relationship with their child over this time period. By mid-adolescence, the ratings of parents of *Resilient* adolescents were almost identical to those of parents of *Comparison* adolescents.

<sup>9</sup> Risk-taking was measured at one time point (1998), when participants were aged 15-16 years.

Parents of *Resilient* individuals also reported an increase in the level of warmth in their relationship with their child during early- to mid- adolescence (see Figure 20). While parents of the two 'at-risk' groups reported less warmth in their relationship with their child at 13-14 years than parents of *Comparison* children, by 15-16 years, parents of *Resilient* individuals rated their relationship with their child almost as positively as parents of *Comparison* children. Conversely, parents of *Antisocial* individuals reported a decrease in the level of warmth in their relationship with their child over this same time period.

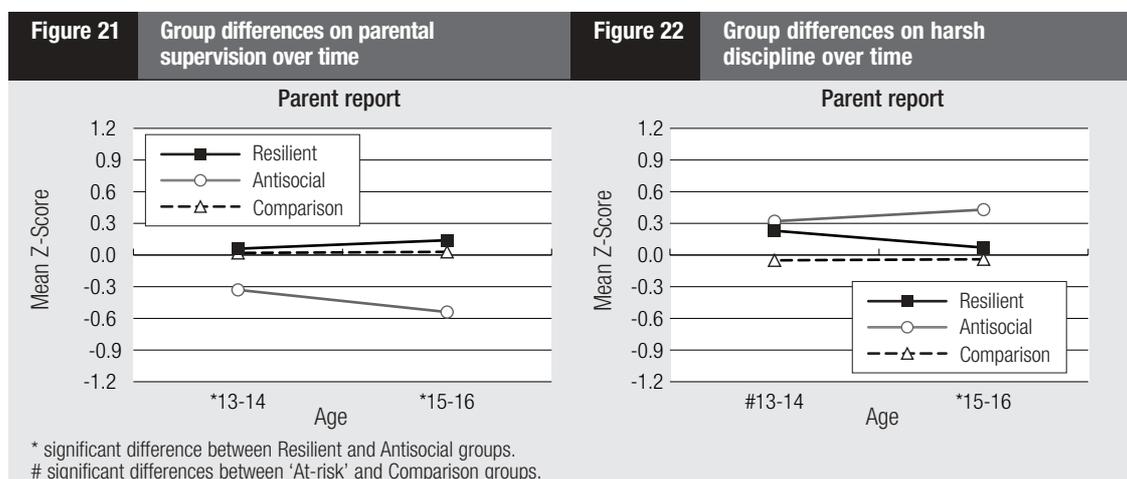
Self-reports offer further support for differences between the two 'at risk' groups in the quality of their parent-child relationships. For example, while both the *Antisocial* and *Resilient* groups reported less attachment to their parents than the *Comparison* group during early adolescence, the *Resilient* group reported being more attached to their parents than the *Antisocial* group at this time. These group differences were still evident at 17-18 years, with the *Resilient* group reporting higher levels of warmth, communication and trust in their relationship with their mothers, than the *Antisocial* group, and resembling the *Comparison* group on these markers of attachment.



### Parenting practices

The two 'at-risk' groups clearly differed in the level of parental supervision they received during adolescence (see Figure 21). At both time points at which parental supervision was measured (13-14 years and 15-16 years), parent-reports indicated that the *Resilient* group received significantly higher levels of parental supervision than the *Antisocial* group, with levels of parental supervision slightly exceeding those experienced by the *Comparison* participants. Differences between the two 'at-risk' groups increased from early- to mid-adolescence.

Significant group differences were also observed in parent's use of harsh discipline (Figure 22). While parent-reports suggest that both 'at-risk' groups were disciplined more severely than the *Comparison* group during early- to mid- adolescence, there was a decrease in the use of harsh discipline (e.g. yelling, scolding when the teenager misbehaves) among parents of the *Resilient* group between 13-14 and 15-16 years. In contrast, there appeared to be an increase in the use of severe discipline by parents of *Antisocial* adolescents over this period. Although the longitudinal dataset cannot determine cause and effect in this instance (i.e. whether the parents of *Antisocial* children resorted to punishment in response to earlier misbehaviour or whether parental use of harsh discipline exacerbated behaviour problems in this group), in any case, harsh punishment does not appear effective in preventing antisocial behaviour.



### Parental cigarette use and alcohol use

The two 'at-risk' groups differed in terms of their father's smoking and drinking habits. Fathers of *Antisocial* children were observed to smoke cigarettes and consume alcohol more frequently than fathers of *Resilient* and *Comparison* children.

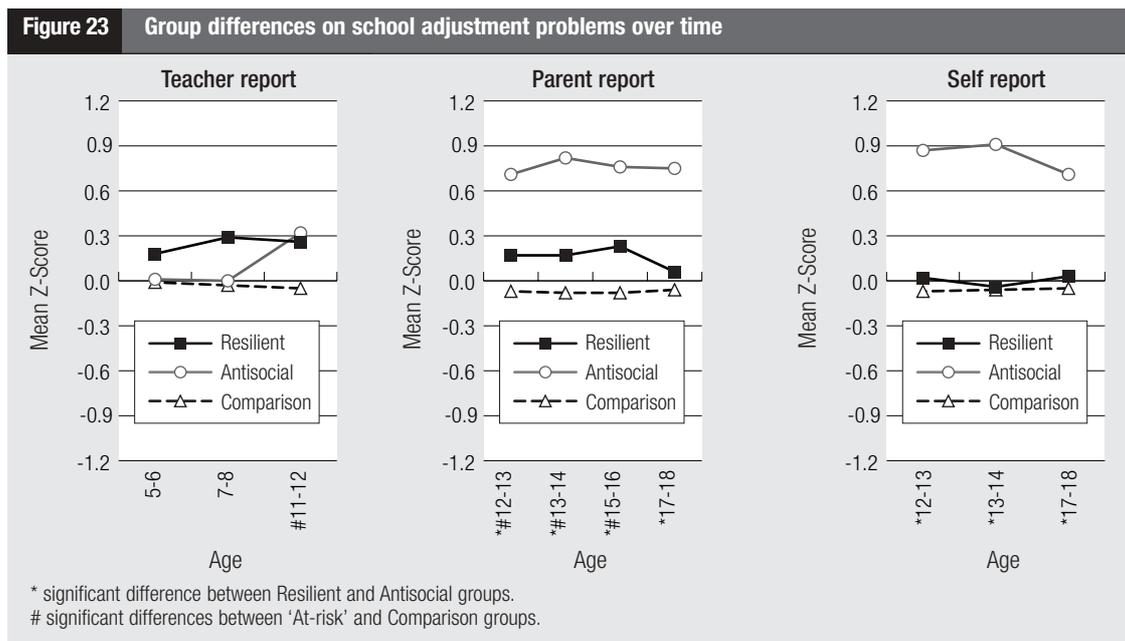
### School environment

#### School adjustment and achievement

Teacher reports suggest that the *Resilient* group exhibited significantly more school adjustment difficulties than the *Comparison* group during the primary school years (at 7-8 years and 11-12 years). The *Antisocial* group, on the other hand, did not display difficulties with their school adjustment until late primary school (11-12 years) at which time they exhibited a similar level of difficulties to the *Resilient* group (see Figure 23a).

During secondary school, parent- and self-reports indicated that the *Antisocial* group was experiencing much greater difficulty adjusting to the routines and demands of school-life than the *Resilient* and *Comparison* groups, whereas levels of school adjustment either remained stable (according to parent reports) or improved (according to self-reports), among the *Resilient* group (see Figures 23b and 23c). These group differences remained relatively stable throughout the secondary school years, with the *Antisocial* group exhibiting significantly more school adjustment difficulties than the *Resilient* and *Comparison* groups.

Clear group differences were also evident in participants' attitudes to school during the secondary school years. Individuals in the *Antisocial* group reported less positive feelings towards school, less positive relationships with teachers, less confidence in their ability to succeed at school, and were less likely to perceive their schooling as relevant for future life, than individuals in the *Resilient* and *Comparison* groups.

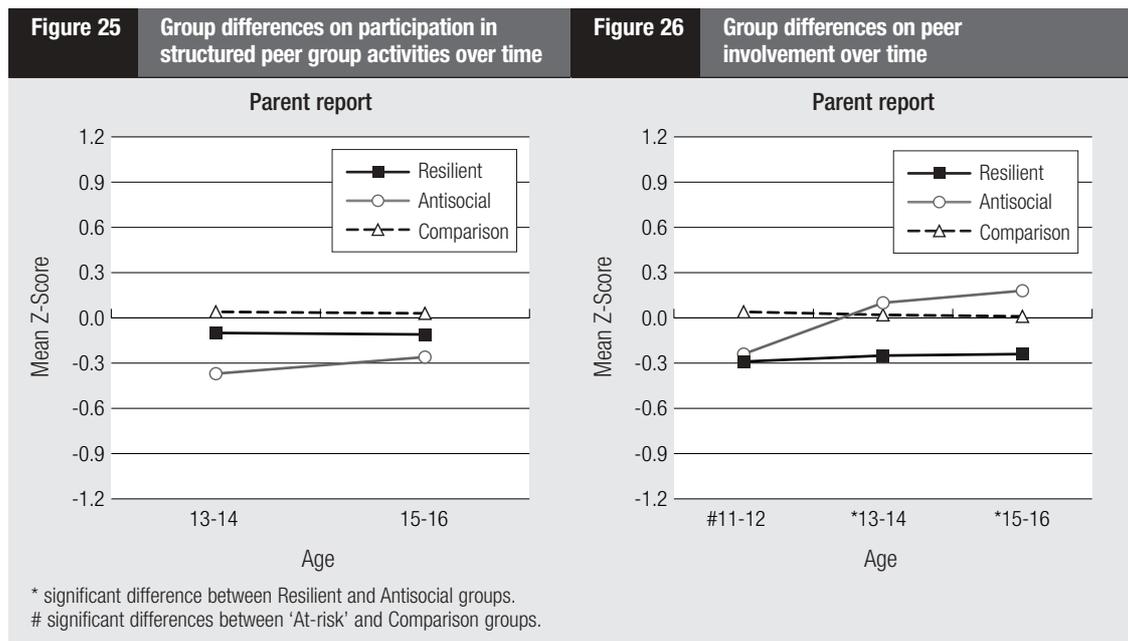
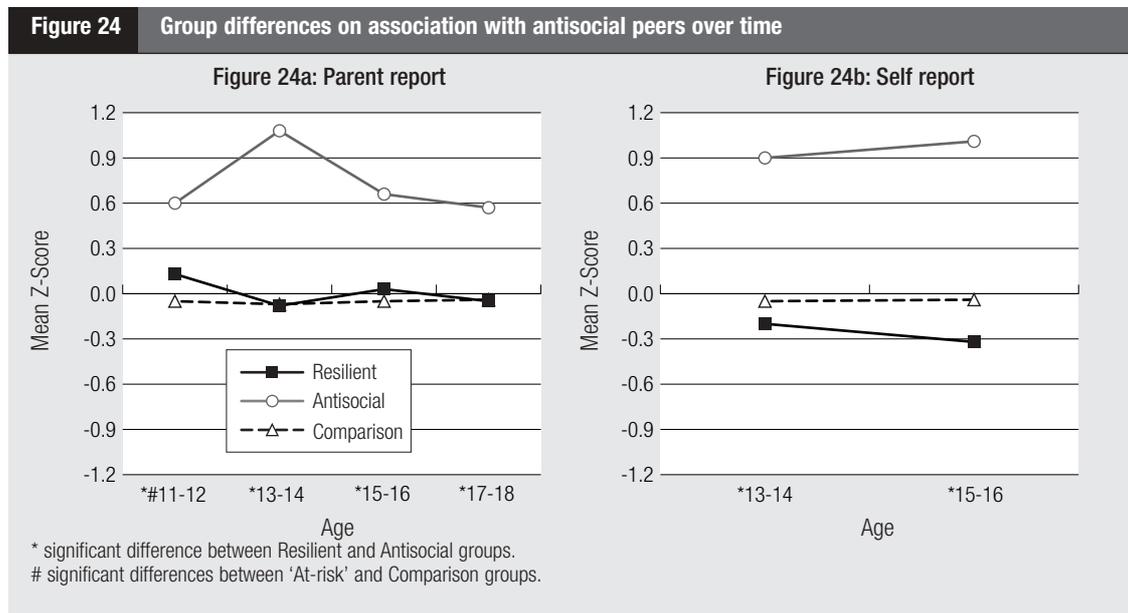


### Peer environment

The *Resilient* and *Antisocial* groups significantly differed in the type of peers they associated with (see Figure 24). Based on their own and their parents' reports, participants in the *Resilient* group were consistently less likely to socialise with peers who engaged in antisocial behaviour than were *Antisocial* participants. On the other hand, individuals in the *Antisocial* group were consistently less likely to engage in structured peer group activities (e.g sporting clubs, church groups) than adolescents in the *Comparison* group, with rates of involvement below that of the *Resilient* group (refer to Figure 25).

During late childhood (11-12 years), the *Resilient* and *Antisocial* groups reported poorer quality peer relationships than the *Comparison* group. Children in both these groups interacted less frequently with their peers (by parent-report), and viewed their peer relationships more negatively than *Comparison* participants (by self-report). Furthermore, at 13-14 years, both 'at-risk' groups reported being less attached to their peers than the *Comparison* group. These difficulties were more pronounced among the *Resilient* group, who had also reported more negative, and fewer positive, aspects to their friendships than other participants, during late childhood.

However, while levels of peer involvement increased among the *Antisocial* group over adolescence, there was little change in levels of peer involvement among the *Resilient* group, who remained well below the *Antisocial* and *Comparison* groups on this characteristic (see Figure 26). In addition, the *Resilient* group continued to rate their peer relationships more negatively than the *Comparison* group throughout adolescence (e.g. poorer friendship quality at 13-14 and 15-16 years, lower peer attachment, communication and trust at 17-18 years).



## Discussion and implications

There were no characteristics that clearly differentiated the *Resilient* group from the *Antisocial* group prior to 11-12 years. Both groups were very similar to each other, and more problematic than the *Comparison* group during infancy and childhood. This supports the conclusion that they were equally 'at risk' at 11-12 years, and appeared to be on similar developmental pathways. However, there was a marked change in the *Resilient* group over the early adolescent years, which continued throughout adolescence. This change was so large that by the age of 17-18 years, the *Resilient* group resembled the *Comparison* group on many characteristics.

The characteristics that differentiated the *Resilient* group from the *Antisocial* group during adolescence were numerous, and included personal attributes and characteristics of the family, school and peer environments. When compared to the *Antisocial* Group during adolescence, the *Resilient* group was typically:

#### *Personal Attributes*

- less 'difficult' temperamentally
- less aggressive, hyperactive and depressed
- more cooperative and self-controlled
- less assertive
- less attracted to thrill-seeking and adventurous activities

#### *Characteristics of the Family Environment*

- had a more positive parent-child relationship
- received more parental supervision
- received less harsh punishment from parents

#### *Characteristics of the School Environment*

- had higher school adjustment and bonding

#### *Characteristics of the Peer Environment*

- had fewer antisocial peer friendships
- had less peer involvement
- had less positive peer relationships

The major characteristic that consistently differentiated the two 'at-risk' groups prior to adolescence was association with antisocial peers. From late childhood, the *Antisocial* group was found to socialise more frequently with antisocial peers than both the *Resilient* and *Comparison* groups. These findings suggest that peer influences were very potent and evident early.

It was also noticeable that the *Resilient* (but not the *Antisocial*) group consistently exhibited a less gregarious personal style than the *Comparison* group (e.g. they were less assertive, less involved with their peers, and not as closely bonded to their friends). While unexpected, this finding appears to suggest that the *Resilient* group's more reserved style may have protected them from becoming persistently antisocial during adolescence. This finding is further discussed below.

Consistent differences in parental supervision (higher among the *Resilient* and *Comparison* groups) and sensation seeking (higher among the *Antisocial* group) were also found during adolescence. These findings suggest that both parenting practices and individual characteristics are important. Given the strength and consistency of these findings it appears likely that the characteristics described above (i.e. high parental supervision, lower peer involvement, low sensation seeking) protected *Resilient* individuals from engaging in antisocial behaviour. However, with the exception of antisocial peer friendships, many of these characteristics were not measured until adolescence, so it is not possible to say whether these differences were responsible for the change in the group trajectories, or the result of other changes among the *Resilient* group over the early adolescent years.

These findings have a number of important implications for crime prevention theory and practical interventions:

### **1. *Developmental pathways can change over the late childhood to early adolescent period, so intervention may still be successful at this age***

One of the key findings of these analyses is that the two 'at-risk' groups were virtually indistinguishable until adolescence, when a change occurred in their trajectories. This finding has important implications for intervention strategies aimed at preventing adolescent antisocial behaviour as it suggests that individuals whose personal characteristics place them 'at risk' of developing adolescent antisocial behaviour are still amenable to change during late childhood and early adolescence. These findings are consistent with the conclusions of Loeber and Farrington (1998) who, on the basis of their comprehensive review of the literature on serious and violent juvenile offenders, concluded that 'it is never too early, never too late' to intervene in pathways to antisocial behaviour.

It will be important to continue following the progress of the *Resilient* group over the coming years to determine whether these individuals have longer-term negative outcomes. Moffitt and colleagues have recently reported that only 15 per cent of their so-called 'recovery' group (boys who had been aggressive as children but were not persistently delinquent in adolescence) actually had recovered (Moffitt, Caspi, Harrington, & Milne, 2002). By 26 years of age, over a quarter had been convicted of an offence in adulthood, and many were anxious, depressed and socially isolated. Given the seemingly large improvement of the *Resilient* group in our study, we are hopeful that these improvements will be maintained over adulthood. However, bearing in mind the *Resilient* group's consistently higher rate of peer relationship difficulties in childhood and adolescence, it is possible that they will be more prone to the social adjustment difficulties in adulthood noted by Moffitt and colleagues.

## **2. Early adolescence appears to be a crucial transition time and cross-road in pathways to adolescent antisocial behaviour among 'at-risk' young people**

The early adolescent years appear to be an important transition point in the progression to antisocial behaviour. Between the ages of 12-13 and 13-14 years, clear differences between the *Resilient* and *Antisocial* groups emerged. While the *Antisocial* group continued to exhibit difficulties across a wide range of domains, the *Resilient* group began to show signs of improvement in many areas of their life at this time, becoming more like the *Comparison* group in many domains.

While it is beyond the capacity of our study to fully explain why the two groups began to differ during early adolescence, it is interesting to note that this divergence in pathways coincides with the transition from primary to secondary school. Although our study is unable to shed light on the processes involved, one possibility is that the change in school environment enabled some 'at-risk' individuals to leave behind their reputations or self images as 'troublemakers' and make a 'new start', while for others, the challenges of their new environment may have further exacerbated their difficulties. It is also possible that this transition may have resulted in a change of peer groups for some, which may have impacted on their subsequent behaviour.

Factors associated with the transition to adolescence may have also contributed to the change in trajectories of the two groups' pathways. The early adolescent years are typically a time of great cognitive, emotional and physical change. At this time, the onset of puberty occurs, and young people also become increasingly capable of complex cognitive processes (e.g. thinking abstractly and logically, monitoring their own emotional responses). These changes can have a significant impact on individuals' views of themselves and their interpersonal relationships. Hence, it is possible that developmental factors associated with the transition from childhood to adolescence may have contributed to the alteration in the trajectories of the two 'at-risk' groups. Changes in levels of task-persistence, negative reactivity and self-control suggest that self-regulation capacities matured at this age in the *Resilient* group but may have remained underdeveloped or slower to mature in the *Antisocial* group.

These findings highlight the importance of the early adolescent years for the development of antisocial behaviour. Further research focusing on the early adolescent years is needed to clarify the features of this developmental period which may have brought about the divergence in developmental pathways of the two 'at-risk' groups at this time.

## **3. Changes in temperament can occur**

Some consider temperament characteristics to be permanent, and hence, not amenable to change. The present findings challenge this belief by suggesting that changes in temperament are possible. For example, while the two 'at-risk' groups were consistently rated as more volatile and less task persistent than the *Comparison* group during childhood, there was a marked improvement among the *Resilient* group on these characteristics over adolescence. These findings are consistent with previous research, which suggest that temperament traits are not immutable, and are moderately stable over time (Sanson, Hemphill & Smart, 2002).

At present, the reasons underlying changes in temperament are not well understood (Sanson et al., 2002). Hence, we can only speculate as to why the *Resilient* group improved so dramatically during adolescence. One possibility is that environmental changes, such as the transition to a new school environment, and/or the improvement in parent-child relationships, may have contributed to this improvement in the *Resilient* group at this time. It has been argued that temperament exerts its effects on children's development through its 'goodness of fit' with their environment (Thomas & Chess, 1977). According to this view, a good match between a child's temperament and the demands of his/her environment promotes healthy development, while a mismatch may hinder development (Sanson et al., 2002). Hence, it is possible that environmental changes during early adolescence may have resulted in a better temperament-environment 'fit' for some 'at-risk' individuals, thus leading to an improvement in the *Resilient* group at this time.

Another possibility is that a developing capacity for higher self-regulation among the *Resilient* group may have enabled some 'at-risk' individuals to manage their temperamental proclivities more effectively than other vulnerable young people. Support for this hypothesis can be found in the observation that individuals in the *Resilient* and *Comparison* groups reported higher levels of emotional control than the *Antisocial* group during late adolescence.

These findings offer hope to parents, teachers, professionals and policy makers as they suggest that individuals who display 'difficult' temperament characteristics during childhood do not necessarily become 'problem' adolescents. Temperamental change, or improvements in the way temperamental proclivities are managed, are possible. The same can be said for behaviour problems. Further research is needed to better understand the mechanisms underlying these changes.

## **4. The role of peer relationships in preventing the development of persistent adolescent antisocial behaviour**

The current findings suggest that peer relationships play a very important role in preventing vulnerable individuals from engaging in persistent adolescent antisocial behaviour. As noted earlier, prior to adolescence, the only characteristic that consistently differentiated the *Antisocial* group from the *Resilient* group was their tendency to associate more frequently with peers who engaged in antisocial acts. Since this difference was evident before the group trajectories diverged, it is possible that the *Resilient* group's lower involvement with antisocial peers may have protected them from later developing persistent antisocial behaviour.

Given that frequent association with antisocial peers was identified as one of the most powerful predictors of adolescent antisocial behaviour in the First Report and is consistently identified as a strong risk factor for antisocial behaviour in other research (see Elliott & Menard, 1996; Patterson et al., 1992; Weatherburn & Lind, 2001), it is not surprising that a low rate of such friendships appears to have a protective effect.

These findings have implications for the delivery of intervention and prevention programs, particularly in relation to the use of group programs (e.g. group counselling sessions, guided group interaction) with antisocial youth. While these interventions may be effective in addressing certain behavioural or emotional problems (e.g. depression), research is accumulating which suggests that programs that bring antisocial adolescents together may be counter-productive as they can result in increases in antisocial behaviour (e.g. delinquency, substance use and violence) and adult maladjustment, as suggested by some studies (Dishion, McCord & Poulin, 1999). Hence, research suggests that alternative intervention strategies (e.g. parent-focused interventions) may be more effective with antisocial youth (Dishion et al., 1999).

A number of other, less expected peer-related characteristics were also associated with resilience against persistent adolescent antisocial behaviour. During adolescence, the *Resilient* group were generally less involved with their peers and perceived their peer relationships more negatively than their *Antisocial* and *Comparison* counterparts. Furthermore, the *Resilient* group was consistently rated by parents as less assertive than individuals in both the remaining groups. Hence, it is possible that the more reserved personal style of the *Resilient* group may have impeded their progression to more serious and long-term behaviour problems, although further research is needed to understand the processes involved.

These findings highlight the importance of parents and teachers being aware of a young person's friendship group and the type of activities they are engaging in, as the development of friendships with antisocial peers appears to increase the risk of persistent adolescent antisocial behaviour among vulnerable individuals. However, this does not mean that unreasonably severe practices such as 'grounding' children are likely to be effective in discouraging young people from socialising with antisocial peers. Rather, parents could assist young people to develop more positive peer relationships by encouraging them to join clubs or engage in other structured peer group activities.

##### **5. The importance of parenting and the family environment in aiding resilience against persistent adolescent antisocial behaviour**

The findings suggest that certain aspects of parenting may play an important role in preventing vulnerable individuals from developing adolescent antisocial behaviour. For example, parents of *Resilient* children consistently reported supervising their child's activities to a much higher extent than parents of *Antisocial* children, with levels of supervision similar to those of the *Comparison* group. Furthermore, while parents of both 'at-risk' groups reported using harsh discipline techniques to a greater extent than parents of *Comparison* individuals (perhaps as a way of controlling their adolescents), there was a significant decrease in the use of this strategy among parents of *Resilient* individuals by midadolescence.

As previously mentioned, it is not possible to determine whether the three groups differed in the quality of parenting they received during childhood, as measures of parenting styles were not obtained at this time. Nevertheless, the strength and consistency of group differences on parenting supervision during adolescence suggest that the higher parental supervision received by the *Resilient* group may have played an important role in preventing this group from engaging in adolescent antisocial behaviour. The decrease in use of harsh discipline with the *Resilient* group may have also contributed to their resilience against antisocial behaviour. However, it is also possible that these changes may be a response to the improvement in the *Resilient* group. That is, the more controlled behaviour of the *Resilient* group may have facilitated parents' ability to supervise their activities and may have been responsible for a decrease in the use of harsh discipline with this group.

Other parent-related factors associated with the change in the *Resilient* group included an improvement in the quality of the parent-child relationship and an increase in the level of warmth experienced in these relationships. Once again, it is difficult to determine whether these changes contributed to the improvement in the *Resilient* group, or occurred as a result of the improved behaviour of this group. All the same, these findings suggest that while it may be difficult to maintain positive relationships with children who are 'difficult' and 'act out' it nevertheless is critical to do so. Other aspects of parenting not directly measured by this study (e.g. choice of schools, encouraging involvement in extracurricular activities) are also likely to be important.

Factors associated with the family environment also appeared to play an important role in influencing whether vulnerable individuals later developed antisocial behaviour. Participants in the *Resilient* group were more likely to belong to an 'intact' family unit and their parents reported a more optimal family environment than parents of *Antisocial* children, reporting a higher sense of family unity, lower levels of marital conflict and lower levels of family stress.

Taken together, these findings suggest that families, and in particular parents, can play an important role in assisting 'problematic' young people to move off harmful developmental pathways. Given these findings, intervention programs aimed at improving relationships between 'at-risk' children and their parents, and helping parents to more effectively understand and manage their children's behaviour, would appear highly worthwhile, as they may assist children to move onto more positive pathways.

## 6. *The influence of school attachment and adjustment*

Consistent with many other studies that have identified characteristics that promote resilience against the development of antisocial behaviour, the findings of this research emphasise the importance of school bonding and school achievement (e.g. Bond, Thomas, Toumbourou, Patton & Catalano, 2000; Farrington & Loeber, 1998; O'Donnell, Hawkins & Abbott, 1995). While the *Resilient* group exhibited some school adjustment difficulties, they experienced significantly fewer difficulties than the *Antisocial* group over the secondary school years. Furthermore, the *Resilient* group reported feeling more attached to school, and had more positive attitudes to schooling than their *Antisocial* counterparts.

These findings underscore the positive role that schools (and possibly, a trusted or liked teacher or other adult figure) can play in shaping the psychosocial development of young people. They suggest that if a 'problematic' individual experiences a sense of attachment to their school (including their teachers), feels comfortable with the routines and demands that are expected, and values their school experiences, this may assist them to avoid engaging in antisocial and/or illegal activities. Hence, interventions aimed at improving adjustment to school (both how an individual adjusts to the routines and demands of school-life and how the school accommodates the child's characteristics and needs) among vulnerable individuals would appear highly beneficial.

## 7. *Pathways to adolescent antisocial behaviour are diverse and complex*

Importantly, most children identified as being 'at-risk' of developing persistent adolescent antisocial behaviour did not become persistently antisocial. Thus, of the children who were identified as 'at risk', about one in ten were later persistently antisocial during adolescence, close to half showed signs of antisocial behaviour in adolescence (the 'other outcomes' group), and about 40 per cent never exhibited antisocial behaviour. These findings are promising, as they suggest that a large number of individuals who display 'difficult' personal characteristics do not go on to engage in persistent adolescent antisocial behaviour. A range of environmental factors, such as peer, family and school experiences, appear to be important in determining whether a progression to antisocial behaviour is made. These findings also serve as a reminder that while risk factors increase the likelihood of an adverse outcome, they do not determine it. Thus, caution needs to be exercised in using the label 'at risk'.

It was also noteworthy that approximately a third of individuals who engaged in persistent adolescent antisocial behaviour were not identified as being 'at-risk' at 11-12 years. It was not possible to predict these young people's involvement in later antisocial behaviour from their earlier developmental histories, suggesting that for this group too, there may have been a change in pathways.

Taken together, these findings suggest that the pathways to adolescent antisocial behaviour are diverse and complex, and that a wide range of personal, environmental and situational factors may influence an individual's progression along particular pathways. Further research is needed to identify the mechanisms and processes which facilitate or impede the development of adolescent antisocial behaviour.

**In conclusion**, this research has identified two distinct pathways 'at-risk' individuals may traverse in relation to adolescent antisocial behaviour: an *Antisocial* pathway (leading to high levels of adolescent antisocial behaviour); and a *Resilient* pathway (resulting in little or no antisocial behaviour during adolescence). The *Resilient* pathway was more common than the *Antisocial* pathway, using our criteria.

Comparison of these two 'at-risk' groups with the remainder of the ATP sample (the *Comparison* group) revealed that participants in the *Antisocial* and *Resilient* groups were consistently more problematic than the *Comparison* group over a range of domains during toddlerhood and childhood. However, during early adolescence a notable change in these trajectories occurred.

While it is not within the capabilities of the present research to fully explain why the pathways of the 'at-risk' groups diverged in early adolescence, these findings offer valuable guidance as to where future research and intervention strategies should be directed. For example, they suggest that the early adolescent years are a key time period in the development of adolescent antisocial behaviour, or in resilience to it. Hence, research and interventions targeting this time period would appear highly beneficial. Such research would help us to better understand the factors or processes associated with this time period that may prevent some vulnerable young people from engaging in antisocial behaviour, which in turn may be used to inform intervention programs. These findings serve as a timely reminder that early intervention does not have to mean intervention very early in childhood.

Consistent with other studies on resilience, the present research identified a relatively small number of protective factors. The strongest of these was low involvement with antisocial peers; however, a number of individual attributes (lower sensation seeking, lower assertiveness), peer characteristics (lower peer involvement, poorer relationship quality), and familial characteristics (higher parental supervision) also appeared to have a protective effect. It is interesting to note that the opposite poles of some of these protective factors (e.g. high association with antisocial peers, low parental

supervision) have previously been identified as risks for persistent adolescent antisocial behaviour within the ATP sample (see Vassallo et al., 2002).

Taken together, these findings offer strong support for many of the current theories of antisocial behaviour, which propose that environmental factors play an important role in spurring a vulnerable individual to engage in antisocial behaviour (for example, Elliott & Menard, 1996; Weatherburn & Lind, 2001). Given that environmental factors are often amenable to change, these findings have exciting implications for intervention efforts, as they suggest that interventions aimed at enhancing familial relationships (particularly those between parents and children), discouraging detrimental peer relationships and fostering school attachment, may divert young people from traversing an antisocial pathway in adolescence. Furthermore, interventions aimed at assisting young people to better manage their behavioural and emotional responses would appear highly beneficial. The home, school and wider environment (e.g. community groups, sporting clubs) may all act as sites for change, by supporting 'at-risk' children.

## 4 *Location effects on adolescent antisocial behaviour*

The variation in crime rates between different localities and neighbourhoods has been the focus of considerable theoretical and empirical research attention over the past few decades (Carach, 2001; Sampson, 2002). Both Australian and international studies have shown that a small number of communities or localities often account for a disproportionate amount of crime, as measured by police statistics (Vinson, 1999; Weatherburn & Lind, 1998). Weatherburn & Lind (1998) observed that almost half of 10-17 year olds living within the most disadvantaged postcode in New South Wales appeared before a Children's Court at least once over a five year period, while Vinson (1999) found that the 30 most disadvantaged postcodes within Victoria accounted for twice their share of court defendants.

Crime-prone neighbourhoods are often characterised by high levels of social and economic disadvantage. High unemployment rates (Carcach, 2001; Vinson, 1999; Weatherburn and Lind, 1998, 2001), low income levels (Kramer, 2000; Krivo & Peterson, 1996; Vinson, 1999; Weatherburn & Lind, 1998, 2001), high income inequality (Carcach, 2001; Kramer, 2000), high residential mobility (Carcach, 2001), a high proportion of lone-parent families (Bennett & Fraser, 2000), and low social capital (Bennett & Fraser, 2000, Carcach & Huntley, 2002) are some of the characteristics that have been associated with high crime areas.

While there is a general consensus that there is an association between area characteristics and official crime rates, the manner in which the local context impacts on an individual's propensity to engage in antisocial and/or criminal acts is not well understood. One early influential view was that area characteristics such as poverty and high unemployment directly impacted on antisocial behaviour by motivating individuals to offend in order to escape their disadvantaged circumstances (Merton, 1957). However, the fact that the peak age for offending occurs prior to entry into the workforce, and that not all crime in disadvantaged areas is property-related, clearly conflict with this view (Weatherburn & Lind, 1998).

More recent research suggests that neighbourhood characteristics such as socio-economic disadvantage may exert their effects on antisocial behaviour in a more indirect manner, for instance, by interfering with parents' ability to appropriately discipline, supervise and/or nurture their children (Barrera et al., 2002; Scaramella, Conger, Spoth, & Simons 2002; Weatherburn & Lind 1998). Thus, this research suggests that parenting mediates the impact of neighbourhood disadvantage on adolescent antisocial outcomes.

According to Weatherburn and Lind's model of delinquency (1998, 2001), 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. According to this model, the effects of economic stress on parenting behaviour 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, a crowded household, large family, 'difficult child', family conflict, parental disorder). Furthermore, the likelihood that an 'at-risk' child will engage in antisocial or illegal activities is thought to increase if the child lives in a community in which there are a large number of offenders. The direct impact of community characteristics may therefore be quite small.

Much of the research in this field is based on population-level data in which localities with characteristics such as high unemployment or high rates of lone parenthood are compared to more advantaged areas on indicators of antisocial behaviour (e.g. crime rates as measured by police statistics). It is important to determine whether the effects found are at the level of locality or at the level of the family. Children can grow up in disadvantaged communities but receive high quality parenting, while others in advantaged communities can live in disrupted, dysfunctional families. Some studies have attempted to link population-level and individual-level data (e.g. Lynam, Caspi, Moffitt, Wikström, Loeber & Novak, 2000; Wikström & Loeber, 2000), but these studies have been conducted outside Australia and often focused on very disadvantaged localities; hence, their applicability to the Victorian context is uncertain.

The Australian Temperament Project (ATP), which comprises a large sample of Victorian families living in metropolitan, regional and rural settings, provides an opportunity to link population-level and individual-level data, and to investigate whether community-level effects can be detected if an individual-level approach is taken. This section reports findings concerning the impact of local characteristics on engagement in self-reported adolescent antisocial behaviour (which may be higher than official statistics), and whether locality effects are direct or indirect.

### **Methodology**

The present set of analyses are based on participants of the Australian Temperament Project (ATP) who were living in the state of Victoria, Australia, between the ages of 13 and 18 years (1996 and 2000). This timeframe was selected as it coincides with the time points at which self-reports of antisocial behaviour were obtained.

Only ATP participants living within Victoria were included, as the dataset used to measure locality characteristics, the Crime Prevention Victoria – Victoria University database (Armstrong, Francis, Bourne & Dussuyer, 2002), only contains Victorian data. Of the ATP participants who lived outside Victoria, the majority resided in New South Wales (n=48) and Queensland (n=41), with small numbers residing in Western Australia (n=10), South Australia (n=7), Tasmania (n=3), the Australian Capital Territory (n=1) and the Northern Territory (n=1), while one lived outside Australia.

The final sample comprised 970 participants, approximately half of whom were male (49.5 per cent).

The area characteristics included in the current analyses originated from the Crime Prevention Victoria – Victoria University (CPV-VU) database, a special purpose database developed to contain Victorian community characteristics relevant to Crime Prevention Victoria initiatives. The Crime Prevention Victoria – Victoria University (CPV-VU) database is the product of a collaborative Australian Research Council Linkage project between Crime Prevention Victoria and Victoria University, which aims to create a comprehensive collection of Victorian socioeconomic, demographic, community capacity, community perception and crime indicators.

Many measures contained in this database originate from the 1996 Australian Bureau of Statistics Census data (the 2001 Census data was not available at the time the database was constructed), however, the database also contains a number of more recent indicators (measured between 1999 and 2001).

Information regarding ATP participants' residential postcode location in the year 2000 (i.e. their postcode) was matched to the CPV-VU data. There was very limited locality movement among ATP families over the years 1996 to 2000 (participants' postcodes over the three time points correlated very highly<sup>10</sup>). Hence, the use of 2000 data as an indicator of local context during adolescence was considered valid. As the ATP dataset identifies families by ID number only, with no other identifying information included (e.g. names or postal address), the anonymity of participating adolescents and families was ensured.

Information for many indices in the CPV-VU database was available at the broad local government area (LGA) level rather than the more specific postcode level. Additionally, within the ATP sample there were only a small number of participants in some postcodes. Hence, LGA was selected as the unit of analysis for these analyses, LGAs are broad geographical areas that include all suburbs or localities that are within the responsibility of a local government council (Australian Bureau of Statistics, 2001). Table 7 shows the distribution of the ATP sample over the 78 Victorian LGAs in 2000.

As this table shows, the ATP sample was widely distributed across the state of Victoria, with participants residing in all but seven of the state's 78 LGAs. Almost two-thirds of participants (64.4 per cent) lived in metropolitan areas, 22.7 per cent in rural areas and 12.9 per cent in regional centres.

### **Data linking**

Information regarding the LGA in which a participant lived (from the CPV-VU database) was matched to the longitudinal data gathered for that participant (contained in the ATP dataset, and identifiable only by ID number). The particular local area characteristics selected for inclusion in subsequent analyses were chosen on the basis of past research which suggested that they were associated with antisocial behaviour (e.g. Bennet & Fraser, 2000; Vinson, 1999; Weatherburn & Lind, 1998, 2001). At the time the Australian Temperament Project statistical analyses were conducted, the local area measures used were the latest available (the 2001 census data was not available at the LGA level).

The location characteristics included were:

- Unemployment rates
- Average weekly income
- Recorded crime rates
- Growth rate
- Proportion of lone-parent families
- Relative socio-economic disadvantage (SEIFA)
- Economic resources
- Education and occupation

Appendix 5 provides further information on the source of these location characteristics.

All LGAs had previously been assigned a ranking between 1 and 78 for each of the eight characteristics described above. A ranking of '1' indicated that an LGA was the highest in the state on a particular characteristic (e.g. unemployment rates), while a ranking of '78' indicated that they were the lowest.

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<sup>10</sup> Correlations ranged from .88 (between 1996 and 2000) to .98 (between 1996 and 1998).

LGA	N	%	LGA	N	%	LGA	N	%
Alpine	4	0.4	Greater Shepparton	9	0.9	Murrindindi	6	0.6
Ararat	3	0.3	Hepburn	1	0.1	Nillumbik	25	2.6
Ballarat	37	3.8	Hindmarsh	1	0.1	Northern Grampians	6	0.6
Banyule	45	4.6	Hobsons Bay	15	1.5	Port Phillip	3	0.3
Bass Coast	6	0.6	Horsham	17	1.8	Pyrenees	10	1.0
Baw Baw	10	1.0	Hume	33	3.4	Queenscliffe	--	--
Bayside	8	0.8	Indigo	3	0.3	South Gippsland	30	3.1
Boroondara	20	2.1	Kingston	42	4.3	Southern Grampians	5	0.5
Brimbank	40	4.1	Knox	13	1.3	Stonnington	1	0.1
Buloke	--	--	La Trobe	3	0.3	Strathbogie	2	0.2
Campaspe	8	0.8	Loddon	12	1.2	Surf Coast	2	0.2
Cardinia	6	0.6	Macedon Ranges	13	1.3	Swan Hill	1	0.1
Casey	8	0.8	Manningham	47	4.9	Towong	--	--
Central Goldfields	--	--	Maroondah	34	3.5	Wangaratta	2	0.2
Colac-Otway	9	0.9	Maribyrnong	--	--	Warrnambool	3	0.3
Corangamite	7	0.7	Melbourne	--	--	Wellington	2	0.2
Darebin	2	0.2	Melton	4	0.4	West Wimmera	1	0.1
Delatite	6	0.6	Mildura	14	1.4	Whitehorse	9	0.9
East Gippsland	13	1.3	Mitchell	7	0.7	Whittlesea	5	0.5
Frankston	28	2.9	Moira	7	0.7	Wodonga	13	1.3
Gannawarra	7	0.7	Monash	37	3.8	Wyndham	5	0.5
Glen Eira	20	2.1	Moonee Valley	29	3.0	Yarra	4	0.4
Glenelg	--	--	Moorabool	4	0.4	Yarra Ranges	74	7.6
Golden Plains	3	0.3	Moreland	38	3.9	Yarriambiack	4	0.4
Greater Bendigo	8	0.8	Mornington Peninsula	27	2.8	Unincorporated Vic	2	0.2
Greater Dandenong	3	0.3	Mount Alexander	2	0.2			
Greater Geelong	38	3.9	Moyne	4	0.4			

LGAs that were ranked among the most disadvantaged<sup>11</sup> 20 per cent in the state on a particular characteristic (e.g. the top 20 per cent on socio-economic disadvantage, the bottom 20 per cent on education and occupation) were classified as 'disadvantaged' on this aspect. The remaining 80 per cent of LGAs were labelled as 'not disadvantaged' on this characteristic. Table 8 displays the proportion of ATP participants who resided in LGAs which were classed as 'disadvantaged' on a particular characteristic.

As Table 8 shows, there was considerable variation in the proportion of ATP participants living in areas defined as 'disadvantaged' on specific characteristics. For example, while less than ten per cent of participants were classified as living in a low income area, approximately a third of participants lived in areas which were in the most problematic 20 per cent of the State on crime. These findings are interesting as they indicate that LGAs which were 'disadvantaged' on one characteristic were not necessarily

Characteristics of LGA	N	%
High Crime	405	33.9
High Unemployment	191	16.0
Low Income	105	8.8
High Growth	158	13.2
High Lone-Parent Families	219	18.3
High Socio-Economic Disadvantage	217	18.2
Low Economic Resources	187	15.7
Low Education and Occupation	181	15.2

<sup>11</sup> While not ideal, the term 'disadvantaged' was chosen to describe the area indicators used (e.g. high unemployment, low income levels). We acknowledge that this term does not apply to high growth areas, however, in the absence of a better term, which would suitably describe all eight characteristics, this term will be used throughout the remainder of the chapter.

the lowest on others. Hence, given the apparent independence of these characteristics, it seemed appropriate initially to examine the effects of each of the eight local area characteristics on adolescent antisocial behaviour separately.

## Findings

### Direct effects

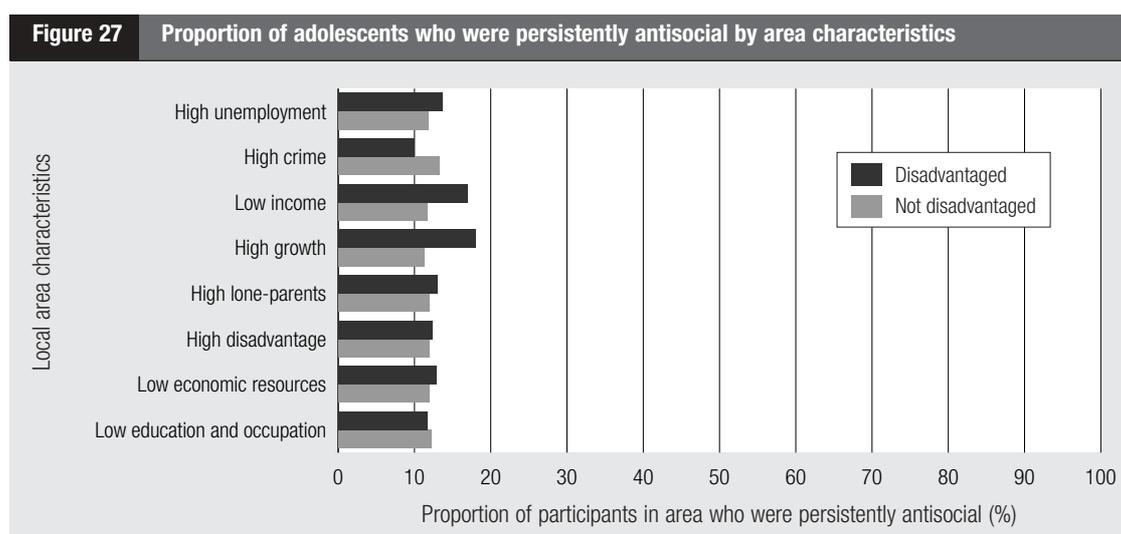
To determine whether local area characteristics were associated with engagement in antisocial behaviour, two sets of analyses were conducted. The first involved an examination of rates of experimental, persistent and low/non antisocial behaviour among ATP participants from the various geographic areas. The second consisted of an examination of the relationship between geographical location and reported contact with the criminal justice system.

### Patterns of antisocial behaviour by area characteristics

As described previously, (see also Vassallo, et al., 2002), three groups of adolescents displaying different patterns of antisocial behaviour have been identified: a *Persistent* antisocial group, an *Experimental* antisocial group and a *Low/non* antisocial group.

Each indicator of location characteristics was examined in turn, to investigate whether there were any associations between the specific characteristic and differing patterns of adolescent antisocial behaviour. The frequency of *Low/non*, *Experimental* or *Persistent* antisocial behaviour was found to be similar among ATP adolescents living in 'disadvantaged' areas (e.g. high unemployment or low income) and 'non-disadvantaged' areas.

This finding is illustrated by Figure 27, which shows the rates of persistent antisocial behaviour among adolescents living in locations that were, or were not, disadvantaged on the selected indicators. The figure shows that rates of persistent antisocial behaviour were similar among individuals living in both types of localities. There was a trend for higher numbers of persistently antisocial adolescents to live in areas that were low income or high growth, but it was not significant.



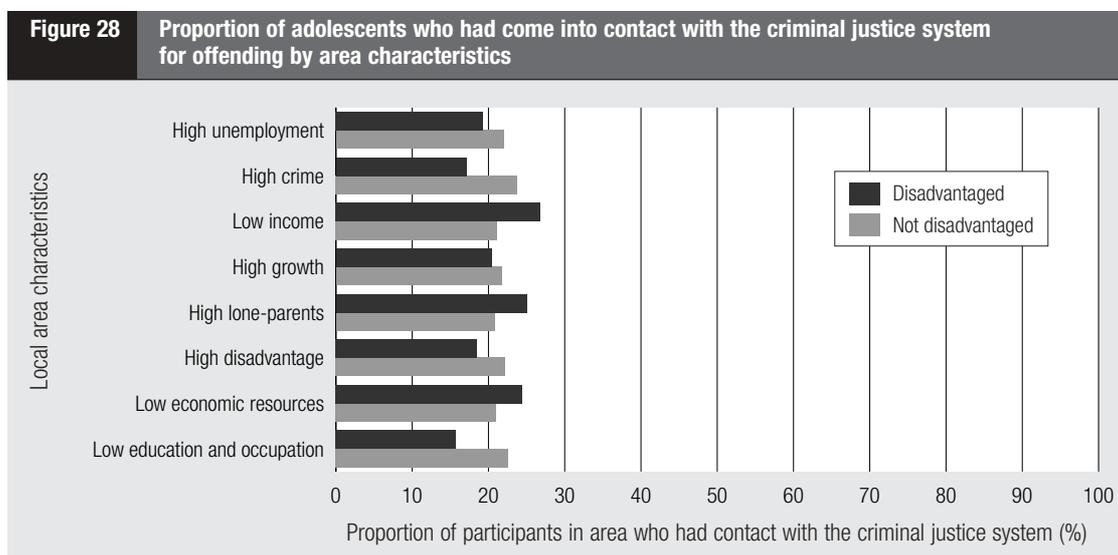
To further explore associations between area characteristics and rates of antisocial behaviour, a cumulative disadvantage index was developed using the eight indicators listed previously in Table 8. A total disadvantage score was calculated for each participant by summing the number of disadvantaged locality characteristics for the area in which he/she lived. This resulted in a possible score between 0 and 8. Table 9 shows the rates of total disadvantage among individuals in the *Persistent*, *Experimental* and *Low/non Antisocial* groups. No significant differences were found between the groups in rates of total disadvantage ( $\text{Chi}^2(8) = 7.41$ ;  $p = .493$ ).

**Table 9** Total disadvantage index: Percentage and number (in brackets) of risks among adolescents who exhibited Persistent, Experimental and Low/non antisocial behaviour

Group	Total disadvantage score						
	0	1	2	3	4	5	6
Persistent	36% (35)	23% (22)	12% (12)	23% (22)	2% (2)	4% (4)	0% (0)
Experimental	33% (24)	33% (24)	18% (13)	10% (7)	0% (0)	4% (3)	1% (1)
Low/non antisocial	34% (218)	28% (178)	13% (81)	19% (123)	2% (13)	3% (16)	1% (4)

### Contact with the criminal justice system for offending by area type

The proportion of participants living in each area type who reported contact with the criminal justice system during adolescence was next examined. Contact with the criminal justice system was defined as the self-report of contact with the system as an offender between the ages of 13 and 18 years (1996 and 2000)<sup>12</sup>. Since only a relatively small number of participants reported having been in contact with the criminal justice system (n=189), it was not possible to undertake more detailed analyses about the specific nature of the contact or offence. The results of these comparisons are presented in Figure 28.



On only one locality characteristic (crime rates) was there a significant association between rates of contact with the criminal justice system and area disadvantage. Somewhat surprisingly, young people living in high crime areas tended to have had less contact with the criminal justice system than participants living in other areas (17.1 per cent compared with 23.8 per cent). It is difficult to explain this finding, but several explanations can be suggested. For example, it is possible that in high crime areas, the high demand on police time and resources in these areas may result in adolescents who self-report antisocial behaviour not being reported and apprehended by police. It is also possible that individuals who commit offences in high crime areas do not actually live in these areas. Alternatively, given that almost a third of our sample lived in areas classified as 'high crime' areas, it is possible that the cut-off set for 'high crime' was not powerful enough to identify differences. It should also be noted that this trend, while significant, was not large (5 percentage points difference).

### Urban – rural location

The CPV-VU database also classified LGAs into metropolitan, regional and rural locations. This classification was used to explore possible variation in rates of *Persistent*, *Experimental*, or *Low/non* adolescent antisocial behaviour across the different types of localities. Table 10 below displays the rates found, and shows that there were no significant differences in rates of adolescent antisocial behaviour among youth from the three types of locations ( $\chi^2(4) = 6.64; p = .156$ ).

Group	Metropolitan area	Regional Centre	Rural area
Persistent	11% (58)	17% (19)	11% (20)
Experimental	10% (51)	9% (10)	6% (11)
Low/non Antisocial	79% (397)	73% (80)	83% (156)

### Indirect effects

#### Socio-economic disadvantage

As previously noted, a number of recent theories (Barrera et al., 2002; Scaramella, et al., 2002; Weatherburn & Lind, 1998) have suggested that socio-economic disadvantage exerts its influence on engagement in antisocial behaviour indirectly, by impacting on and disrupting parenting practices. This hypothesis is next explored in relation to persistent adolescent antisocial

<sup>12</sup> This contact may have involved coming into contact with police regarding an offence, being charged for an offence, appearing in court as an offender or being convicted of an offence.

behaviour. As only a small number of participants in the ATP sample were persistently antisocial during adolescence, it was decided to adopt a descriptive approach rather than a more complex statistical approach which would require a larger sample size for meaningful results. Factors such as social stress, parenting practices and association with antisocial peers were included in the analyses to determine whether they mediated the relationship between location characteristics and adolescent antisocial behaviour.

'Tree' diagrams were used to examine whether the cumulative risk of an individual engaging in persistent antisocial behaviour increased if he or she possessed each of the three mediating characteristics and lived in a highly disadvantaged area. That is, the data were examined to determine whether level of risk for antisocial behaviour was higher if an individual lived in a low income area (an indicator of economic stress), and belonged to a non-intact family (an indicator of low parental social support), and/or received low levels of parental supervision (an indicator of disrupted parenting processes) and/or frequently associated with antisocial peers.

To be classified as belonging to a non-intact family, participants must have experienced the death of a parent or a breakdown in the parental marital relationship during their lifetime. Participants must have been in the lowest 20 per cent of the ATP distribution on parental supervision and the highest 20 per cent on association with antisocial peers during adolescence to be classified as receiving low supervision and high association with antisocial peers, respectively. Three different measures of area socio-economic status were utilised: (i) the Australian Bureau of Statistic's SEIFA Index of Relative Disadvantage, (ii) average weekly income figures, and (iii) unemployment rates. As previously described, the lowest 20 per cent of LGAs in the State was classified as disadvantaged.

Figures 29 to 31 explore the additive effects of socio-economic factors, family structure, parental supervision and association with antisocial peers on propensity to engage in persistent adolescent antisocial behaviour.

As a guide to interpreting these figures, each 'branch' represents a different combination of characteristics a participant may possess. For example, in Figure 29, branch B represents those participants who lived in a low income area and belonged to a non-intact family and did not receive low parental supervision and frequently associated with antisocial peers; i.e. they possessed socio-economic disadvantage and two of three possible mediators. If a branch does not include all four variables (as is the case with branch A) this indicates that there were insufficient or no ATP participants who possessed this combination of characteristics; hence it was not possible to investigate this complete trajectory.

Numbers preceded by the statement 'N=' indicate the total number of ATP participants who possessed this characteristic or combination of characteristics. For example, looking at branch A, 65 participants lived in low income areas, while only 19 lived in a low income area and belonged to a non-intact family.

Numbers in bold font show the *percentage* of participants exhibiting these characteristics who became **persistently antisocial**. For example, 16.9 per cent of participants who lived in low income areas became persistently antisocial, whereas 15.8 per cent of those who lived in a low income area and belonged to a non-intact family became persistently antisocial (Branch A). The numbers in brackets next to those in bold indicate the *number* of ATP participants possessing these characteristics who engaged in persistent adolescent antisocial behaviour.

Figures 29 and 30 show that low levels of income and high levels of socioeconomic disadvantage did not add explanatory power beyond that explained by family structure, parental supervision and association with antisocial peers. For example, while a higher proportion of ATP participants living in low income areas became persistently antisocial than those living in more affluent areas (16.9 per cent compared with 11.7 per cent), when family structure and parental supervision were also taken into account, rates of *persistent* antisocial behaviour tended to be lower among those who lived in low income areas than those who resided in other areas (see Figure 31).

For example:

- Low income + non-intact family + low parental supervision = 0.0 per cent persistently antisocial
- Other areas + non-intact family + low parental supervision = **22.6 per cent** persistently antisocial

Likewise, rates of *persistent* antisocial behaviour were similar among adolescents living in areas of high socio-economic disadvantage (12.3 per cent) and those living in other areas (12.0 per cent). However, a slightly lower proportion of individuals who lived in areas of high socio-economic disadvantage, belonged to a non-intact family, and received low levels of parental supervision, were *persistently antisocial* than those who were residing in other areas who also possessed these family characteristics (see Figure 30).

For example:

- Socioeconomic Disadvantage + non-intact family + low parental supervision = 16.7 per cent persistently antisocial
- Other areas + non-intact family + low parental supervision = **20.7 per cent** persistently antisocial

However, it should be noted that very few ATP participants resided in a 'disadvantaged' location (e.g. high socio-economic disadvantage, low income, or high unemployment) and possessed several additional problematic characteristics. For example, only 6 ATP participants lived in areas of high socio-economic disadvantage and belonged to a non-intact family and received low parental supervision. Thus, the statistical power to detect such influences was quite limited.

Interestingly, there was a modest trend for additive risk in areas of high unemployment (see Figure 31).

For example:

- High unemployment + non-intact family + low parental supervision = **25.0 per cent** persistently antisocial
- Other areas + non-intact family + low parental supervision = 19.4 per cent persistently antisocial

**Figure 29** Indirect effects of low income on Persistent adolescent antisocial behaviour

LOW INCOME	NON-INTACT FAMILY	LOW PARENTAL SUPERVISION		HIGH ANTISOCIAL PEERS	
		YES N	NO N	YES N	NO N
YES N=65 16.9% (11)	YES N=19 15.8% (3)	YES N=4	0.0% (0)	YES N=3	66.7% (2) <b>A</b>
		NO N=15	20.0% (3)	NO N=12	8.3% (1)
	NO N=46 17.4% (8)	YES N=9	33.3% (3)	YES N=2	50.0% (1)
		NO N=37	13.5% (5)	NO N=7	28.6% (2)
NO N=737 11.7% (86)	YES N=153 17.6% (27)	YES N=31	22.6% (7)	YES N=11	63.6% (7)
		NO N=122	16.4% (20)	NO N=20	0.0% (0)
	NO N=575 9.9% (57)	YES N=112	7.1% (8)	YES N=26	34.6% (9)
		NO N=463	10.6% (49)	NO N=96	11.5% (11)
			YES N=12	25.0% (3)	
			NO N=97	5.2% (5)	
			YES N=74	41.9% (31)	
			NO N=384	4.2% (16)	

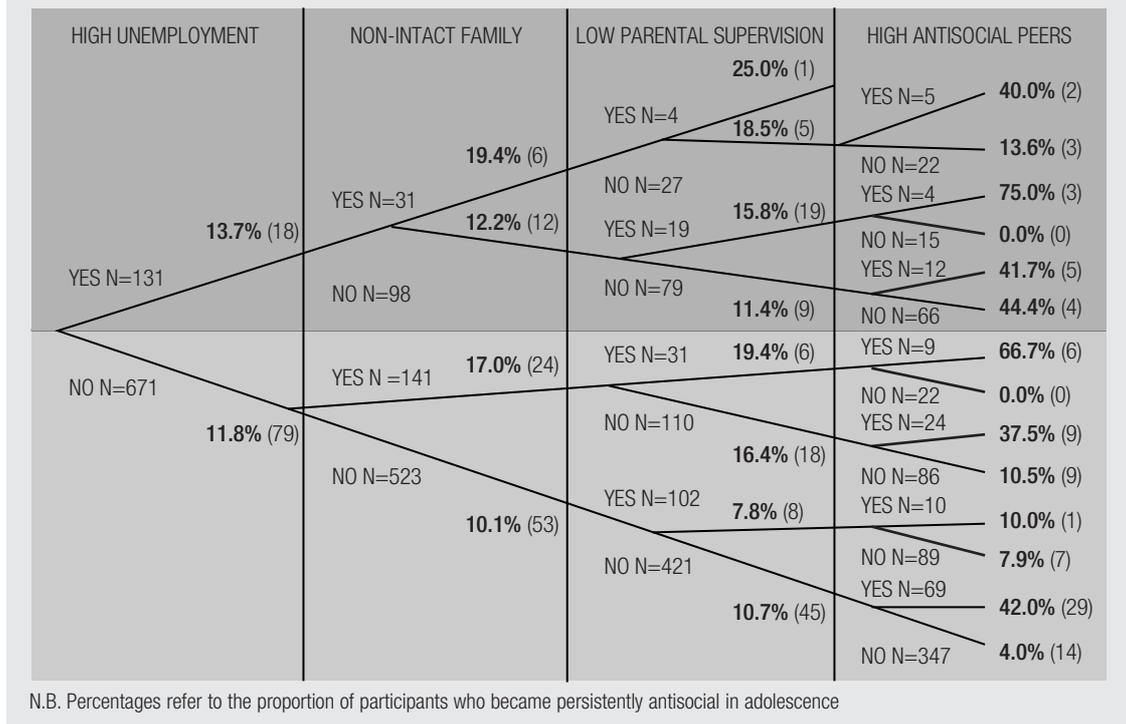
N.B. Percentages refer to the proportion of participants who became persistently antisocial in adolescence.

**Figure 30** Indirect effects of high socio-economic disadvantage on Persistent adolescent antisocial behaviour

HIGH DISADVANTAGE	NON-INTACT FAMILY	LOW PARENTAL SUPERVISION		HIGH ANTISOCIAL PEERS	
		YES N	NO N	YES N	NO N
YES N=146 12.3% (18)	YES N=30 16.7% (5)	YES N=6	16.7% (1)	YES N=6	50.0% (3)
		NO N=24	12.5% (3)	NO N=18	5.6% (1)
	NO N=114 11.4% (13)	YES N=24	11.1% (10)	YES N=4	50.0% (2)
		NO N=90	11.1% (10)	NO N=20	5.0% (1)
NO N=656 12.0% (79)	YES N=142 17.6% (25)	YES N=29	20.7% (6)	YES N=9	66.7% (6)
		NO N=113	16.8% (19)	NO N=20	0.0% (0)
	NO N=507 10.3% (52)	YES N=97	8.2% (8)	YES N=23	34.8% (9)
		NO N=410	10.7% (44)	NO N=90	12.2% (11)
			YES N=10	20.0% (2)	
			NO N=84	7.1% (6)	
			YES N=68	42.6% (29)	
			NO N=337	3.9% (13)	

N.B. Percentages refer to the proportion of participants who became persistently antisocial in adolescence.

**Figure 31** Indirect effects of high unemployment on Persistent adolescent antisocial behaviour



However, as with the previous tree diagrams, the small sample size meant that there were insufficient participants to take the next step and examine whether association with antisocial peers increased the risk of engaging in persistent adolescent antisocial behaviour. For example, only one participant lived in a high unemployment area and belonged to a non-intact family and received low parental supervision.

In an attempt to overcome this problem, the order in which the variables were included was reversed (i.e. association with antisocial peers → parental supervision → non-intact family → socioeconomic disadvantage variable), which allowed a larger initial sample size (e.g. n=140 compared with n=65 if low income is used as the initial variable). The reversed tree diagrams did not find an additive effect of socio-economic disadvantage on rates of persistent adolescent antisocial behaviour.

Consistent with our earlier findings concerning direct effects, these figures suggest that adolescents living in highly disadvantaged areas (overall socio-economic disadvantage, low income, or high unemployment areas) were not at an increased risk in engaging in self-reported persistent antisocial behaviour. For example, in Figure 30, the branch that yielded the highest proportion of persistently antisocial adolescents (66.7 per cent) involved young people who lived in areas that were not classed as highly disadvantaged but had other risk factors (e.g. not disadvantaged area → non-intact family → low parental supervision → frequent association with antisocial peers).

The findings again emphasise the potent influence of peers. Branches that included a high degree of association with antisocial peers generally produced a much higher proportion of persistently antisocial individuals than other combinations. Furthermore, the overall level of risk of engaging in persistent antisocial behaviour dramatically increased when association with antisocial peers was added to the model.

For example, while only 15.8 per cent of participants who lived in high unemployment areas and belonged to an *intact family*<sup>13</sup> and received low parental supervision were persistently antisocial, almost three-quarters of participants who possessed these characteristics and frequently associated with antisocial peers were *persistently antisocial*. There were also trends for family characteristics such as a non-intact family, or low supervision, to be associated with higher rates of persistent antisocial behaviour, regardless of location.

#### Crime rates

According to Weatherburn and Lind's (1998, 2001) epidemic model of delinquency, young people who are susceptible to the influence of antisocial peers because of poor parenting practices are at increased risk of becoming antisocial if they live in crime-prone areas. This hypothesis was explored using the descriptive approach described previously. Very similar patterns to

<sup>13</sup> We focused on this trajectory (which included an intact family), as there were sufficient numbers of participants for the findings to be reliable.

those displayed in Figures 29 to 31 were found (details of which are available from the authors), with no trends for higher rates of persistent antisocial behaviour among adolescents living in high crime areas who possessed the mediating family and peer characteristics than among adolescents with similar family and peer environments who lived in other types of areas. Similar findings emerged when the order in which the variables were examined was reversed. As before, problematic peer and family characteristics were found to be associated with higher rates of persistent antisocial behaviour.

## **Discussion and implications**

In summary, this section examined the relationship between area characteristics and self reported engagement in adolescent antisocial behaviour among participants of the ATP. Eight aspects of the local area (unemployment, income, crime, growth, lone-parent families, overall socio-economic disadvantage, economic resources, education and occupation) were examined. Using the eight indicators separately, and in a cumulative disadvantage index, no significant differences were found in the proportion of adolescents displaying *Persistent*, *Experimental* and *Low/non* patterns of antisocial behaviour who resided in disadvantaged areas by comparison with those living in other areas (i.e. areas that were not ranked within the most disadvantaged 20 per cent on these indicators). There were also no differences in rates of antisocial behaviour among adolescents living in metropolitan, regional or rural areas.

Few area differences were also noted in rates of contact with the criminal justice system. The only significant area differences found indicated that adolescents living in high crime areas were actually *less* likely to have had contact with the criminal justice system for offending than other participants. Several explanations were offered for this surprising finding.

Not only were no direct effects of local area characteristics on rates of persistent antisocial behaviour found, such characteristics did not appear to have an indirect effect either. That is, living in a socio-economically disadvantaged or high crime area did not appear to interact with characteristics of the peer and family environment (i.e. non-intact family unit, low levels of parental supervision, association with antisocial peers) to increase the likelihood that an individual would engage in persistent adolescent antisocial behaviour.

The findings reinforced the powerful influence of peer relationships on adolescent antisocial behaviour. Consistent with other findings from this research (Vassallo et al., 2002, sections 2 and 3 of this report) and that of many other researchers (Elliott & Menard, 1996; Weatherburn & Lind, 1998, 2001) it was found that individuals who associated with antisocial peers were at very high risk of engaging in persistent antisocial behaviour themselves. The family factors included in these analyses (belonging to a non-intact family and low levels of supervision) also tended to be associated with higher rates of persistent antisocial behaviour.

While these findings appear to suggest that local area characteristics have little effect on adolescent antisocial behaviour, it should be noted that within the ATP's seemingly large sample (n=970 participants), only a small number of participants (generally less than 30) experienced more than one of the problems investigated (locality, family or peer factors). As a result, it is likely that the sample was not large enough to adequately detect any associations between local area characteristics and engagement in adolescent antisocial behaviour that may have been present.

The broad nature of the location measure used is also likely to have had an impact on the findings. In this research, participants were grouped on the basis of their local government area (LGA). LGAs may be heterogenous in composition, including families living in quite varied socio-economic circumstances. Many studies that have detected location effects on rates of antisocial behaviour have used more narrowly defined measures of location such as postcodes, or even street blocks (Sampson, 2002; Vinson, 1999, Weatherburn & Lind, 1998, 2001). Hence, it is possible that the measure of location used may have been too broad to reveal area differences.

It is also possible that locality characteristics may have changed over the years from 1996 to 2000. It should be noted that many of the indices used, while the latest available, dated from 1996. The amount of change in locality characteristics since this time is unknown, and may have varied across the LGAs included in the present study. Thus, it is possible that the findings have been somewhat affected by changing locality characteristics.

In this research, linkages between broad area characteristics and individual patterns of self-reported antisocial behaviour were explored. This approach assessed whether the general characteristics of an area could be seen to apply to individuals living in the area. The research, while limited in some respects, was able to undertake these individual-level analyses and did not detect any evidence of direct or indirect effects of broad area characteristics on persistent antisocial behaviour. As noted earlier, it is possible for an individual to live in a highly disadvantaged area but not experience disadvantage first-hand (and vice versa). A more fine-grained approach, which would require a much larger sample than the ATP's, might reveal some subtle patterns that could not be identified in these analyses.

Also, Weatherburn (2003) notes that location effects are much more pronounced for serious and persistent offending. These types of antisocial behaviour were quite rare within the ATP sample. Thus, given the type of antisocial behaviour in which ATP participants were generally involved, strong locality effects may not have been expected.

The present research was based on adolescent self-reports of antisocial behaviour. It would be interesting to ascertain whether similar findings regarding locality effects are obtained if official measures of antisocial behaviour (e.g. police and court records) are used instead of self-reports. This is an area that could be explored in future research.

Given these limitations, it is not possible to draw definite conclusions regarding the link between local area characteristics and engagement in antisocial behaviour. Nevertheless, future research into this issue would appear worthwhile. Future research will need to employ much larger samples and include a sizable number of individuals living in extremely disadvantaged areas, in order for these analyses to have adequate power. Furthermore, more detailed measures of location (e.g. as specific as a street block or neighbourhood) and individual-level data on outcomes (e.g. antisocial behaviour) should be obtained if possible.

## 5 *Patterns of antisocial behaviour and substance use at 19-20 years of age*

Antisocial behaviour is reported to show clear age-related variations in type and frequency across adolescence (Moffitt, Caspi, Harrington & Milne, 2001; Ross, Walker, Guarniere & Dussuyer, 1994; Rutter, Giller & Hagell, 1998). For example, such behaviour has been shown to peak in mid adolescence and then decline with age (Baker, 1998; Bond, Thomas, Toumbourou, Patton & Catalano, 2000). This section focuses on the trends and patterns of antisocial behaviour during young adulthood. As part of the Year 2002 survey, the now 19-20 year old men and women participating in the ATP study were again asked to report their engagement in antisocial behaviour. This provided an opportunity to examine trends in antisocial behaviour in the ATP sample in young adulthood, and to investigate the extent to which antisocial behaviour declined with age.

Antisocial behaviour may be expressed in different ways at different stages of development (Moffitt et al. 2001). For instance, the frequency of illicit drug-use is reported to increase throughout adolescence and peak in the twenties (Rutter et al, 1998). Therefore, several items were added to the 19-20 years survey that were not included at the previous time points. Items such as 'illegal access to a computer network' were also included to reflect the changing nature of antisocial behaviour in today's society.

Table 11 presents a summary of the questions used to assess antisocial behaviour at 19-20 years<sup>14</sup>. All questions relate to behaviour within the past twelve months, with the exception of those concerning substance use, which refer to the past month. The data presented come from 1120 young people (56 per cent females).

<b>Table 11</b>	
<b>Assessment of antisocial behaviour at 19-20 years (2002)</b>	
<b>Items</b>	
■	Got into physical fights with other people
■	Stolen something from a person or a house
■	Carried a weapon (e.g. gun or knife)
■	Attacked someone with the idea of seriously hurting them
■	Sold illegal drugs
■	Been in contact with police for an offence (not driving-related)
■	Been charged by police
■	Appeared in court as an offender
■	Purposely damaged or destroyed others' property, including graffiti
■	Shoplifted (taken something from a shop without paying for it)
■	<i>Broken into a house or building to steal something</i>
■	<i>Stolen something from a motor vehicle</i>
■	<i>Stolen a motor vehicle (e.g. car, motor bike)</i>
■	<i>Copied computer software, CDs, DVDs, or videos in order to sell them</i>
■	<i>Been drunk in a public place</i>
■	<i>Evaded paying for services (e.g. public transport, getting into cinema)</i>
■	<i>Illegally accessed a computer network, system or files</i>
■	<i>Received government benefits or compensation that you were not entitled to (e.g. unemployment, youth allowance)</i>
■	<i>Been paid for having sex with someone</i>
■	<i>Used fake money, or someone else's credit / bank card or cheque without permission</i>
■	<i>Used force to get money</i>
■	<i>Had, or tried to have, sex with someone against their will</i>
■	<i>Been in contact with police for a driving-related offence</i>
■	<i>Knowingly bought sold or kept stolen goods</i>
■	<i>Attacked someone while a member of a group or gang</i>
■	Frequency of cigarette use*
■	Frequency of alcohol use*
■	Frequency of marijuana use*
■	Frequency of sniffing to get high (e.g. glue, petrol, aerosols)*
■	Frequency of LSD use and other hallucinogens (MDMA, acid, trips)*
■	Frequency of ecstasy use or other designer drugs (XTC, E)*
■	Frequency of amphetamines use (speed, uppers, fast)*
■	Frequency of heroin use (H, smack, hammer)*
■	Frequency of cocaine or crack use*
■	Frequency of sleeping tablets/tranquillisers use (without a doctor's prescription)*

*Note.* \* These items relate to the past month; all other items refer to the past year.  
*Italicised* items are new items added for the assessment of antisocial behaviour at 19-20 years of age (2002).

14 For a summary of questions used to assess antisocial behaviour at 13-14 years (1996), 15-16 years (1998) and 17-18 years (2000) please refer to Vassallo et al. (2002).

## Frequency of antisocial acts and substance use at 19-20 years

The frequency of involvement in different types of antisocial behaviour and substance use at 19-20 years of age is presented in Tables 12 and 13. As in the First Report, antisocial acts have been grouped into four categories: (1) those involving property offences, (2) authority conflict and other problems, (3) violent and drug-related antisocial acts, and (4) substance use. The frequency of criminal justice contacts, as a consequence of antisocial acts, was also measured. As will be expanded on below, rates of most types of antisocial behaviour were low with the exception of a few acts such as 'soft' drug use (alcohol, cigarettes and marijuana), drinking in public, and evading payment for services (e.g. fare evasion).

<b>Table 12</b>	<b>Frequency of antisocial acts in the ATP sample at 19-20 years of age (%).</b>				
	<b>Not at all</b>	<b>Once or Twice</b>	<b>Three or Four Times</b>	<b>Five or Six Times</b>	<b>Seven or More Times</b>
<b>Property</b>					
Damaged property	86.6	10.0	1.8	0.9	0.8
Bought/sold stolen goods	89.9	7.9	1.4	0.6	0.2
Shoplifted	90.9	5.6	1.8	0.7	1.0
Stolen from person/house	96.4	3.0	0.5	-	0.1
Stolen from vehicle	98.5	1.3	0.2	-	-
Broken into house	99.0	0.8	0.2	-	-
Stolen vehicle	99.5	0.5	-	-	-
<b>Authority conflict and other</b>					
Drunk in public	31.3	20.8	11.1	8.5	28.6
Evaded paying	61.7	18.8	7.1	3.9	8.4
Copied computer software	92.5	3.0	2.0	1.1	1.4
Illegal computer access	95.7	1.9	1.1	0.5	0.8
Illegally received govt benefits	98.2	1.0	0.4	0.2	0.3
Used fake money	99.3	0.4	0.3	-	0.1
Paid for having sex	99.6	0.4	-	-	-
<b>Violent and drug related</b>					
Fights	83.9	13.3	1.9	0.6	0.3
Sold illegal drugs	94.2	1.7	1.3	0.6	2.1
Weapon	96.2	1.8	0.8	0.4	0.8
Attacked	98.3	1.4	0.1	0.1	0.2
Force to get money	98.6	1.0	-	-	0.4
Attacked in gang	99.2	0.8	-	-	-
Sex without consent	99.8	-	-	-	0.2
<b>Criminal justice contact</b>					
Contact (driving)	79.0	17.9	2.0	0.8	0.3
Contact (other)	94.6	4.8	0.4	0.1	0.1
Charged	95.5	4.1	0.2	0.1	0.1
Court	97.6	2.2	0.1	-	0.1

<b>Table 13</b>	<b>Frequency of substance use (days in past month) in the ATP sample at 19-20 years of age (%)</b>					
<b>Substance</b>	<b>Not at all</b>	<b>One to Six Days</b>	<b>Seven to Twelve Days</b>	<b>Thirteen to Eighteen Days</b>	<b>Nineteen to Twenty-Four Days</b>	<b>Twenty-Five to Thirty Days</b>
Alcohol	11.1	54.1	24.4	5.7	3.0	1.9
Cigarettes	61.6	12.7	3.3	1.7	2.8	17.6
Marijuana	78.0	15.3	2.3	1.2	1.0	2.3
Sniffed	94.5	5.4	0.1	-	-	-
LSD	94.8	5.0	0.2	-	-	-
Tranquillisers	97.7	2.1	0.2	-	-	-
Amphetamines	98.6	1.3	0.1	-	-	-
Ecstasy	98.8	1.1	0.1	-	-	-
Heroin	98.8	1.2	-	-	-	-

Tables 12 and 13 show that for almost all aspects, 90 per cent or more of young people reported no recent involvement in the various types of acts. Only on 7 of the 35 items, had more than 10 per cent engaged in the behaviour. These were: *property damage, fighting, being drunk in a public place, evading paying for services, and alcohol, cigarette and marijuana use*. Thus, it seemed that the antisocial behaviours most frequently engaged in were relatively minor.

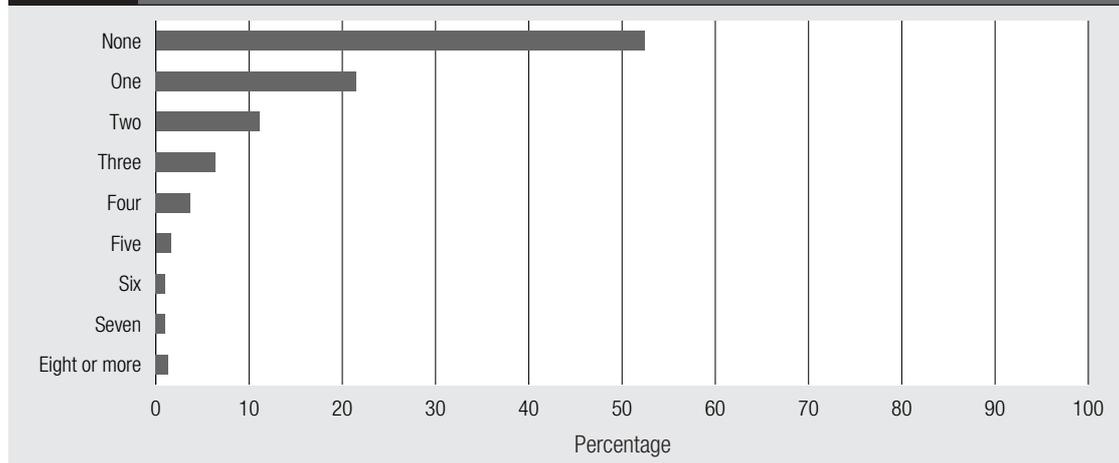
Figure 32 shows the number of different types of antisocial acts that young people had engaged in during the past year (or month in the case of marijuana or illicit drug use). Some acts, e.g. *alcohol or cigarette use, evading paying for services, and being drunk in a public place*, were so common as to appear almost normative. These behaviours were therefore excluded when computing the total number of types of antisocial acts engaged in. *Contact with the criminal justice system* was also excluded, as it is usually a consequence of antisocial behaviour, but is not in itself an antisocial act. It was found that just under half the young people reported engagement in one or more type of antisocial behaviour (47.6 per cent). However, considerably fewer (15 per cent) reported high levels of antisocial behaviour (3 or more different types of antisocial acts)<sup>15</sup>.

Figures 33-38 present the overall proportions of males and females, and the proportion of the entire cohort, who reported engaging in different types of antisocial acts on at least one occasion or more during the past 12 months (or past month for substance use).

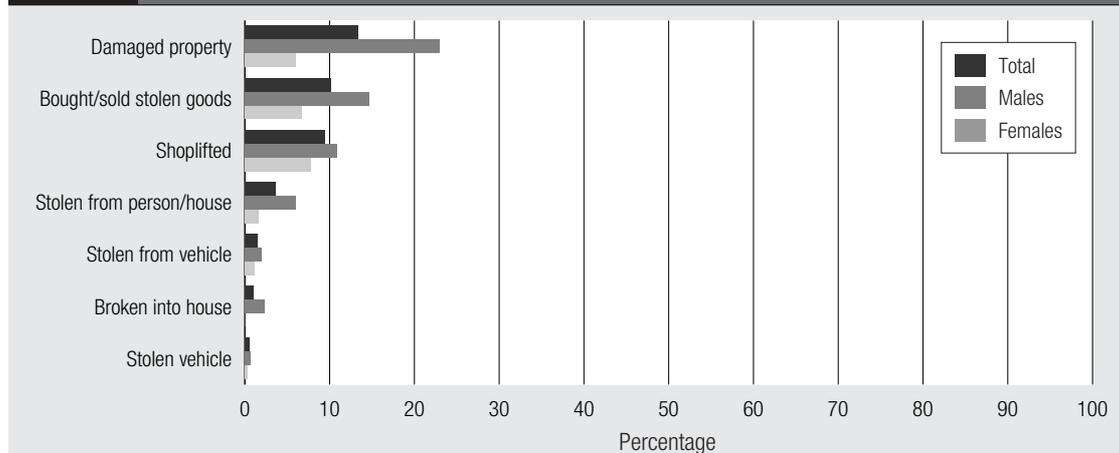
### Property offences

As shown in Figure 33, engagement in *damaging public property, buying/selling stolen goods, and shoplifting* was relatively common (approximately 9-13 per cent). Other property offences were less common with 4 per cent or fewer reporting having committed these acts in the past year.

**Figure 32** Number of different types of antisocial acts that young people engaged in during the past year (or past month for drug use)



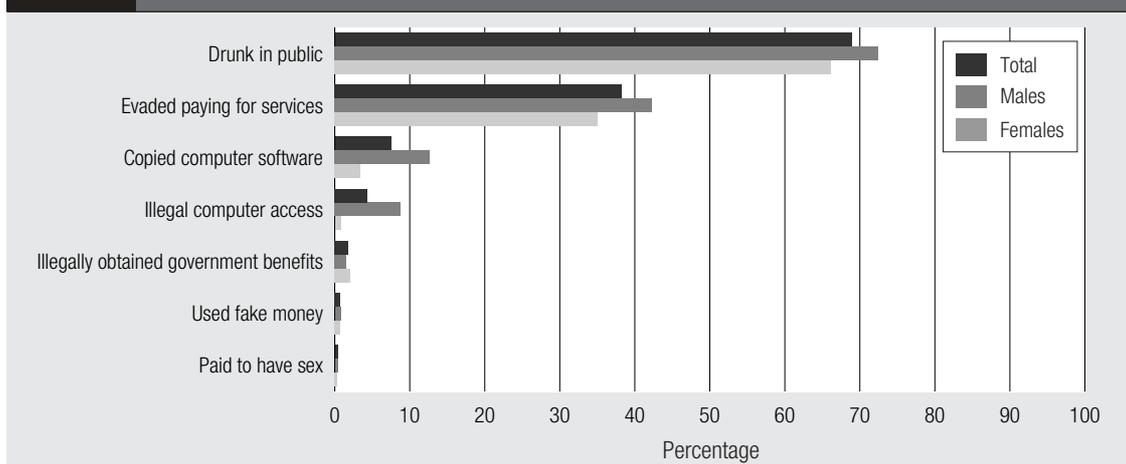
**Figure 33** Property offences at 19-20 years of age



*Note.* Damaged property = Purposely damaged or destroyed others' property, including graffiti; Bought/sold stolen goods = Knowingly bought sold or kept stolen goods; Shoplifted = Shoplifted (taken something from a shop without paying); Stolen from person/house = Stolen something from a person or a house; Stolen from vehicle = Stolen something from a motor vehicle; Broken into house = Broken into a house or building to steal something; Stolen vehicle = Stolen a motor vehicle (e.g. car, motor bike)

<sup>15</sup> Being drunk in a public place and avoiding paying for services were excluded, as they were so common as to appear almost normative. Only marijuana and other illicit substance use were included, as other substance use is legal at this stage.

**Figure 34 Authority conflict and other antisocial acts at 19-20 years of age**



*Note.* Drunk in public = Been drunk in a public place; Evaded paying for services = Evaded paying for services (e.g. public transport, getting into a cinema); Copied computer software = Copied computer software, CDs, DVDs, or videos in order to sell them; Illegal computer access = Illegally accessed a computer network, system or files; Illegally obtained govt benefits = Received government benefits or compensation that you were not entitled to (e.g. unemployment, youth allowance); Used fake money etc = Used fake money, or someone else's credit / bank card or cheque without permission; Paid to have sex = Been paid for having sex with someone.

**Authority conflict and other antisocial acts**

As Figure 34 shows, the frequency of being *drunk in public* was very common (over two-thirds), which reflects the high incidence of alcohol use by this age group (see Figure 36). A considerable proportion of young people (approximately 40 per cent) reported *evading paying for services*. *Computer-related* antisocial acts were less common (4-8 per cent), while other authority conflict acts were rare with fewer than 2 per cent of participants reporting that they had *used fake money*, *received money for having sex*, and *illegally received government benefits*.

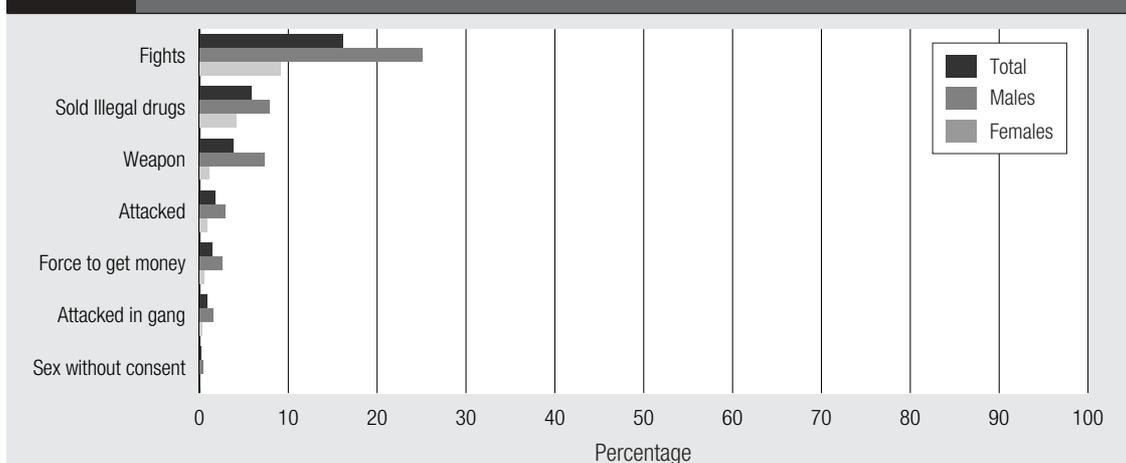
**Violent and drug-related antisocial behaviours**

Figure 35 indicates that involvement in *physical fights* was relatively frequent, with approximately 16 per cent of 19-20 year olds reporting that they had been involved in a *physical fight* with another person in the last year (although as Table 12 shows, for most this was only once or twice). The proportion of participants reporting that they had *carried a weapon* or *sold illegal drugs* was lower (approximately three and six per cent, respectively). The frequencies of other antisocial acts were very low, with two per cent or less reporting *attacking another individual*, *attacking another individual while in a gang*, *attempting to have sex without consent*, and *using force to get money*.

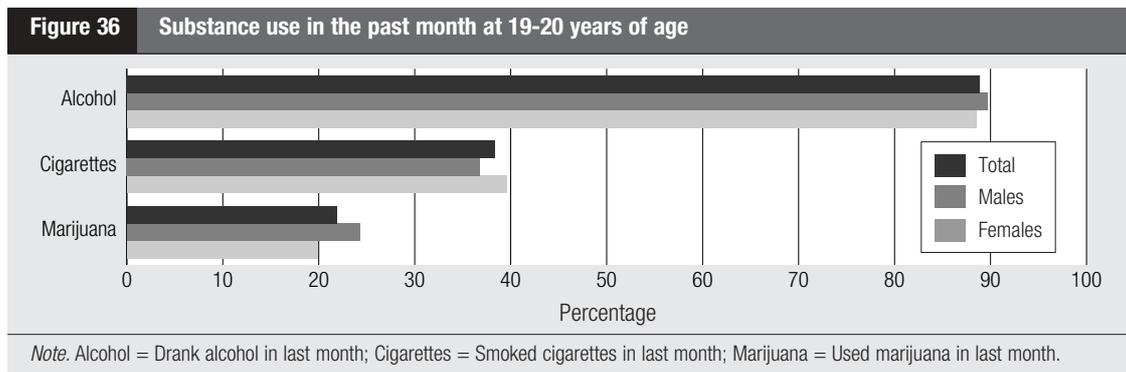
**Substance use**

As mentioned earlier, all questions relating to substance use refer to participants' use within the past month. Figure 36 shows that *consumption of alcohol* was very common with only 11 per cent reporting no alcohol use in the past month. *Tobacco smoking* was also common (approximately 38 per cent), and *marijuana use* was also relatively frequent (approximately 20 per cent).

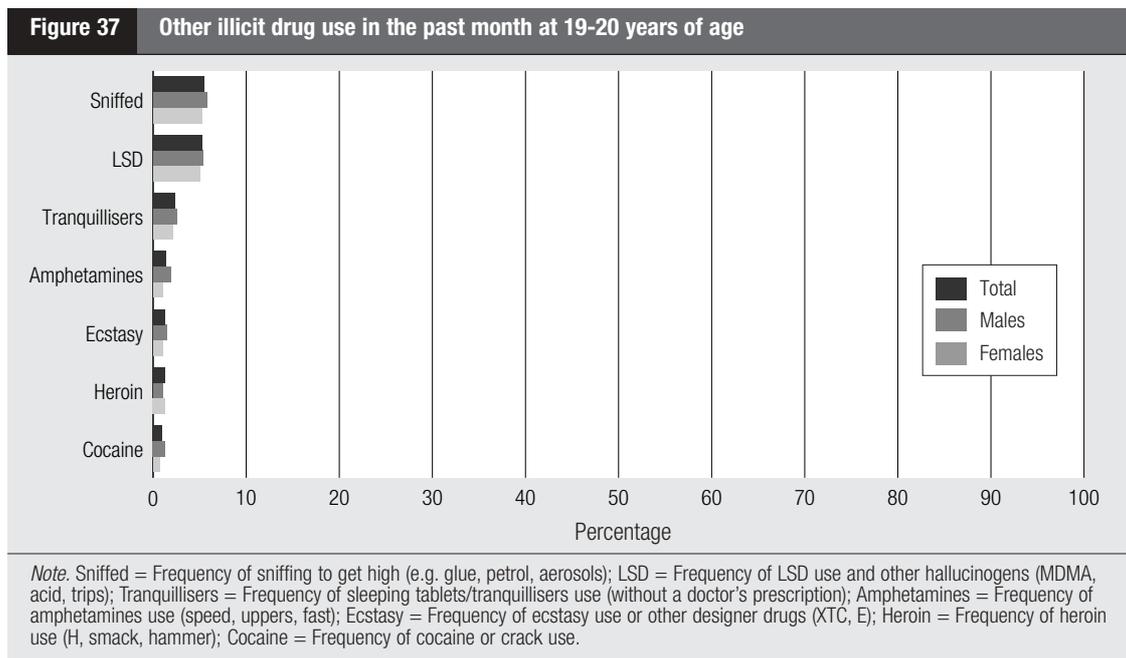
**Figure 35 Violent and drug-related antisocial acts at 19-20 years of age**



*Note.* Fights = Got into physical fights with other people; Sold Illegal Drugs = Sold illegal drugs; Weapon = Carried a weapon (e.g. gun, knife); Attacked = Attacked someone with the idea of seriously harming them; Force to get money = Used force to get money; Attacked = Attacked someone while a member of a group or gang; Sex without consent = had, or tried to have, sex with someone against their will.

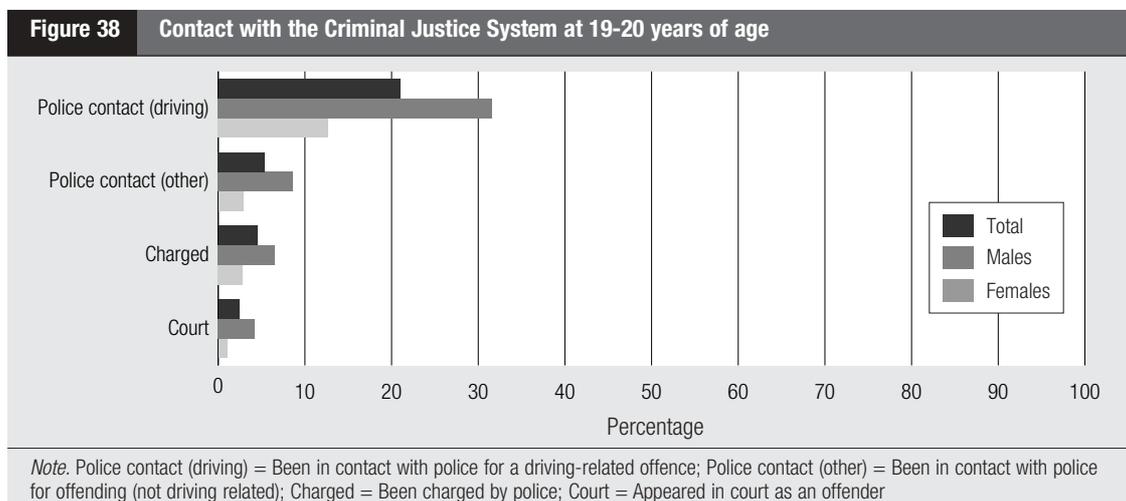


As shown in Figure 37, the use of other types of illicit drugs was much less common than the use of *alcohol, tobacco and marijuana*. The reported frequencies of *sniffing (glue, etc)* to get high and *LSD use* were approximately five per cent, while the use of other illicit drugs such as *cocaine* and *ecstasy* was approximately two per cent or lower.



*Criminal justice contacts*

*Contact with police for driving offences* was a relatively frequent occurrence among 19-20 year olds, with approximately 20 per cent of individuals reporting contact with police for a driving offence in the past year (see Figure 38). Reported *contact with police for other offences* was otherwise low, at just under 6 per cent. A total of 5 per cent had been *charged by police*. The frequency of *court appearances* was even lower (approximately two per cent).



**In summary**, some types of antisocial behaviour were quite common among the ATP 19-20 year olds. Authority conflict acts were common with approximately two-thirds of young people reporting being *drunk in a public place* and approximately four out of ten admitting *evading paying for services*. Violent and property acts were less common, with the highest reported frequencies being for involvement in a *physical fight* (approximately 16 per cent) and *property damage* (approximately 13 per cent). Substance abuse was also quite common. A very high proportion reported using *alcohol*, and there was also relatively high *tobacco* and *marijuana* use. Few young people reported the use of illicit drugs such as heroin and ecstasy. A relatively high proportion (around 20 per cent) had been in contact with police for *driving offences*, but a lower proportion (approximately five per cent) had been in contact with police for *other offences*.

Overall, engagement in antisocial behaviour was found to be relatively common, with 46% reporting committing one or more types of antisocial acts during the past year (or month for marijuana or illicit drug use). However, most young people were involved in a small number and range of antisocial acts. Very few engaged in the behaviours on more than one occasion, and only 15 per cent engaged in high levels of antisocial behaviour (3 or more different antisocial acts).

## Frequency of antisocial acts and substance use among males and females at 19-20 years

Figures 33-38 also show the proportion of males and females who reported engaging in each type of antisocial act. It should be noted that these graphs depict the *relative proportion* of males and females who reported engaging in each antisocial act (i.e., relative to the number of participants of that sex).

### **Property offences**

As shown in Figure 33, higher proportions of males than females reported engaging in each property offence. This difference was most notable for *damaging property* (just over 23 per cent of males compared with 6 per cent of females).

### **Authority conflict and other problems**

Higher proportions of males than females reported being *drunk in public*, *evading paying for services*, *illegally accessing computer systems*, and *illegally copying computer software* (see Figure 34). This difference was most evident for *computer-related acts*. Very low proportions of both males and females reported *using fake money*, and *receiving money for having sex*.

### **Violent and drug-related antisocial behaviours**

As Figure 35 displays, without exception, a higher proportion of males than females reported engaging in violent and drug-related antisocial behaviours. The gender difference was most noticeable for involvement in *physical fights* (approximately 25 per cent of males compared with just under 9 per cent of females) and *carrying a weapon* (approximately 7 per cent of males compared with about 1 per cent of females).

### **Substance use**

As shown in Figure 36, a similar proportion of males and females reported having used *alcohol*, *tobacco*, and *marijuana*. Males and females also reported similar use of various *illicit drugs* (see Figure 37).

### **Criminal justice contacts**

As shown in Figure 38, higher proportions of 19-20 year old males than females reported *contact with police for driving offences*, *contact with police for other offences*, being *charged by police*, and *appearing in court*.

**In summary**, being *drunk in public* and '*soft*' *substance use* were equally very common for both sexes. While a relatively high proportion of both males and females reported *evading paying for services*, this was somewhat more common among males than females.

For males, involvement in *physical fights* was relatively common (approximately one-in-four), while approximately one-in-five reported engaging in *property damage*. A relatively high proportion of males reported *contact with police for driving offences* (just over 30 per cent), engaging in *computer-related antisocial acts* (8-13 per cent), *buying or selling stolen goods* (approximately 14 per cent), and *shoplifting* (almost 11 per cent). Between 5 and 10 per cent reported *selling illegal drugs*, *carrying a weapon*, *stealing from a house*, *police contact for non-driving offences*, and being *charged by police*. All other types of antisocial behaviour were rare, at lower than 5 per cent rate of occurrence.

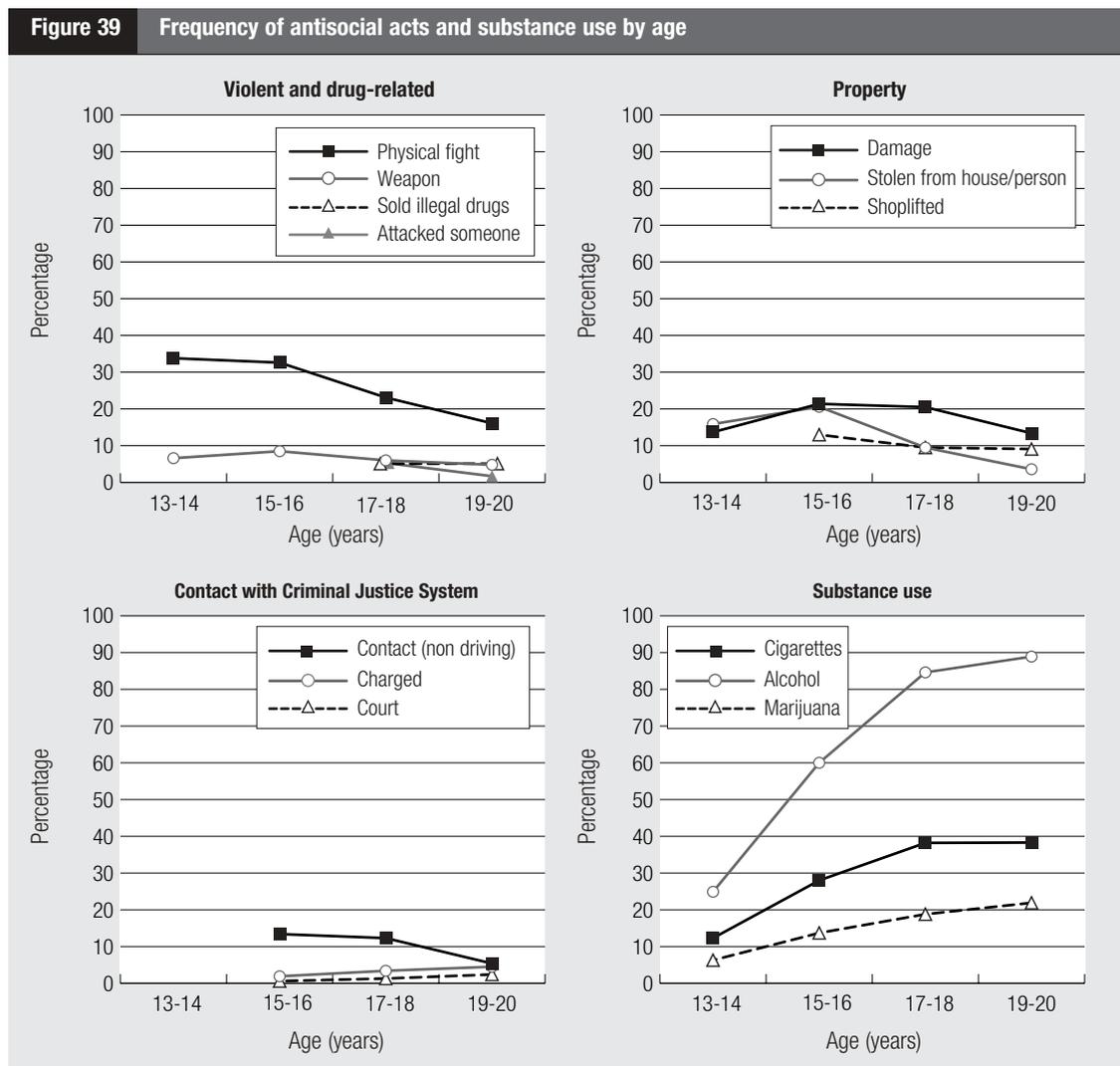
For females, a relatively high proportion of females reported *police contact for driving offences* (approximately 13 per cent), while frequencies for *physical fights*, *shoplifting*, *buying or selling stolen goods*, and *damaging property* were between 6 to 9 per cent. Other types of antisocial offences were rare, at lower than 5 per cent.

## Across time patterns of antisocial behaviour and substance use

Developmental trends in antisocial behaviour across adolescence and early adulthood were next examined to explore the decline of antisocial behaviour with age. The pattern of antisocial behaviour at 19-20 years was compared to patterns at earlier time points of 13-14 years (1996), 15-16 years (1998), and 17-18 years (2000).

The overall rate of high levels of antisocial behaviour (three or more different types of antisocial behaviour in the past year) appears to have declined. At 19-20 years, 15 per cent had engaged in 3 or more different antisocial acts, by comparison with 20 per cent at 15-16 and 17-18 years, and 12 per cent at 13-14 years.

Figure 39 displays the proportion of young people who reported engaging in a particular type of antisocial act at each of the time points at which the act was assessed (for some acts this was only two or three time points). It was not possible to compare the frequencies of some authority conflict antisocial acts, illicit drug use and several other antisocial acts across time points as the items were not included or were not equivalent at multiple time points.



There was a clear trend for the frequency of property and violent antisocial acts at 19-20 years of age to be lower than at earlier ages. Notably, the frequency of *damaging property, stealing from a person or house, attacking another individual, carrying a weapon,* and being involved in a *physical fight* continued to decrease from a peak incidence at earlier ages. Engagement in *selling illegal drugs* and *shoptlifting* at 19-20 years remained at similar levels to that of 17-18 years of age. Reported 'soft' drug use at 19-20 years was also comparable to 17-18 years of age. While criminal justice contact at 19-20 years had increased from earlier time points, this increase was due to the frequency of *police contact for driving offences*. As shown in Figure 39, *contact with police for non-driving offences* showed a decrease at 19-20 years. *Court appearances* and being *charged by police*, though still at low levels, increased from earlier time points. While rates of most antisocial acts decreased at 19-20 years of age, the major exception was 'soft' drug use (alcohol, tobacco, and marijuana), which was similar to the previous time point of 17-18 years.

These trends are consistent with other studies which report an escalation, peaking and then decline in the incidence of antisocial behaviour over adolescence (Baker, 1998; Bond, Thomas, Toumbourou, Patton & Catalano, 2000), while the prevalence of alcohol, tobacco and marijuana use is reported to increase throughout adolescence and peak in the twenties (Davison, Ferraro and Wales, 2000; Rutter, Giller, & Hagell, 1998; Spooner, Hall & Lynskey, 2001). Interestingly, these self report trends show a similar pattern to the age-profiles of persons arrested in Victoria for comparable types of offences (Ross et al, 1994). Nevertheless, despite the encouraging lower rates of engagement in most antisocial acts at 19-20 years compared with earlier time points, there remains a number of young people who are still offending at this age and who therefore continue to be of concern to the criminal justice system and the communities in which they live.

**In summary**, the frequency of most property and violent antisocial acts at 19-20 years continued to decrease from a peak at earlier years. Engagement in selling illicit drugs, shoplifting and 'soft' drug use remained at similar levels to that of 17-18 years of age. Criminal justice contact at 19-20 years continued to increase from earlier time points, but this was mostly due to police contact regarding driving offences. Overall, fewer young people were involved in high levels of antisocial behaviour than in mid and late adolescence.

## 6 *Conclusions*

In conclusion, the findings of this Second Report build upon those of the First Report and continue to significantly increase our understanding of the development of adolescent antisocial behaviour among a community sample of young Victorians.

The First Report described pathways to persistent and experimental adolescent antisocial behaviour. It found that young people who engaged in persistent adolescent antisocial behaviour first began to exhibit more difficulties than those who engaged in little or no adolescent antisocial behaviour during the early primary school years, while youth who engaged in experimental, transitory adolescent antisocial behaviour first displayed more problematic characteristics than non-antisocial youth in the early secondary school years.

This Second Report focused on four broad issues. These were: a) pathways to and precursors of violent and non-violent antisocial behaviour in late adolescence; b) resilience from the development of persistent adolescent antisocial behaviour; c) the relationship between local area characteristics and engagement in adolescent antisocial behaviour; and d) antisocial behaviour and substance use at 19-20 years, and across-time patterns from adolescence to early adulthood.

Distinctive pathways to violent and non-violent antisocial behaviour in late adolescence were identified. The small group of individuals who engaged in both violent and non-violent antisocial behaviour appeared more problematic than those who engaged in little or no antisocial behaviour from early childhood onwards, while those who engaged in predominantly non-violent antisocial behaviour began to exhibit difficulties in mid to late childhood. Those who engaged in primarily violent behaviour became more problematic than non-antisocial youth in early adolescence. This report has also shown that changes in pathways can occur even at a relatively late stage, as demonstrated by the large resilient group, who exhibited multiple risks for persistent adolescent antisocial behaviour during childhood, but did not in fact go on to engage in this type of behaviour in adolescence.

Taken together, these findings suggest that there are several developmental pathways to adolescent antisocial behaviour, and a number of key transition points in which changes in developmental pathways may occur. These may provide significant opportunities for intervention. The most notable transition points appear to occur at 5-6 and 12-13 years. Interestingly, both these transition points tend to coincide with changes in educational settings (i.e. from preschool to primary school, and from primary school to secondary school, respectively). These findings suggest that crime prevention strategies could best focus on assisting young people to successfully negotiate these two transition points, as these ages/stages of development appear to represent key periods in the development of adolescent antisocial behaviour.

In the First Report, it was proposed that early interventions aimed at diverting children from pathways to persistent adolescent antisocial behaviour were most appropriate during mid-childhood (age 5-6). While this appears true for the majority of young people, the findings of this Second Report suggest that intervention may be appropriate at somewhat different ages or stages of development for particular types of antisocial behaviour. For example, interventions during early childhood and prior to the commencement of primary school would appear particularly beneficial for the very small sub-group of children who exhibit a propensity for both violent and non-violent antisocial behaviour in late adolescence, while interventions with children who later engage in predominantly either violent or non-violent adolescent antisocial behaviour, but not both, would seem to have more value at later ages.

The findings of the Second Report suggest that interventions implemented after mid-childhood (ages 5-6) may still be successful in preventing the development of persistent adolescent antisocial behaviour. For example, two groups of children identified as being 'at-risk' at 11-12 years of age, who differed in their subsequent levels of antisocial behaviour were compared; one group which became persistently antisocial and the other larger group which engaged in little or no adolescent antisocial behaviour. These analyses revealed that these two 'at-risk' groups were very similar until early adolescence, at which point, their trajectories began to diverge. This finding provides hope that vulnerable children may still be amenable to change in late childhood and early adolescence.

In addition, this Report also highlights the broad range of personal and environmental characteristics that may encourage or inhibit the development of adolescent antisocial behaviour. For example, individuals who engaged in predominantly violent, predominantly non-violent or both types of antisocial behaviour all tended to exhibit higher levels of 'acting-out' behaviour problems, less developed social skills and more school adjustment and achievement difficulties than participants who engaged in little or no adolescent antisocial behaviour. Furthermore, 'at-risk' children who became persistently antisocial in adolescence were consistently more likely to associate with antisocial peers, received lower levels of parental supervision, were more attracted to thrill-seeking and adventurous activities, and tended to be more gregarious in nature than 'at-risk' children who engaged

in little or no adolescent antisocial behaviour. These findings suggest that the aetiology of adolescent antisocial behaviour is complex, with many individual attributes and environmental characteristics interacting and impacting on the development of this type of behaviour. Hence, rather than adopting a narrow focus, crime prevention strategies should aim to target multiple aspects of children's and adolescents' lives.

The findings clearly point to certain personal and environmental characteristics that appear particularly important in the development of antisocial behaviour. Most notably, the findings of both Reports suggest that association with antisocial peers is a powerful risk factor for engaging in antisocial behaviour, while the absence of antisocial peer friendships is a strong protective factor against it. Other factors that appear to be particularly important to the development of adolescent antisocial behaviour include individual attributes such as temperament style, social skills and behaviour problems; family-related variables (particularly parenting style and the quality of parent-child relationships); and levels of school bonding and achievement. Interestingly, the characteristics of the area in which an individual lives (i.e. income levels, unemployment rates, proportion of lone-parent families) did not appear to impact on self-reported engagement in adolescent antisocial behaviour in this sample. However, it is likely that methodological issues (i.e. a broad measure of location & the study's sample size) limited our investigation of location effects on antisocial behaviour, and further research into this issue would appear valuable.

Finally, this report provides some insight into the changing nature and incidence of antisocial behaviour and substance use over adolescence and early adulthood. In the First Report, it was noted that antisocial behaviour was very common over the adolescent years (between the ages of 13 and 18 years). Analyses of data collected when the young people were 19 to 20 years suggest that some types of antisocial behaviour and substance use are still widespread in young adulthood. For example, high proportions reported using alcohol, tobacco and marijuana, and authority conflict acts such as being drunk in a public place and evading paying for services were also very common. However, the frequency of most property and violent antisocial acts had decreased from earlier time points. These findings suggest that there are age-related fluctuations in rates of self-reported antisocial behaviour, substance use and in the nature of offences, which need to be taken into account by crime prevention strategies.

Overall, the findings of these first two Reports provide valuable insights into the development of adolescent antisocial behaviour among participants of a large community-based longitudinal study. Nevertheless, there are still many gaps in our understanding of the development of this type of behaviour. For example, what factors contribute to the maintenance, desistance or initiation of antisocial behaviour in young adulthood? Are the precursors of specific types of antisocial behaviour (e.g. substance use) different from those for antisocial behaviour as a whole? These are among the questions to be examined in the Third Report, utilising data from the most recent data collection wave (in 2002), when participants were aged 19-20 years.

## 7 *Next phase of the research*

These First and Second Reports of the patterns and precursors of adolescent antisocial behaviour have provided a detailed account of the nature, prevalence, and development of antisocial behaviour among participants of the Australian Temperament Project. Further important issues remain to be explored concerning the development of antisocial behaviour among this sample of young Victorians. The collection of self-report data from participants aged 19-20 years will provide an opportunity for the project team to investigate some of these issues and further extend understanding of the development of antisocial behaviour in this sample.

Issues to be investigated in the Third Report include:

- Pathways to persistent antisocial behaviour among low-risk children
- The link between specific dimensions of adolescent delinquency (e.g. substance use) and other types of antisocial behaviour
- Similarities and differences between the characteristics of offenders and victims
- The relationship between self-reported antisocial acts and official police crime records
- Compliance with law – the impact of civic mindedness and perceptions of fairness of the justice system, and
- The initiation, persistence and desistance of antisocial behaviour in the transition from adolescence to adulthood.

By investigating these issues we hope to provide greater insight into the development of antisocial behaviour among young people, and to inform early intervention and prevention strategies being developed in Victoria.

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