The Influence of Parenting Style on Adolescent Substance Use

by

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M.Sc., B.Sc.

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Doctor of Philosophy

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DEAKIN UNIVERSITY
CANDIDATE DECLARATION

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“No duty is more urgent than that of returning thanks.”

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Abstract

This PhD thesis supervised within the School of Psychology at Deakin University was completed in the form of four papers prepared for publication. The thesis examined Baumrind’s (1989) proposition that: (1) parent behaviours can be categorised to identify groups of parents with distinct parenting styles; and (2) authoritative parenting styles (that are high in both nurturance and demandingness) predict fewer adolescent development problems, specifically less early alcohol and illicit drug use. The first paper was a “systematic review of the influence of parenting style on adolescent alcohol and drug use”. This paper identified 23 previous studies that longitudinally examined the effect of parenting behaviours on adolescent alcohol and drug use. Within the included studies few modelled the effect of parenting style subgroups. The second, third and fourth papers examined data from a longitudinal follow-up of a large (N ~ 2000) community sample of Australian early secondary school-age adolescents conducted across 2-years with over 90% retention. “Latent Class Analysis” was used to model adolescent reports of parent behaviours at the first wave of the study and found that sub-groups according with Baumrind’s parenting style groups were identifiable. These papers used regression analysis to examine whether Baumrind’s parenting style groups predicted the development of adolescent alcohol and illicit drug use 2-years later, after multivariate analysis controlling for other predictors such as baseline substance use and antisocial behaviour. A specific aim of these analyses was to establish whether specific parenting behaviours or their combinations in identifiable parenting style groups were better predictors of adolescent alcohol and illicit drug use. Paper two examined the longitudinal influence of parenting style on adolescent alcohol use.
Paper three examined the longitudinal influence of parenting style on adolescent cannabis use. These papers identified that Baumrind’s parenting style groups were significant predictors of adolescent substance use, but these effects were not maintained in multivariate analyses controlling for specific parenting behaviours. Paper four examined differences in parenting behaviours and their longitudinal influences on adolescents’ alcohol and drug use within migrant families from different cultural and language backgrounds. This study found that differences in parenting behaviours may partially explain lower rates of adolescent alcohol and drug use within these minority families. In overview, the study findings suggest that in early adolescence specific parenting behaviours were more direct predictors of the development of adolescent substance use than the more complex parenting style categories. One implication of these findings is that future evaluations of Australian parent education programs for early adolescent age groups could usefully focus on the effect of conveying specific parenting behaviours, particularly family management skills, in efforts to assist parents to prevent adolescent alcohol and drug use.
Parenting practices are some of the earliest influences that have been shown to impact healthy child development. Parents are faced with the challenge of selecting and applying a style of parenting that will be effective in assisting their child to enjoy healthy development. The PhD thesis that follows is concerned with identifying patterns of parenting that longitudinally predict adolescent development problems, indicated by early alcohol and illicit drug use.

Adolescent alcohol and other drug use is an important problem internationally. The early initiation of alcohol and drug use in adolescence has been shown to result in an increased risk of problems such as substance use and mental health disorders, accidents and injuries, brain damage and poorer outcomes in education and in other life domains through adulthood. Preventing harmful alcohol use is one outcome sought by better understanding influences that affect healthy child development. Prevention is widely understood to be better than cure. Many interventions to prevent adolescent alcohol and drug problems recognise the importance of working with families.

The sections that follow provide an overview of the topics covered in this PhD thesis. The specific focus of this PhD thesis is the influence of parenting styles on the development of adolescent substance use. In this context substance use refers to both the use of licit drugs such as alcohol and illicit drugs, the most common in adolescence being cannabis use. The thesis focuses specifically on how parenting styles influence adolescent alcohol and cannabis use, and whether these influences are different for Australians from varied ethnicity backgrounds.
The PhD thesis is comprised of eight chapters. This first chapter presents an overview of the thesis. Chapter two provides a theoretical introduction, followed in chapter three by a methodological introduction. Chapter four presents a systematic literature review of longitudinal studies that have previously examined the predictive effect of parenting behaviour on the development of adolescent substance use. The thesis is comprised of three empirical studies analysing a large longitudinal cohort study. Chapter five presents the first empirical study, a longitudinal study examining the influence of parenting style on adolescent alcohol use. Chapter six, the second empirical study, examines the longitudinal effect of the influence of parenting style on adolescent cannabis use. In chapter seven the final empirical analysis examines differences by parent and child place of birth and home language in the effect of parenting on adolescent alcohol and cannabis use. The closing chapter (chapter eight) presents an integrated discussion overviewing the project findings and integrating with prior research.

In chapter two (the theoretical introduction) the effects of systems in human development are examined with reference to the context of the PhD. The systems examined focus on culture, and community and also family systems in the development of adolescent alcohol and drug use. Psychological and behavioural theories of human development focusing on the adolescent development phase are also summarised in this chapter. Systems theory is introduced in chapter two as a framework for understanding human child development within the specific context of the community and family. Diana Baumrind’s theory of parenting styles as predictors of adolescent substance use is introduced in this chapter. According to Baumrind, parenting styles refer to the efforts parents make to achieve a balance in emphasising control and the need for the child’s supervision (demandingness), as against offering the child affection and support (nurturance). The balance the parent achieves in emphasising demandingness and nurturance are
the key characteristics that define parenting styles. Baumrind’s theory that it is parenting styles
rather than specific parenting behaviours that are the most important in predicting the
development of adolescent substance use was tested in the present thesis. This chapter finishes
by describing how longitudinal studies of child and adolescent developmental risk processes are
applied and analysed to advance theory.

Chapter three examines methodological issues associated with the empirical investigation
of behavioural measures using adolescent self-reports and the use of longitudinal research to
investigate human development. The analytic methods used to distinguish a risk factor from a
predictor are examined in this chapter.

Chapter four presents a systematic literature review of longitudinal studies that have
previously examined the predictive effect of parenting behaviour on the development of
adolescent substance use. This chapter outlines the inclusion criteria and search methodology
that was used to select longitudinal studies examining the relationship between parenting
behaviour dimensions and the development of adolescent substance use. The search reported in
this chapter identified 23 longitudinal behavioural studies. The results of the systematic review
revealed a range of longitudinal studies that have investigated parenting behaviours that are
relevant to Baumrind’s parenting dimensions. The findings revealed that there have been few
studies that have examined whether adolescents can reliably report parenting styles. There have
been few studies that have investigated whether parenting styles are a better than parenting
behaviours in longitudinally predicting the emergence of adolescent substance use. As a method
of integrating findings from the available longitudinal research, a “Family Influences Model”
was proposed in chapter four.
Chapter One: Thesis Overview

The first empirical study in chapter five, which has been submitted to the “Journal of Studies on Alcohol and Drugs”, examined the longitudinal effect of parenting behaviour on the development of adolescent alcohol use. The data set comprised 2,081 secondary school students, recruited in 2004 in metropolitan Melbourne, Australia, who completed three waves of an annual longitudinal survey. The first analysis for this chapter attempted to characterise adolescent perceptions of parenting style using latent class modelling. Adolescent responses to Wave 1 (Year 7, average age 13 in 2004) items indicating Baumrind’s concepts of parental nurturance (attachment, communication and support) and demandingness (monitoring) were analysed using latent class modelling to identify the independent variables. The latent class modelling found a four group solution to be a good-fit to the data, supporting Baumrind’s parenting style theory. Chapter five then reports a multivariate logistic regression analysis that examined the predictive effect of parenting styles on the development of adolescent alcohol use two-years later (in Wave 3, Year 9, average age 15 in 2006), testing Baumrind’s proposal that parenting styles are direct predictors of adolescent alcohol use. Baumrind’s parenting styles were significant longitudinal predictors in unadjusted analyses, but these effects were not maintained in multivariate models that also included parenting behaviour dimensions. The development of adolescent alcohol use appeared to be more directly explained by specific family management behaviours rather than parenting style.

Chapter six reported the second empirical study, evaluating the predictive effect of Baumrind’s parenting style categories on the development of adolescent cannabis use. This study examined whether adolescent reports of parenting styles longitudinally predicted adolescent cannabis use two-years later. Similar to the first empirical study, data from the “Resilient Family” evaluation project was used. The parenting variables reported in chapter five were again
used as the independent variable and the dependant variable was adolescent self-reported cannabis use in Wave 3 (2006). Multivariate logistic regression was used to examine the predictive effect of both parenting styles and parenting behaviours on the development of adolescent cannabis use. The multivariate adjusted findings showed that poor family management increased the risk of adolescent cannabis use while family attachment and communication variables had no significant effect. In contradiction of Baumrind’s theory, parenting style had no direct effect after controlling for specific parenting domains. Country of birth was identified as a strong protective factor that reduced adolescent cannabis use.

Chapter seven examined cultural variation in parenting behaviours and whether parenting has universal or culturally specific effects on the development of adolescent substance use. The effect of parenting behaviour on the development of adolescent alcohol and cannabis use were evaluated in this chapter. Cross-sectional analyses of adolescent reports at the Wave 1 survey (2004) revealed that adolescent self-reports on indicators of parental nurturing behaviours (mother and father attachment, family rewards and family opportunities) were generally higher and alcohol use higher for those reporting an Australian birth or English home language. Multinomial regression was used to examine longitudinal effects. At follow-up in Wave 3 (2006) both alcohol and cannabis use was lower for those reporting a non-Australian birth. Both non-Australian birth and non-English home language at Year 7 were found to uniquely predict lower rates of alcohol and cannabis use in Year 9, after controlling for other risk factors. Parenting behaviours were found to have similar longitudinal effects on adolescent alcohol and cannabis use regardless of culture.

The final chapter (chapter eight) provides an integrated overview of the current thesis including the systematic literature review and the main findings of the three longitudinal studies.
The findings of the three empirical studies are examined in the context of the systematic literature review. The finding that Baumrind’s parenting style categories was less direct predictors of the development of adolescent substance use than the specific parenting demandingness (family management) domain was interpreted with respect to prior studies. Few prior studies have specifically included both parenting style categories and parenting behaviour domains as independent variables. The findings of the three empirical studies were examined in terms of their implications for the design of future longitudinal developmental research studies and for theories of: adolescent development; parenting; the targeting of substance use prevention; and the adjustment of culturally diverse families migrating to countries similar to Australia.
Chapter Two - Theoretical Introduction

The sections that follow provide a theoretical introduction to the major concepts covered in this PhD thesis. The empirical content of the present thesis investigates adolescent self-reports of parenting behaviour and then longitudinally investigates these reports as predictors of the development of alcohol and cannabis use, including a comparison of effects within culturally diverse families. The present chapter examines the role of systems in human development focusing on culture and community and family systems in the development of adolescent alcohol and illicit drug use. In what follows psychological and behavioural human development theories are firstly described, focussing on the adolescent development phase. Next, systems theory is introduced as a framework for understanding human development. Subsequent sections examine the specific focus of community and family systems theory. The chapter finishes by describing how the study of developmental processes is applied within systems theory.

2.1 Adolescence in human development

Adolescence is recognised, from a public health perspective, as an important period in human development where the incidence of potentially health compromising behaviours such as substance use (e.g., alcohol and illicit drug use) escalates. Adolescence emerges around puberty (from approximately age 10) and continues until the achievement of adult social and economic independence (Sawyer et al., 2012). Adolescence is a developmental phase where individuals
experience changes related to sexual maturity and brain development that lead to attainment of new behaviours and capabilities that enable significant transitions in different social environments such as family, peer, and school (Steinberg & Sheffield, 2001; Lerner, Boyd & Du, 2010; Cromer, 2011).

Adolescence emerges in a social historical context. Theorists in the 1960s and 1970s depicted it as a period of challenging developmental projects in efforts to increase independence and form individual identity (e.g., Bandura, 1977; Piaget, 1970). Subsequent research challenged the view that the period was characterised by ‘storm and stress’, suggesting many adolescents made the transition without major problems (Garber, Keiley & Martin, 2002).

Pubertal transitions coincide with other significant transitions in the social context, such as transitions from primary to secondary schools that provide opportunities and expectations to establish relationships with teachers and peers and to reduce time spent under the direct supervision of parents or caregivers. Within pluralistic, democratic societies and free-market economies, early adolescents are required to develop the capacity to make well-reasoned behavioural choices based on internalised values and standards. Within the field of psychology, developmental studies examine how internalised values and standards, the underlying capacity to reason and behavioural skills are influenced by earlier sequences of developmental events and socialisation experiences (Catalano, Hawkins, Berglund, Pollard, & Arthur, 2002).

Many potential health compromising behaviours, including alcohol and illicit drug use, first emerge during adolescence (e.g., Catalano et al., 2012). As behavioural choices are increasingly based on self-responsibility and as the direction provided by parents wanes, some adolescents make choices or enter situations where substance use behaviour is initiated.
Many studies indicate that adolescent alcohol and illicit drug use can lead to a number of potentially destructive health and social consequences. Adolescent alcohol and drug use is a leading international cause of preventable death and disability (Toumbourou et al., 2007). Drinking alcohol in the adolescent years has been shown to be harmful to young people’s physical and social development. Several studies suggest that drinking alcohol in adolescence may lead to heavy alcohol use that can cause neurological damage (Australian Drug Foundation, 2011; Hiller-Sturmhöfel & Swartzwelder, 2005). Adolescent alcohol use increases the risk of: alcohol use disorders; school failure and poor academic results in school; delinquent, violent and antisocial behaviour (McCcambridge, McAlaney & Rowe, 2011); sexual risk taking behaviour (Aquilino & Supple, 2001); and dangerous driving (Webb, Bray, Getz & Adams, 2002). Evidence shows that adolescent cannabis use is associated with a higher risk of problems that include: driving offences (Papafotiou, 2005); poorer employment, education and relationship outcomes (Fergusson & Boden, 2008); mental health problems (Van Os et al., 2002; Verdoux, Gindre, Sorbara, Tournier & Swendsen, 2002); and suicidal behaviour and deliberate self-harm (Patton et al., 1997).

There are several factors that can influence adolescent initiation and escalation of alcohol and drug use. Influencing factors include genetics, environment (e.g., cannabis availability) and social influences such as parenting and the characteristics of families and peers (Bahr & Hoffmann, 2010; Clausen, 1996; Montgomery, Fisk & Craig, 2008). Although many influencing factors are similar, there is evidence that different factors may influence the development of licit drugs (e.g., alcohol) and illicit drugs (e.g., cannabis) (Hemphill et al., 2011; Kosterman, Hawkins, Guo, Catalano & Abbott, 2000). Peer and individual characteristics such as favourable attitudes, impulsivity, and antisocial behaviour are considered some of the predictors for both
alcohol and illicit drug use in adolescents, while specific peer behaviours (e.g., cannabis use) may predict more specific individual behaviours (Donovan, 2004; Hawkins, Catalano & Miller, 1992; Ryan, Jorm & Lubman, 2010). Availability and access to alcohol, together with social and physical reinforcers such as laws and policies and alcohol marketing are key factors influencing adolescent alcohol use (Toumbourou et al., 2007). As distinct to illicit drug use, alcohol use is common and socially acceptable amongst adults in Australia and hence adolescent motivations to use alcohol may be based on efforts to conform and become like most other adults. The use of illicit drugs may have different motivations signifying deviancy, breaking the law and differentiating from the majority (Toumbourou, 2007).

2.2 Human developmental theories

Developmental theories seek to synthesise knowledge, understand underlying processes and guide interventions to reduce problems and to more fully realise the potential for human development. In the sections that follow key theories will be briefly examined that have relevance to understanding the psychosocial development of adolescents in developed nations.

Erikson’s theory of psychosocial development has been influential in theories of adolescent development and considers identity development to be critical, defining this as the individual’s understanding of their placement within wider social domains (Santrock, 2008). Identity development is increasingly important in individualistic societies where self-directed decision making and self-management is required to wisely utilise social, economic and political rights and freedoms (e.g., Moshman, Glover & Bruning, 1987).
Erikson’s theory of psychosocial development conceptualizes eight stages of lifespan development from birth through to adulthood. The resolution of each developmental stage influences subsequent phases. Identity versus role confusion is the phase that occurs during adolescence, and holds the challenge to develop a stable and healthy personal identity (Santrock, 2008). During this phase the adolescent becomes more psychologically and socially focused, characterised by an increasing level of self-awareness, capacity for self-reflection, and integration of past and current experience in constructing a sense of personal identity (e.g., Adams-Webber, 2000; Liebert, Wicks-Nelson & Kail, 1986). Erikson’s theory recognises the process of identity formation occurring throughout adolescence involves many decisions and “behavioural experiments” and may involve periods characterised by “identity crises”, which when resolved form the basis of adult personality (Hammond & Romney, 1995; Wintre & Crowley, 1993). The theory emphasises that social understanding develops through the change in social role from childhood to adolescence, and through increased opportunity to explore these roles within more diverse social groups (Liebert, et al., 1986).

Physical development theories emphasise the sequencing of the biological and neurological processes underlying human development. The physical processes that have relevance to psychological and behavioural development through the adolescent phase sequence and build on physical development in earlier periods of life (Berger, 2003). Physical development occurs as a complex product of gene-environment interactions (Shanahan & Hofer, 2005). During adolescence the gene-environment sequencing of pubertal development is associated with sex hormones that trigger sexual development and more rapid physical growth. During adolescence the neurological pathways and connections that are utilised within the brain are reinforced, while others that are not used are deactivated (Hermens et al., 2013). In this sense
neural networks are simplified through adolescent development, contributing to the biological basis of identity development and to more advanced capacities for cognitive and behavioural skill development. Changes within the adolescent brain increase the capacity for psychological processes to govern behaviour through processes including self-control, emotion regulation, and more advanced capacities to make judgements and decisions (e.g., Westen, 2002).

The biological embedding of physical development processes refers to the influence that early physical development sequences have on later development. For example exposure to unhealthy nutrition, toxic chemicals, and high levels of stress hormones such as cortisol in the early years can embed problems in the developmental sequence, disrupting healthy physical development resulting in disability and poor outcomes in later life (e.g., Shonkoff, 2009). This means that in some cases children are already experiencing embedded developmental damage and behavioural problems as they enter the adolescent phase, increasing the risk of alcohol and drug problems.

Developmental influences need to be evaluated not simply in terms of their strength at different ages, but also in terms of how common they are across the population. Some influences such as adolescent substance use are common causes of physical changes such as tolerance to alcohol that increase the likelihood of adult substance abuse and related outcomes for large numbers (e.g., McCambridge et al., 2011).

The process of neurological differentiation through adolescence is associated with increases in cognitive and conceptual capacities. Piaget’s theory described four stages of cognitive development across the lifespan. The formal operational stage is the final stage of cognitive development beginning during adolescence and continuing throughout adulthood (e.g., Santrock, 2008; Westen, 2002). Piaget emphasised cognitive development in adolescence in
terms of the capacity to think and reason in a more abstract and complex manner (e.g., Liebert, et al., 1986; Sprinthall & Collins, 1984). The adolescent develops the ability to: think hypothetically; critically reason; generalise beyond experience; apply logic to abstract situations; engage in more complex problem solving; and analyse thought processes (e.g., Liebert, et al., 1986; Santrock, 2008; Sprinthall & Collins, 1984). With increased capacity for complex thinking, the adolescent is expected to take more responsibility for independent choices and actions that affect outcomes such as alcohol and drug use problems.

2.3 The development of adolescent behavioural disorders

At the time the current thesis was developed common child development behaviour problems were defined in the American Psychiatric Association Diagnostic and Statistical Manual (4th Edition) to include conduct disorder and oppositional defiant disorders (American Psychiatric Association, 2000). These disorders often arise when the child is not being parented effectively in the early years (Patterson, DeBarishe & Ramsey, 1990). These child behaviour disorders are predictors of the development of adolescent problem behaviours that are associated with the development of substance use problems.

Richard Jessor (1977) observed that adolescent substance use behaviours such as alcohol and illicit drug use were commonly associated with other behaviour problems and he conceptualised this association as “Problem Behaviour Theory” (Steinberg & Morris, 2001). Jessor noted that youth who reported substance use, often reported other behaviour problems such as violence, antisocial behaviours, sexual risk-taking, delinquency and school problems.
Problem behaviour theory acknowledged these different behaviours clustered together in individuals and peer groups (Jessor & Jessor, 1977).

Problem behaviour theory attempted to identify underlying factors explaining the inter-relationships between different adolescent behavioural problems. Jessor’s (1991) theory emphasised sociological influences and in its most recent formulation organised the main constructs as risk and protective factors (Donovan, 2005; Jessor, 1991). Risk and protective factors are defined in later sections. As they apply to Donovan’s formulation of Jessor’s theory, social controls against involvement in problem behaviour were described to be analogous to protective factors, while factors that instigated problem behaviour were described as analogous to risk factors. Protective factors were identified to include prosocial role models (e.g., peer models for school achievement) and personal and social controls against problem behaviour (e.g., attitudinal intolerance of deviance, or parental sanctions) and support to sustain prosocial commitment (e.g., parental interest in and support for school activities). Risk factors included role models for problem behaviour (e.g., peer models for alcohol use), opportunities to engage in problem behaviour (e.g., greater availability of marijuana and other illicit drugs), and personal and contextual vulnerability for its occurrence (e.g., limited perceived chances for success in life, or peer pressure to use drugs) (Donovan, 2005).

2.4 Social influences and attachments in adolescent development

With respect to adolescent substance use, Erikson’s psychosocial theories of development suggest that the adolescent’s behavioural preferences will be shaped initially by the behaviours and attitudes of early socialising groups, particularly by parents. As adolescent development
proceeds, attitudes and behaviours will be increasingly influenced by socialisation outside of the family within peer groups and through other interactions. Early behavioural choices and attitudes are considered in psychosocial theories to influence later development partly by shaping social identity concepts.

The “Social Development Model” (SDM) (Catalano & Hawkins, 1996) integrated findings and constructs from earlier psychosocial theories including Jessor’s (1991) observations to describe how social attachments influence the development of adolescent attitudes and behaviours. The theory observed that adolescent development occurs in sequences whereby behaviour and relationships in earlier phases influence development in later phases. The theory argues that social bonds or attachments are the critical influence that determines adolescent identification and related attitudes and behaviours. The strength of adolescent social bonds is in turn determined by opportunities, rewards and skills for social bonding with significant others during earlier developmental phases. For example, according to this theory the strength of social bonding with parents will determine the extent to which the adolescent will identify with the alcohol and drug use behaviours advocated and modelled by the parents. The strength of the adolescent’s social bond with parents will in turn be determined by the opportunities to interact in earlier periods of development (e.g., childhood) and the extent to which this was rewarding. This will in part be influenced by the social adjustment and skill of the adolescent or child. As will be discussed in later sections the SDM provides a theoretical basis for understanding longitudinal research that shows that parental nurturing behaviour in younger adolescents can reduce the development of adolescent substance use (Van Der Zwaluw et al., 2008).
2.5 **Ecological systems influences on development**

The interactive nature of modifiable social influences on adolescent biological, neurological and behavioural development suggests the importance of understanding the social context in theorising adolescent development. Developmental systems theories provide a framework for conceptualising how different social influences exert an interrelated influence on adolescent development.

According to Bronfenbrenner’s ecological systems theory (1994) child development occurs in the context of multiple ecological systems, ranged from the microsystem (immediate environment such as family, peer groups and school) and macrosystem which refers to recognised patterns of culture and societal influences (e.g., economy, customs and conventions).

A developing child progresses through his/her specific biological and psychosocial development sequence influenced by the micro social systems that is itself in complex interaction with the macro system. Therefore, the developmental influence on the child at least partly determined by the characteristics and structure of the micro and macrosystems surrounding the child (Bronfenbrenner, 1994).

A macrosystem in ecological system theory may influence child development through general and specific aspects of culture. Important aspects may include belief systems, bodies of knowledge, customs, opportunity structures and life styles that shape practices within the microsystem (Bronfenbrenner, 1994).

As relevant to the development of adolescent substance use, the first and most direct microsystem influencing the child is the family. However, the family is surrounded in a broader macrosystem of influences such as sales outlets for alcohol, and services that support families.
These resources, services and influences often exert their effect at a community level. Beyond community-level influences there are also state and national forces that influence community and family factors. For example to protect public health, policies operate in the state of Victoria in Australia to prohibit adults supplying alcohol to youth under the age of 18 years. Ecological theory acknowledges that there are multiple layers in the levels of influence that impact the development of adolescent substance use behaviour.

Ecological systems theory is relevant to understanding the development of alcohol and cannabis use. As adolescence progresses young people have more independence and more freedom to make choices outside their family. During the teenage years children spend more of their time with their peers, and this increases as an influence on their development. As adolescent development proceeds, systems outside the family increasingly influence the child’s decisions and behaviours.

Wider macrosystem factors influence the capacity of the family and parents to provide a healthy child development environment. A systems approach acknowledges that there are a range of political and economic mechanisms operating at global, national and state levels that can impact on adolescent health issues. For example these include international treaties, and national and state policies and investments. Many factors at the community level mediate the impact of state and national policies. For example, numerous services and policies are coordinated and delivered by regionalised health services, local government and community health services, and through schools (Toumbourou, Olsson, Rowland, Renati & Hallam, 2014).

Earlier family experiences in the child’s development will influence the way that the adolescent approaches social relationships including with peers (Leung, Hemphill & Toumbourou, 2011). These ecological influences therefore need to be studied in terms of their
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reciprocal effects in attempting to disentangle the influence of the family on the child’s development. There are a number of factors within the broader system that influence the development of alcohol and drug use that are important to consider. These can be examined level by level and include factors related to the broader economic and community context, within family factors and parenting, and the peer context (Toumbourou et al., 2014).

Economic factors and the market are examples of ecological influences operating at a high level within the social system exerting influence over large aggregate populations. Lower relative “Socio Economic Status” (SES) (or placement in the hierarchy of the economy compared to others) is associated with a range of child and family problems (Bornstein & Bradley, 2014). Structural inequality and socioeconomic differentials are increasing in Australia and internationally (Office of Economic Cooperation and Development, 2012) and adversely impact children and adolescents and typically require national and state action to be effectively addressed (Toumbourou et al., 2014).

The sale, supply and market for alcohol and illicit drugs are important higher level system factors influencing the development of families and children. Within the ecological systems theory factors such as the availability of illicit drugs and or alcohol influence both parent behaviour and the child’s development. For example, alcohol availability for adolescents is affected by the per capita number of shops selling alcohol (e.g., Rowland et al., 2014) and whether shops sell to underage youth (e.g., Rowland et al., 2014). With cannabis, availability for adolescents can be affected by the number of drug dealers in their community, whether policing policies are effective, and the attitudes and behaviours toward illicit drug use within the community (e.g., Toumbourou et al., 2014). In Australia the major structural national and state-level interventions that have been proposed to protect adolescents and families from alcohol and
drug-related harm are taxation reform to reduce economic access to alcohol and tobacco and increased industry regulation to control the marketing and availability of alcohol and tobacco (Loxley et al., 2004; Vos et al., 2010).

The school is another broader system operating at the community-level that affects the child’s developmental outcomes. School influences can work directly by affecting cognitive development and also by introducing social groups such as teachers and peers that indirectly influence the child. The school policies, teacher training, behaviour management policies, health curricula are examples of modifiable influences within the school that affect the development of adolescent substance use behaviour (e.g., Bond et al., 2004; Toumbourou et al., 2014).

Within the field of human development, ecological systems theories seek to identify not just the key system components but also their interactive contribution to developmental processes. While the patterns of peer substance use within the school is known to influence the likelihood of adolescent substance use behaviour, the effect may be modified by other factors such as parent bonding, family management and broader community norms. At the individual level, whether the child has already initiated conduct disorder problems can affect the future development of behaviour, peer selection, family management and will itself be affected by earlier developmental phases (Disney, Elkins, McGue & Iacono, 1999).

The cultural context within a given community is a potentially important factor that may modify other system influences that impact child development (Rowland, Toumbourou & Stevens, 2003). Australia is a multicultural country experiencing rapid in-migration. Prior studies reveal lower rates of alcohol and drug use (including lower youth rates) amongst Australian residents that were born outside Australia or that speak non-English languages compared with other Australians (Australian Institute of Health and Welfare, 2002; Rowland et al., 2003). The
reasons for the lower rates of substance use are not well understood but are explained by stakeholders to be due to differences in social norms and identity beliefs associated with historical behavioural patterns and conventions in the country of origin (Rowland et al., 2003). Hence the cultural conventions and practices of migrants may serve to modify other system influences such as community availability of alcohol and illicit drugs, peer group behaviours, and school attachment.

Different parenting practices may be an important factor within the cultural conventions and practices of culturally diverse families that may modify other system influences on youth substance use. As they attempt to acculturate (Marsiglia, Nagoshi, Parsai & Castro, 2012) to Australian norms and conventions, new migrants face the challenge to adjust to or adopt the common parenting practices in Australia (Farver, Xu, Bhadha, Narang & Lieber, 2007). By studying the parenting practices of families acculturating to Australian society it may be possible to derive insights into whether parenting has universal or culturally specific effects on adolescent adjustment. The present thesis attempted to further empirical investigation of this area by completing analyses examining differences in parenting practices and their influence on the development of adolescent substance use in culturally diverse families (see chapter seven).

2.6 Family systems and parent influences

The family system is an important component within ecological systems theories of human development. Family and parent education interventions provide evidence that all members of the family system have a potential influence on child development outcomes such as adolescent substance use. Evidence from randomised trials reveals that it is possible to reduce
adolescent substance use by intervening with one parent alone or the couple (Toumbourou & Bamberg, 2008), siblings (Gregg & Toumbourou, 2003) or the child (Bond et al., 2004). Family systems theories are premised on the understanding that family relationship behaviours are of mutual importance to the health and wellbeing of family members (Yuen & Toumbourou, 2011). Family systems interventions may focus on strategies such as increasing parent well-being (Yuen & Toumbourou, 2011) as this is known to influence parenting effectiveness and through this the healthy development of the child.

A number of family systems interventions (e.g., Toumbourou & Bamberg, 2008) assist parents to find balance and consistency in their parenting styles by avoiding being overprotective or over permissive. The family systems interventions recognise that by changing parenting practices it is possible to ultimately change child behaviour. The theory of parent education programs is that by changing parent behaviours it is possible to influence the child’s substance use.

2.7 Baumrind’s parenting styles

Diana Baumrind’s conceptualisation of parenting styles has emerged as an influential framework (Darling, 1999; Darling & Steinberg, 1993). This framework merged theories of parenting that emphasised behavioural control (Watson, 1928) with attachment approaches (Freud, 1933; Rogers, 1960). According to Baumrind (1991), parenting styles consist of two important domains of parenting: parental nurturance and parental demandingness (Bronte-Tinkew, Moore & Carrano, 2006). Parental nurturance refers to being affectionate and responsive in the sense of being attuned, supportive, and accepting of children’s special needs.
and demands. Parental demandingness refers to as behavioural control efforts such as supervision, disciplinary efforts and readiness to confront behaviour problems to bring the child into line with socialisation demands (Baumrind, 1991). Baumrind (1971, 1978) in a number of significant studies, proposed that parenting practices are characterised by these two main dimensions: of nurturance and demandingness (Clausen, 1996). Parents balance these dimensions to adopt “styles” of parenting that impact the healthy development of children. Baumrind proposed that parenting styles could be characterised as authoritative, authoritarian, permissive and neglectful (Montgomery et al., 2008).

The systematic literature review in Chapter four overviews longitudinal studies that measured nurturing and demanding parenting behaviours and or parenting styles to examine their predictive effect on the development of adolescent alcohol and drug use. A total of 23 studies were found that fitted the inclusion criteria. Several studies confirm that parenting behaviours related to nurturance and demandingness demonstrates significant direct associations with the development of adolescent substance use (Adalbjarnardottir & Hafsteinsson, 2001; Chassin, Presson, Sherman & Gonzalez, 2005; Cohen, Richardson & LaBree, 1994).

### 2.8 Prevention science paradigm

The prevention science paradigm has emerged in recent decades as a framework for integrating knowledge from human development studies and longitudinal research and intervention research. The framework follows earlier work (e.g., Donovan, 2005; Jessor, 1991) by utilising information on developmental risk and protective factors to better understand how to reduce influences that cause problems such as adolescent substance use.
The section that follows introduces some constructs in developmental prevention science. These are discussed in further detail in chapter three providing a more detailed account of methodology. Longitudinal studies observe the same individual at different points over time. Predictors are typically measured in early waves of a longitudinal study. Longitudinal studies seek to measure predictors in terms of their tendency to influence higher probabilities of individuals experiencing later outcomes. Predictors are defined where they are associated with a significantly greater likelihood or probability of outcomes being experienced in later waves. Although many predictors are found to be associated with longitudinal outcomes, there are only a limited number of predictors that maintain significant effects in multivariate analyses that adjust or control for multiple predictors. A multivariate controlled analysis can help to establish whether factors have a “direct” influence on an outcome of interest. Where predictors consistently maintain significant effects on longitudinal outcomes in multivariate analyses, there is an increased likelihood that they directly influence the outcome of interest and through this method predictors are identified as potential “risk factors”. Analytic methods have progressed within the prevention science field to enable complex multi-level designs that investigate risk factors not just at the individual level but also in different developmental systems.

The prevention science model uses information on multivariate direct predictors (risk factors) to construct developmental theories. To understand causal processes it is important to go beyond short-listing risk factors, to construct a theory of how the risk factor may influence the outcome. One way of testing causal theories is to conduct intervention studies. An intervention designed as a randomised controlled study can manipulate the risk factor to provide a strong demonstration of its causal influence on the outcome of interest. Proof of an underlying theory of cause is very important to be confident the risk factor is causing the outcome. So part of the
prevention science paradigm is to increase causal understanding of risk processes (Toumbourou et al., 2014).

Within the prevention science paradigm the present study aims to complete a longitudinal study, not an intervention research project. The present study is one step in the prevention science process contributing a longitudinal analysis that can assist in establishing whether a variable may be a risk factor and not just a predictor. This is done through a multivariate analysis of longitudinal data.

The current findings may be subsequently used to design interventions and this may be done in the absence of a causal theory. Studies such as the present one can start the process in the prevention science program that may ultimately lead to a causal understanding that can be used for reducing the problem at a population level.

2.9 Critiques of prevention science

The prevention science approach has been critiqued in areas of the public health sector that focus on alcohol and drug treatment. From this perspective the prevention science approach is recognised as a long term strategy that is poorly fitted to the immediate demands that are imposed on the alcohol and drug treatment sector. The prevention science strategy has the problem that it is not a suitable response to the immediately presenting crisis needs. Criticisms are directed at the prevention science attempt to design intervention targets to reduce the entrenched problem of substance abuse using the long-term strategy of collecting longitudinal survey data recognising that not everyone will participate in school surveys that are a commonly
used form of data. There are many youth that have problem behaviours who are not in schools (Gates, McCambridge, Smith & Foxcroft, 2006).

The prevention science strategy has also been critiqued as not recognising the complexity of differences across the whole community. The criticism from this perspective is that the approach is very culturally specific and has not been designed to take into account cultural differences. Critiques of prevention science point to the need to understand special populations differing in ethnicity (Choi, He, Herrenkohl, Catalano & Toumbourou, 2012).

2.10 Chapter summary

The present chapter examined the role of systems in human development and described cultural, community and family system influences in the development of adolescent alcohol and illicit drug use. Psychological and behavioural human development theories were summarised that have relevance to adolescent development. Systems theory was introduced as a framework for understanding the role of social influences in human development, focussing of community and family systems theories. The chapter finished by describing how the study of developmental processes is applied within prevention science. The next chapter (chapter three) examines methodological issues associated with the empirical investigation of behavioural measures using adolescent self-reports and the use of longitudinal research to investigate human development.
Chapter Three - Methodological Introduction

3.1 Introduction

This chapter provides general information relevant to the methodology of the current study. In what follows literature is examined relevant to the scientific paradigm underpinning the study, the study design choice of a longitudinal analysis of a cluster-randomised school trial is discussed and details are provided relevant to the methodology and analysis.

3.2 Longitudinal risk-focused research

The research undertaken for this thesis employed a longitudinal design to study the consequences of adolescent observations of parent behaviour (independent variable) on the development of adolescent alcohol and drug use (dependent variable). This research design is able to accurately identify the temporal order of the independent and dependent variables and can establish whether the independent variable maintains an influence on the dependent variable, after statistically controlling for other known influences.

The studies of this thesis utilise data from three annual observations of adolescents that were followed over time after their schools were randomly assigned to intervention and control conditions. The analysis of sequential observations is a fundamental feature of the longitudinal research design as it permits the study of behavioural change in the same cohort over time, and the examination of influences, accounting for other known influences (Des Jarlais, Lyles, 

Crepaz, 2004). In spite of the design strengths of longitudinal studies, these studies are essentially observational and non-experimental and hence the findings of these studies must be cautiously interpreted recognising there are many “threats to causal inference” (West & Thoemmes, 2010). Relationships between independent and dependent variables in longitudinal research may arise due to a causal relationship but also due to non-causal explanations such as: (1) common associations with unmeasured factors; and (2) anomalies in the longitudinal design (differential attrition and other problems with internal validity) (Des Jarlais et al., 2005). Interpreting longitudinal associations requires researchers to take into consideration factors that may undermine causal interpretations including the effect of: attrition across time that may result in sample differences that can be misinterpreted as change across time; and extraneous variables that may confound analyses by predicting both the independent and dependent variable and hence need to be controlled in analyses (Von Elm et al., 2008).

The findings of longitudinal research can suggest hypotheses for experimental research that is more suited to causal inference due to design features such as random assignment of subjects to different levels of the independent variable to establish whether there is an effect on the dependent variable. The randomisation of participants to intervention and control groups is recognised as an important strength of the experimental research paradigm as the process of randomisation allows extraneous variables to be controlled in efforts to understand causal influences. Although the present study design included random assignment of schools to a parent education intervention, it was not feasible to randomly assign parents to different levels of parenting styles, the independent variable of interest in the current study.
3.3 Identifying predictors, risk factors and causal influence

In attempting to interpret the findings of longitudinal research it is useful to distinguish between the terms: (1) predictor; (2) risk factor; and (3) causal influence. In longitudinal research a predictor is defined as an independent variable that shows a statistically significant association or correlation with a longitudinally measured dependent variable. A risk factor is a predictor that maintains a significant longitudinal association with a longitudinally measured dependent variable, independent of other known risk factors.

In the present research context a predictor is identifiable in a correlational or unadjusted analysis. A potential risk factor is identifiable based on it increasing the longitudinal probability of adolescent substance use, in a multivariable analysis that adjusts for other known influences. Risk factors are typically demonstrated in systematic literature reviews as factors that consistently maintain significant adjusted effects in meta-analyses of longitudinal studies, after adjusting for other influences.

In order for risk factors to be argued to have causal influences, there needs to be more than an independent association, but also evidence of a theoretical mechanism by which the risk factor directly influences the dependent variable. Beyond the evidence for a risk factor association a causal understanding is required of the risk process or mechanism by which the risk factor affects the outcome. Typically longitudinal studies provide evidence for risk factors that may be hypothesised as causal influences, but additional evidence from randomised trials and causal process research is required to overcome logical threats to causal inference.

In the present study a two-year longitudinal follow-up design was used to evaluate the behavioural impact of “Resilient Families”, a universal intervention in secondary school students
in Melbourne, Australia, that aimed to prevent early initiation and frequent and heavy adolescent substance use. The systematic literature review presented in chapter four showed that there is a lack of longitudinal studies that have examined the predictive association between parenting and adolescent substance use, and that most prior studies have been cross sectional. Prior reviews have concluded that future research to establish whether parenting was a risk factor for adolescent substance required longitudinal study in Australia. A longitudinal design was chosen for the current study to provide a temporal understanding of the relationship between parenting and the outcome of adolescent substance use, controlling for earlier behaviour and other influences.

One of the considerations in designing the present longitudinal study was the period required to measure relevant behaviours. The longitudinal design used to was to observe the effect of parenting on adolescent substance use behaviour involved annual follow-ups over a two year period during the early years of secondary school. Prior studies have observed that substance use behaviours change steadily over the early secondary school period. The amount of change differs for different substances and in different populations. With respect to cannabis use in the Melbourne population being investigated, prior studies suggested that relatively small behavioural changes occurred in cannabis use in the early adolescent population in a single year. Hence, to have sufficient power to measure change in adolescent cannabis use, a two-year study period was selected as appropriate to measure developmental changes in early adolescent alcohol and drug use.

There has been little prior research that has examined the effect of parenting on adolescent substance use behaviour over a two-year period. Demonstrating this effect over a
longer follow up period than a single year was considered advantageous in revealing whether
effects can be observed over this period in this way adding to the existing literature.

3.4 Alternative family and parent observation methods

Measurement methods are an important consideration in the design of longitudinal
behavioural research. One of the measurement methods that could be accounted as a unique
strength of the present study was the use of youth self-report. Youth self-reports are now widely
used in developmental and behavioural research. There are many aspects of youth psychology
and behaviour that can only be reported by the young person themselves, as parents and other
observers such as teachers and friends are unable to report accurately on the subjective
experience, emotions, thoughts and behaviours of the adolescent. Parent observations have been
used to identify parent behaviours in some studies but are likely to provide biased estimates of
factors such as family conflict and parental monitoring of child behaviour. Children can provide
reliable estimates of their own psychological characteristics, especially with respect to
behaviours that may have covert elements such as substance use. Youth self-report data is also
valuable for assessing family characteristics, as children are able to provide unique and valid and
reliable reports of the behaviour of their parents. Youth perceptions of their parent’s behaviour
have been shown in prior research to be stable over time and to strongly predict future youth
outcomes.

There are alternative methods that have been used in prior studies to observe parent
behaviour. The current study used a quantitative approach within a very large sample. Although
more details on the specific characteristics of parenting and substance use could have been
obtained using a qualitative design, the literature review revealed there had been considerable qualitative descriptive research in the past, with researchers calling for further longitudinal quantitative analysis. It would have been possible for the present study to have incorporated alternative quantitative measurement strategies such as: direct observations of parents; and parent-child interactions; and the use of one or more parent reports. In some behavioural research studies different observations are combined to provide a more complex picture of family characteristics.

In the current study youth self-reports were gathered during a single survey. In alternative behavioural research procedures it is possible to conduct multiple observations at weekly or monthly intervals as a more intensive observational follow up. As the aim of the present study was to understand the effect of parenting on the development of adolescent substance use, a follow-up of two-years was selected to enable sufficient change in substance use. As stated above, with substance use behaviours such as cannabis use that occur only within a minority, there was estimated to be too little change under a two year period to enable the sample to have sufficient power to show statistically significant associations. For these reasons the expense of intensive and multiple observations was not considered justifiable to examine the longitudinal associations that formed the focus of the current study.

In summary youth self-report was selected as the primary measurement strategy for the current study. The reason for this design choice were: the existence of an important gap in the literature in studies using this measurement strategy; evidence that youth self-reports are valid and reliable and provide important prediction of future youth outcomes; the potential to use youth self-reports in the future to assess modifiable family risk factors. The current study had available data from parent reports and this was used to examine the validity of youth self-reports.
3.5 Sample design considerations

A potential limitation of the present study was that the sampled schools were selected from a relatively narrow range of schools given that only Government and Catholic schools in metropolitan Melbourne, in Victoria, Australia were sampled. The school sampling approach, described in more detail in later sections, was designed to represent the main types of schools considered suitable for implementing parent education programs in Melbourne. In pilot work completed for the present study, many private non-government schools were found to already offer parent education and hence, were not considered to have high needs for additional support in this area. For these reasons these schools were deliberately excluded from the design of the present study. A stratified-block randomization approach was used to select Government or Catholic schools into the sample within strata to ensure that the full range of socioeconomic disadvantage was represented in the intervention and control conditions.

A secondary aim of the present study was to examine associations between the key variables of interest (parenting behaviour and adolescent alcohol and drug use) and aspects of family cultural variation. Chapter seven provides details of analytic work completed in this area. Given this secondary aim it may have been advantageous to broaden the sample deliberately into a wider range of ethnic groups. This design choice was not selected given the primary aim to examine the broader population selected based on socioeconomic disadvantage and to study the feasibility of whole-population prevention. A key concern that led to the choice not to stratify the sample based on cultural background was the lack of information as to whether such a sample would be willing to engage with the planned intervention activities and whether there may be cultural barriers in reporting parent behaviours and substance use. Although the sample population was restricted, a range of demographic information was collected to enable
comparison with population data and the study of associations between key variables and cultural variation. Student surveys collected information on family demographics including place of birth and languages spoken at home, parental marital status and identification with an Aboriginal or Torres Strait Islander (Indigenous) background. These themes were further explored in parent surveys that also collected demographic and socioeconomic information.

3.6 Developmentally appropriate measurement in behavioural research

The present study recruited students from the same school grade level (Year 7 in 2004) and this restricted the study to a specific age group of students (average age 12). The analysis of a restricted age group of adolescents may be considered a limitation of the present study. Students were chosen from the beginning of secondary school in Victoria. Beginning the study in this age group was considered to have a number of advantages. Firstly, this age point was considered to be a feasible point to assess student’s risk factors for adolescent substance use. If the present study were able to identify self-reported risk factors this information could be useful in future efforts to develop screening tools. As students remain in the same secondary school for a number of years, screening tolls delivered at the start of secondary school could be used to plan preventative programs over a number of years. Secondly, students at the start of secondary school in Victoria were considered to be at a stage of cognitive development where they were able to report complex concepts of their parents’ behaviour. The present study was interested in identifying whether students were able to self-report parenting behaviours in sufficient detail to enable parenting styles to be identified.
Cognitive development is known to continue through the age periods examined in the present study. Piaget identified that children had the capacity for increased cognitive differentiation as they grew from the late childhood “Concrete Operational Stage” (from 7 to 11 years) into adolescence where they were developing into the “Formal Operations Stage” (from 11 to 16 years). The present study was interested in observing to what extent adolescents during the early years of secondary school were able to report on parent and individual health behaviours that formed the focus of the study. According to Piaget, child cognitions become more abstract and logically organised during the Formal Operations Stage. As applied to the present study, this means their ability to discriminate different characteristics in their parents’ increases through these years. This ability has relevance to their ability to understand and respond to the survey items presented in the study. The present study assumed that by age 12, children would be able to discriminate the parent behaviour measures in a form that would enable the latent classes of interest to be modelled with an adequate fit.

In attempting to survey adolescent behaviour the present study had to consider an important literature that has examined behavioural and social survey measurement. According to this literature a satisfactory psychological, social or behavioural measure has to be a reliable and valid measure of the construct being studied. In longitudinal studies, reliability can be measured based both on internal consistency and also the longitudinal stability of the measure.

Prior studies raise important considerations with respect to the reliability and validity of the behavioural measurement of alcohol and drug use in adolescent samples. An important consideration is confidentiality. The reliability and validity of adolescent self-reports of alcohol and drug use has been shown to be increased by adolescent perception that their accounts will be confidential.
Limitations in memory and cognition can represent important barriers to accurate self-reports. Memory limitations can be reduced in behavioural research by limiting questions to more recent behaviour (rather than more distantly past behaviour) and by framing questions using memory queues that anchor responses to salient past events. Respondents have been found to provide accurate recall regarding the specific characteristics of alcohol and drug use behaviour over the past day and week (e.g., occasions of substance use and amounts). This information can be used to queue recall about the general characteristics of use in the past month, year or over the lifetime (e.g., did you use any alcohol?).

An important concept in considering the psychometric qualities of behavioural measures is reliability. Reliability can be measured as the internal consistency of responses to different questions measuring the same behavioural construct. For example questions asking about the frequency of alcohol use last month tend to be highly correlated with questions asking about the quantity of alcohol used on each occasion. Reliability can also be measured as the stability of responses to the same behavioural construct at different time points. For example when respondents are followed longitudinally stability is noted in their tendency to report alcohol use over time. A consistent observation of adolescent alcohol and drug use is that once initiated these behaviours tend to increase in frequency and the amounts used, with patterns of desistence less commonly observed.

Validity is a further concept considered in evaluating the psychometric qualities of behavioural measures. The validity of a measure is evaluated based on different criteria. The content validity of a behavioural measure may be assessed by comparing to different observations. For example by comparing self-report with peer observations of alcohol use last night. Construct validity may be developed by examining underlying associations between
different measures in patterns of correlations or by examining latent factors. For example the young person’s report of conflict in the family due to alcohol may be expected to be associated with alternative reports of family relationship issues. Criterion validity is assessed based on associations between a new measure and established measures of the construct. For example respondent self-reported alcohol use can be examined against biological measures from breath, blood or other physiological samples. Prior research shows that youth self-reports tend to show criterion validity, so long as the period and specificity of recall is narrowly defined and confidentiality is assured.

3.7 “Resilient Families” study design

The sections that follow provide more detailed information regarding the “Resilient Families” study design.

3.7.1 Study design

As an intervention supplementing standard school practices, the study aligned with definitions of a “pragmatic trial”. Thirty-nine secondary schools in Melbourne, Australia were approached to participate in a cluster-randomized prospective trial (Australian Clinical Trial Registry Number: 012606000399594). The approached schools were randomly sampled using a probability proportionate to grade-level size procedure from a separate project, the “International Youth Development Study” (IYDS). The sampled IYDS schools were state-representative, based on comparison with available measures of school type (Government, Catholic, and Independent), economic disadvantage and student ethnic diversity. A random sub-sample of Melbourne metropolitan schools participating in the IYDS was approached. A stratified-block
randomization approach was used, with strata defined by school type (Government or Catholic), level of entitlement to educational maintenance allowance (a surrogate measure of socioeconomic status) and single-sex schools within Catholic schools. Schools were entered into the sample within strata until twelve were recruited in each condition. Twenty schools were approached to participate in the regular practice comparison condition, and 19 for the intervention condition and 62% agreed, with no significant differences in refusal rates between conditions. Refusals were higher amongst Catholic schools in the intervention condition (6/7) compared to the control condition (4/8). Refusals were low amongst the top third disadvantaged schools in the intervention (0/7) and control (1/8) conditions. None of the recruited control schools was geographically proximate to the intervention schools, reducing the prospects of cross-school transmission of intervention resources (Toumbourou, Gregg, Shortt, Hutchinson & Slaviero, 2013).

Ethics approval was granted from the University of Melbourne’s Human Research Ethics Committee and relevant education authorities, requiring active consent for participation from parents and students. Intervention parents and students were informed the intervention was being conducted, as blinding was not feasible. The control schools were monitored based on usual practice, and uniform questionnaires were used in control and intervention schools, the project being described as a family relationships study.

3.7.2 Participants

Power analyses based on an earlier study provided figures for school and student sample sizes. Figure 3.1 presents the CONSORT diagram showing subject recruitment and participation rates. The total eligible population (n = 4,564) within the 24 participating schools comprised students in the first year of secondary school (Year 7) in 2004 (n = 4,404). Parents were mailed a
consent form and an information sheet. One or more valid surveys (based on signed parent
consent, student consent and survey completion) were obtained from 2,356 students (53% of
approached sample) in the 2004 survey. Students completed surveys in Wave 1 (average age
12.3 years, Year 7 in 2004), Wave 2 (average age 13.4, Year 8 in 2005) and Wave 3 (average age
14.5, Year 9 in 2006). Project staff administered questionnaires to students in regular classroom
periods and later to students who were absent. Analyses were based on N = 2,081 (88% of
recruited sample participating in Wave 1 and Wave 3). STATA “proc ice” develops regression
equations to predict missing variables under varied starting assumptions and was used to
estimate missing data within a scale where most items in the survey wave had been accurately
completed (Toumbourou et al., 2013).
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Eligible schools randomly allocated from the Melbourne International Youth Development Study schools (n=39)

Schools invited to participate in control group condition (n=20)

Comparison schools not interested (n=8)

12 comparison schools agreed to participate

2416 potentially eligible students in 12 comparison schools

808 parent/s refused consent
369 consent form not returned

10 eligible students left study

Wave 1 Survey: 1229 eligible students
1218 (99%) participated
1213 (99%) analysed

72 potentially eligible students approached, 27 joined

91 students joined (inc 27 new)

Absent: 9
Refused: 2
Invalid: 4
Incomplete: 1

Wave 2 Survey: 1225 eligible students
1210 (99%) participated
1206 (98%) analysed

46 students joined study
64 students left study

Wave 3 Survey: 1207 eligible students
1179 (98%) analysed

Absent: 17
Refused: 11

Schools invited to participate in intervention condition (n=19)

Intervention schools not interested (n=7)

12 intervention schools agreed to participate

1988 potentially eligible students in 12 intervention schools

581 parent/s refused consent
273 consent form not returned

7 eligible students left study

Wave 1 Survey: 1127 eligible students
1110 (98%) participated
1108 (98%) analysed

88 potentially eligible students approached, 39 joined

96 students joined (inc 39 new)

Absent: 17
Refused: 0
Invalid: 2
Incomplete: 0

Wave 2 Survey: 1131 eligible students
1115 (99%) participated
1109 (98%) analysed

55 students joined study
50 students left study

Wave 3 Survey: 1136 eligible students
1106 (97%) analysed

Absent: 18
Refused: 12

Figure 3.1. CONSORT Diagram describing participant involvement in the study. Adapted from “Reduction of adolescent alcohol use through family–School intervention: A randomized trial, by Toumbourou et al., 2013, Journal of adolescent health, p. 780”
3.7.3 Program implementation and fidelity

All 12 intervention schools provided release time so that teachers could attend the 2-hour professional development session for teaching the resilient families 'Student Curriculum'. Ten schools delivered the curriculum in either Term 2, 3 or 4 during 2004 and two schools chose to implement the program with their Year 8 students during Terms 1 and 2 in 2005. The program was well received by teachers and students, and integrity checklists completed by teachers indicated that the program was implemented as intended. Five of the intervention schools attempted to implement a system to facilitate contact among Year 7 parents during the first year of the program (2004). Seven intervention schools were unwilling to implement such a system because they had either tried a similar system before and found it to be ineffective, or because they doubted it would be effective based on their experience of parents at the school. Four of the five schools that attempted implementation found that only a small number of parents returned a completed form with their contact details provided. Consequently, a functional contact system could not be established. In sum, only one of the 12 intervention schools was able to establish a functional contact system for parents.

The intervention comprised five components: (1) teacher-led student curriculum (described in more detail below) covering relationship problem solving, family rules and responsibilities, communication, emotional awareness, peer resistance skills and conflict resolution; (2) brief parent education evening facilitated by an adolescent-health expert - a 2-hour “Parenting Adolescents Quiz” (PAQ) providing a fun, social evening for parents/carers to work together and learn ways to promote healthy adolescent development by addressing topics such as youth culture, communication, depression, sibling rivalry, alcohol and drugs, and conflict resolution; (3) extended parent education comprising 8 x 2-hour group sessions for parents/carers
using the parenting program “Parenting Adolescents: A Creative Experience” (PACE), facilitated by a trained parent educator and including topics on listening, assertion, adolescent development, conflict resolution, resilience, drugs and alcohol, and family; (4) building a community of parents - reviewing existing policies and practices for parent engagement at the school and creating opportunities for parents/carers to build support networks in the early years of secondary school; (5) school-wide distribution of a handbook for parents/carers, combining evidence-based information and practical parenting strategies. A comprehensive description of the intervention and intervention exposure and fidelity is provided elsewhere (Toumbourou et al., 2013).

3.7.4 Measures

A detailed description of scales and items is provided elsewhere. The internal reliability of all scales was considered acceptable for an epidemiological analysis (alpha 0.62 - 0.84). Unless otherwise stated, scales and items were drawn from the IYDS survey. As was discussed above, in order to establish that parenting factors were risk factors, their longitudinal association with adolescent substance use had to be maintained after adjusting for other known influences. The present analyses were adjusted for a range of predictors of adolescent alcohol and drug use. Wave 1 modifiable family predictors included family attachment, family conflict and poor family management (i.e., lack of monitoring and clear rules). Adolescent aggression towards parents was adapted from a previous scale. Two new 5-item scales were devised to measure family connection to community (e.g., my parent(s) know other parents at the school) and family connection to school (e.g., my parent(s) attend parent teacher evenings; my parent(s) think school is important). Intervention exposure was indexed by a dichotomous variable measuring school assignment to the intervention (Toumbourou et al., 2013).
Demographic measures included female gender (i.e., reference category male), age 13 years or older (13+, ref: younger ages), non-Australian country of birth, parental marital status (separated or divorced, ref: other categories), and having no older siblings (ref: one or more).

Behavioural Predictors included externalizing behaviour problems, combining conduct problems items from the “Strengths and Difficulties Questionnaire” (SDQ) with a series of IYDS antisocial behaviour items (Toumbourou et al., 2013).

School and Peer Factors included a single-item measure of low academic grades.

### 3.8 Analysis

STATA software (12.0) was used to conduct regression analyses predicting alcohol and drug use, in Year 9 from predictors measured in Year 7. Analyses used the STATA “svy” command to adjust for within-school clustering of classroom responses. Logistic regression models examined predictors of the progression in alcohol and cannabis use, controlling for Wave 1 alcohol and cannabis use. Odds ratios and 95% confidence intervals (CI) are reported. Logistic regression was used in separate models to predict alcohol or cannabis use. Multi-nominal regression was used in a separate model to compare non-users with cannabis users and with alcohol users that did not use cannabis.

A key aim of the current study was to compare the predictive effect of adolescent self-reports of parenting style with the effects of reports of parenting behaviours. “Latent Class Analysis” (LCA) was used to convert the specific measures of parent behaviour by identifying higher order associations in measures of parenting styles.
In previous literature alternative methods for identifying underlying groups with common item response patterns have included the use of cluster analysis and intuitive classes (observation classification). LCA was selected in the present study because it provides a model fit criteria for how well the categorisation fits the data as well as testing between a range of options of how the data could be modelled. LCA was used to achieve this in the current study by fitting a different number of classes and then comparing fit statistics to identify the best fitting model. This method provided information that enabled a rationale for making choices between alternative model classes. LCA provides a unique fit statistic that you don’t get using other methods.

3.9 Chapter summary

The present chapter provided technical information relevant to the methodology of the current study. Literature was examined relevant to: the scientific paradigm underpinning the study; the study design choice of a longitudinal analysis of a cluster-randomised school trial; and details were provided relevant to the methodology and analysis. In the next chapter a systematic review is presented examining

The role of systems in human development and described cultural, community and family system influences in the development of adolescent alcohol and illicit drug use. Psychological and behavioural human development theories were summarised that have relevance to adolescent development. Systems theory was introduced as a framework for understanding the role of social influences in human development, focussing of community and family systems theories. The chapter finished by describing how the study of developmental processes is applied within prevention science. The next chapter (chapter three) presents a systematic literature review of parenting behaviour as a longitudinal predictor of adolescent substance use.
Chapter Four - Systematic Literature Review of Parenting

Behaviour as a Longitudinal Predictor of Adolescent Substance Use

This chapter has been prepared to be submitted to the International Journal of Behavioural Development.
Abstract

Adolescence can be a challenging stage in human development for both parents and children. Baumrind has persuasively argued that the developmental transitions required in this period of life are facilitated by parenting behaviours “parenting styles” that balance nurturance with reasonable demands. Baumrind’s classic contentions have given rise to a number of longitudinal research studies investigating influences on adolescent development. Although adolescent alcohol and drug (substance) use has been the outcome predicted in a number of studies, a systematic literature review is lacking. The present paper presents a systematic review of published longitudinal studies to establish firstly whether Baumrind’s core dimensions of parenting (responsiveness [also referred to as nurturance or support] and demandingness [control]) and their cross-dimensional categorisation of parenting styles have been reliably identified in empirical models. The second aim was to establish whether Baumrind’s parenting dimensions and derived categories of parenting styles have been shown to consistently predict the development of different forms of adolescent substance use at different developmental periods. Thirdly we examined whether findings were similar in nations outside the USA. Finally the findings of prior longitudinal research were integrated into a proposed “Family Influences Model”.

Keywords: Parenting style, Adolescence, Problem behaviour, Substance use
4.1 Introduction

Adolescence represents an important period of developmental transition, with adjustment through this period influencing the course of adult development. Erikson’s psychosocial stage theory emphasised identity formation as a critical adolescent challenge (Erikson, 1963). Since the 1960s adolescent identification with lifestyles that include health compromising behaviours such as substance abuse have formed an increasing public health concern.

Drug and alcohol use is a major preventable public health problem responsible for around one-third of all deaths and a substantial contributor to preventable disability for young people internationally (Toumbourou et al., 2007).

Research to date indicates there is a complex range of potentially preventable influences that underlie adolescent substance use initiation and progression to related-harms. Reviews of longitudinal and intervention research have identified influences that increase the likelihood of adolescent substance use to include genetic propensity, sensation seeking and impulsive personality traits, exposure to substance using peers, community availability of substances, school disengagement, and family factors (Dishion, Capaldi & Yoerger, 1999). Havighurst (1972) argued that psychosocial adjustment through adolescence involved a transition to new social relationships with parents and peers. On the one hand adolescents tend to treat parents’ values as a reference in forming their own values (Havighurst, 1975). On the other hand adolescents are attempting to develop their own standards and attitudes by disengaging from their family of origin (Blyth, Bamberg & Toumbourou, 2002). Within the family environment parenting behaviours are amongst the more important factors that come to influence the extent of adolescent identification with parental values and behaviours and hence are seen as modifiable
influences affecting adolescent substance use (Johnson & Pandina, 1991). There are a number of factors that influence parenting behaviours. Parenting is influenced by both child and parent characteristics including child behaviour, parent finances and related resources, attitudes and education (Brody & Ge, 2001; Dishion et al., 1999; Kosterman et al., 2000).

4.2 Parenting styles

Evidence that parenting behaviours may influence adolescent development has given rise to efforts to understand the parenting characteristics that may be important. As early theories of parenting came to be influenced by theoretical conceptions of behavioural control (Watson, 1928) and psychodynamic attachment (Freud, 1933; Rogers, 1960), a number of observers developed parenting behaviour classifications that included aspects of the control and nurturance dimensions (Darling & Steinberg, 1993). For a period there was a gap between the study of socialization goals and the study of socialization techniques until Baumrind developed her conceptualisation of parenting styles in 1966 which came to be very influential (Darling, 1999; Darling & Steinberg, 1993).

4.2.1 Baumrind’s parenting socialisation model

Baumrind advocated socializing children to conform to the necessary demands of others while maintaining a sense of personal integrity to be a key challenge within the parental role (Darling & Steinberg, 1993). Baumrind has been a seminal figure in the characterising of parenting styles. According to Baumrind (1991), parenting styles consist of two important domains of parenting: parental responsiveness and parental demandingness (Bronte-Tinkew et al., 2006). Parental responsiveness refers to being attuned, supportive, and accepting of
childrens’ special needs and demands. Parental demandingness (or behavioural control) refers to supervision, disciplinary efforts and readiness to confront behaviour problems to bring the child into line with socialisation demands (Baumrind, 1991).

Baumrind (1991) conceptualized the two major parenting domains to represent two central and independent domains by which two key parenting tasks could be cross-categorised. Baumrind (1991) categorised parents according to the degree of demandingness and responsiveness and thereby created four clusters of “parenting styles” namely: (a) the authoritative parenting style, (b) the authoritarian parenting style, (c) the indulgent or permissive parenting style, and (d) the uninvolved or neglectful parenting style (See Figure 4.1) (Bronte-Tinkew et al., 2006). Each category has a different pattern of parenting practices and communication patterns (Baumrind, 1991). Both the parents’ responsiveness and demandingness are components that influence the development of children.

<table>
<thead>
<tr>
<th>Major Parental domains</th>
<th>Nurturance</th>
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<tr>
<td></td>
<td>High</td>
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<td>Demandingness</td>
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<td>High</td>
<td>Authoritative</td>
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<tr>
<td>Low</td>
<td>Indulgent/Permissive</td>
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</table>

*Figure 4.1. Four clusters of parenting styles based on the level of demandingness and nurturance. Adapted from “Socialization in the context of the family: parent–child interaction, by Maccoby and Martin, 1983, Handbook of Child Psychology”*

Baumrind (1989) conducted a small longitudinal study to examine the influence of parenting styles on adolescent competence and substance use. The participants were first studied
at age 4, then at age 10 and finally at age 15. At age 15, the sample included 139 adolescents and their parents who were from middle class, well-educated, Caucasian families residing in San Francisco. She found that parents with authoritative parenting styles (highly demanding and responsive), were more successful in protecting their adolescents from drug use problems relative to authoritarian parents. Authoritarian parents, when compared to authoritative parents, were found to be more restrictive, conventional, and less supportive. The adolescents of authoritarian parents tended to display more internalizing problem behaviour such as disruptive emotional responses (Baumrind, 1991). A number of longitudinal studies have followed after Baumrind that investigated the prospective relationship between parenting style and adolescent development. However, there has been no empirical review of these studies to date.

### 4.3 Aims of the present chapter

The present chapter completed a systematic review of relevant longitudinal studies to examine whether the protective effects of key parenting domains outlined in Baumrind’s theory of parenting have been upheld in studies published since her seminal report. The first aim was to examine the hypothesis that the key dimensions of parenting style identified by Baumrind will have been confirmed in subsequent research. The second aim was to examine the longitudinal influence of parenting dimensions and styles on adolescent substance use. It is hypothesised that the Baumrind’s findings would be replicated in that the key domains of demanding and responsive parenting and the derived categories of authoritative parenting style would consistently predict lower rates of the development of adolescent substance use in relevant longitudinal studies. Thirdly, it’s aimed to examine whether similar parenting styles and predictive relationships are identifiable in cultures outside the predominantly white United States
populations that Baumrind initially studied. It’s hypothesised that effects would be similar regardless of parent ethnicity defined with respect to the culture and birthplace of the parent. Finally it’s aimed to integrate the longitudinal findings into a proposed “Family Influences Model”.

4.4 Method

To find relevant studies, a literature search was conducted using the electronic abstraction services of PubMed, CINHAL, Medline, Academic search complete, Academic search premier, EBSCOHost Electronic Journals Service, Expanded Academic ASAP, Psychology: a SAGE Full-text collection, Psychology and behavioural sciences collection, PsycINFO, Academic Search Premier, EJS E-Journals, Clinical Reference Systems, Psychology and Behavioural Sciences Collection, PsycARTICLES and Database of Abstracts of Reviews of Effects. The selection criteria for this review focused on peer refereed empirical papers that included the following:

Has been published between 1989 and 2012 in English; Have a longitudinal design; Include a representative community sample of adolescents aged 10 to 18 years at baseline; Include a measure of parenting style as the independent variable; Include a dependent variable (follow-up measure) relevant to adolescent alcohol and or drug use.

Based on inspection of retrieved abstracts, 29 articles appeared to meet the inclusion criteria and were included for critical appraisal. Of these a total of 23 were retained. Papers were rejected where analyses were not longitudinal, a relevant parenting measure was not included as a predictor or substance use was not included as an outcome. 15 of the 23 included articles
categorized parenting styles using Diana Baumrind’s clusters, while the remaining eight included at least one of the Baumrind domains. These studies used a wide variety of measures of parenting styles on which to categorise parents.

4.5 Results

Table 4.1 summarises the basic information of the longitudinal studies included in the present review. Independent variables (IV) and dependant variables (DV), sample size, age at baseline and follow up, sample characteristics and key findings are summarised as relevant to the prospective relationship between parent behaviours and adolescent substance use.

Relevant to the first aim of the current review, 21 of the 23 studies presented at least partial evidence to confirm that the parenting dimensions identified by Baumrind could be reliably identified. In all but one of the reviewed studies, adolescent reports were the major source used to assess the parental behaviour, with parent report used in the remaining study.
## Table 4.1

<table>
<thead>
<tr>
<th>Author</th>
<th>Date</th>
<th>Sample size</th>
<th>Follow-up Rate</th>
<th>Method</th>
<th>Baseline Age</th>
<th>IV</th>
<th>Follow-up Age</th>
<th>DV</th>
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<tbody>
<tr>
<td>Adalbjarnardottir et al.</td>
<td>2001</td>
<td>579/1293</td>
<td>347</td>
<td>Males &amp; females, students from compulsory schools in Reykjavík, Native Lutheran Icelanders</td>
<td>14</td>
<td>Alpha (&gt;0.75) supported the internal consistency of adolescent reports of responsiveness and supervision. The dimensions were correlated .43. Used one-third splits to form parenting style extremes. Parenting style: Authoritative, Authoritarian, Indulgent, Neglectful (Parental: responsiveness, affection, involvement, monitoring and supervision)</td>
<td>17</td>
<td>Adolescent Substance use (Cigarette smoking, Alcohol use, Illicit drug use)</td>
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<td>Aquilino &amp; Supple</td>
<td>2001</td>
<td>1066</td>
<td>1066</td>
<td>Male &amp; female Dataset was adopted from the first and second waves of the NSFH in US Black and Hispanic</td>
<td>12-18</td>
<td>4 dimensions were used to measure parenting style as reported by parents: parental warmth-support (7-item, α = .77), democratic discipline (2-item, α = .36), parental restrictiveness supervision (7-item, α = .67) and parental coercive control and conflict (12-item, α = .67), Adolescent behaviour</td>
<td>18-24</td>
<td>Depressive symptoms, Hostility, irritability, Self-esteem, Personal efficacy, Life satisfaction, Risk-taking behaviour (measured by the frequency of alcohol, cigarette and marijuana use in the past year and frequency of binge drinking)</td>
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<td>3. Barnes et al.</td>
<td>2000</td>
<td>699</td>
<td>506</td>
<td>Male &amp; female, from metropolitan Buffalo/New York, black &amp; white</td>
<td>Parental support (nurturance), (alpha = 0.8), parental monitoring (control) (alpha = 0.64). Nurturance significantly predicted monitoring (beta = 0.36)</td>
<td>13–16</td>
<td>Alcohol misuse (quantity, frequency aggregate) intercept and slope calculated using latent growth curve modelling</td>
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<td>4. Brody &amp; Ge</td>
<td>2001</td>
<td>175</td>
<td>120</td>
<td>Males &amp; female, From 12 nonmetropolitan counties in Georgia Caucasian families</td>
<td>Mothers’ and fathers’ nurturant-responsive parenting measured by summing standardised scores based on information provided by the children and observers (8 items, α &gt; .75 for each scale). Mothers’ and father s’ harsh-conflicted parenting Child self-regulation</td>
<td>11-12</td>
<td>Two years later (14 years)</td>
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<td>5. Brody et al.</td>
<td>2009</td>
<td>298</td>
<td>289</td>
<td>Males &amp; females, Residing in rural Georgia, African-American</td>
<td>Demographics, Involved-supportive parenting (measured with mother responses to 20 true or false items, α = .84)</td>
<td>11 (average 11.5)</td>
<td>12, 13 and 14</td>
<td>Substance use</td>
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<td>6. Chassin et al.</td>
<td>2005</td>
<td>556</td>
<td>382</td>
<td>Male &amp;female, Non-Hispanic white (98%)</td>
<td>Parental acceptance (nurturance, warmth, At baseline assessed both adolescent and parent reports of maternal behavioural control and acceptance (alphas &gt; 0.77).</td>
<td>10 –17</td>
<td>12- 19</td>
<td>An increase in tobacco use at 2-year follow up</td>
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<td>Author</td>
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<td>report was low (kappa = .13)</td>
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<td>7. Cohen et al.</td>
<td>1994</td>
<td>1034 5th</td>
<td>466 + 538</td>
<td>Male &amp; female, 2 public school districts in Southern California,</td>
<td>5th &amp; 7th</td>
<td>Child reports of Parenting</td>
<td>8th &amp; 9th</td>
<td>Aggregate variables</td>
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<td>8. Coker &amp; Borders</td>
<td>2001</td>
<td>24,599</td>
<td>17,424</td>
<td>Total of 1052 schools in America were selected through stratified</td>
<td>8th grade</td>
<td>Parental support, Parental</td>
<td>10th grade</td>
<td>Onset of substance use</td>
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<td>9. Dishion et al.</td>
<td>1999</td>
<td>206/277</td>
<td>173</td>
<td>Male, from Oregon Youth Study (from schools in the higher crime areas</td>
<td>10</td>
<td>Aggregate variables measured parent and intervewer-reports of</td>
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<td>Author</td>
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<td>10. Engels et al.</td>
<td>2005</td>
<td>788</td>
<td>301</td>
<td></td>
<td>9-16 (M=12)</td>
<td></td>
<td></td>
<td>Childhood Aggression,</td>
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<td>Male &amp; female,</td>
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<td>Parenting Practice:</td>
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<td>Families from all Dutch</td>
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<td>Affection, Responsiveness</td>
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<td>municipalities (in terms of</td>
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<td>(alpha = 0.87 (mother),</td>
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<td>region and degree of</td>
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<td>0.87(father), 0.83(child</td>
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<td>urbanisation) with children</td>
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<td>child about father),</td>
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<td>aged 9-16</td>
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<td>0.78(child about mother)),</td>
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<td>Strict control (alpha =</td>
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<td>0.73(child about mother)),</td>
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<td>Family functioning</td>
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<tr>
<td>11. Ennett et al.</td>
<td>2001</td>
<td>662/1316</td>
<td>537</td>
<td></td>
<td>12-14</td>
<td></td>
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<td>Parent-child communication,</td>
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<td>Parent drinking and</td>
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<td>a family-based intervention to</td>
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<td>parental disapproval of</td>
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<td>and alcohol use</td>
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<td>Tobacco and Alcohol,</td>
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<td>Non-Hispanic white and black,</td>
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<td>Parents supportiveness</td>
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<td>Hispanic and other race &amp;</td>
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<td>(8-item, alpha = 0.63) &amp;</td>
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<td>ethnicities</td>
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<td>Parents monitoring (7-item,</td>
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<td>alpha = 0.50), Demographic</td>
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<td>characteristics</td>
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<tr>
<td>12. Getz &amp; Bray</td>
<td>2005</td>
<td>4088</td>
<td>3675</td>
<td></td>
<td>12-13</td>
<td></td>
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<td>Demographic factors,</td>
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<td>Male &amp; female,</td>
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<td>Family process and</td>
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<td>Students from a large</td>
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<td>parental, alcohol</td>
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<td>South-Western urban area of</td>
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<td>behaviour (family conflict,</td>
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<td>America,</td>
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<td>mother’s monitoring,</td>
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<td>Non-Hispanic White,</td>
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<td>mother’s alcohol use),</td>
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<td>Middle school-aged</td>
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<td>Parental monitoring (7-item,</td>
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<td>(12-13)</td>
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<td>alpha =</td>
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</table>

- 0.21 (Look at Dishion et al. Table 3, P. 193)
- Problem drinking (Alcohol consumption)
- Adolescent smoking and drinking initiation and escalation
- Heavy alcohol use (assess the average quantity of alcohol beverages consumed during previous month), Marijuana use, Deviant behaviour
### Author: Huh et al. 2006
- **Sample size:** 496
- **Follow-up Rate:** N/A
- **Sample:** African American, Mexican American, Asian or Pacific Islander, Africa Americans, Caucasians, Latina, Native Americans, other specified
- **Baseline Age:** 11-15 (M=13)
- **IV:** Perceived Social support. Parental control assessed with 6 items (alpha = 0.91), Perceived parental support assessed with 6 items (alpha = 0.89)
- **Follow-up Age:** 1 year follow-up (From T3 to T4)
- **DV:** Substance abuse (drug and alcohol), Externalising symptoms

### Author: Jackson et al. 1999
- **Sample size:** 488/682
- **Follow-up Rate:** 488
- **Sample:** Male & female, 12 elementary schools in central North Carolina, high/middle/low income areas, English as their first language, White, black & other ethnic groups
- **Baseline Age:** 5th grade (age 10)
- **IV:** Used the Authoritative Parenting Index (Jackson et al, 1998) to obtain children’s ratings of maternal responsiveness (alpha =0.87) and demandingness (alpha =0.73)
- **Follow-up Age:** 2 Years later (7th grade, age 12)
- **DV:** Alcohol use in the past 30 days
<table>
<thead>
<tr>
<th>Author</th>
<th>Date</th>
<th>Sample size</th>
<th>Follow-up Rate</th>
<th>Method</th>
<th>Baseline Age</th>
<th>IV</th>
<th>Follow-up Age</th>
<th>DV</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. Kosterman et al.</td>
<td>2000</td>
<td>808</td>
<td>N/A</td>
<td>Male &amp; female, Schools of high crime neighbourhood in Seattle White American, African-American, Asian-American, Native American &amp; other racial groups, low income</td>
<td>10</td>
<td>Six items measured proactive family management (demandingness) measured as parents’ monitoring, rules, discipline, reward practices (av., alpha = 0.69). Two items measured bonding to mother (responsiveness)</td>
<td>18</td>
<td>Alcohol and marijuana initiation</td>
</tr>
<tr>
<td>16. Latendresse et al.</td>
<td>2008</td>
<td>N/A</td>
<td>4731</td>
<td>Twins identified through Finland’s central population registry</td>
<td>11 to 12</td>
<td>Parental alcohol use, Adolescent perceived home atmosphere (parental warmth (4-item, alpha = 0.79), relational tension between adolescent and parents, parental practice), Shared activities with parents, Autonomy granting in parent-adolescent relationships, Perceived Parental Discipline (2-item, alpha = 0.52), Parental Monitoring (4-item, alpha = 0.73)</td>
<td>At 14 and later on 17.5 years of age</td>
<td>Adolescent alcohol use</td>
</tr>
<tr>
<td>17. Nash et al.</td>
<td>2005</td>
<td>2573/3620</td>
<td>77%</td>
<td>Male &amp; female, From 11 high school in 6 distinctions in Houston, US, Predominantly lower to middle class, Non-Hispanic white, African-</td>
<td>9th grades Age 14.5</td>
<td>Parental expectations of adolescent’s alcohol use, Perceived acceptance by parents (5-item, alpha = 0.93 &amp; 0.94 for mothers and fathers), Parental monitoring (7-item, alpha = 0.82 &amp; 0.89 for mothers and</td>
<td>10th grades (M=15.5)</td>
<td>Alcohol use frequency, Alcohol use quantity, Frequency of alcohol problems</td>
</tr>
<tr>
<td>Author</td>
<td>Date</td>
<td>Sample size</td>
<td>Follow-up Rate</td>
<td>Sample</td>
<td>Method</td>
<td>Baseline Age</td>
<td>IV</td>
<td>Follow-up Age</td>
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<tr>
<td>18. Pires &amp; Jenkins</td>
<td>2007</td>
<td>3434</td>
<td>2194</td>
<td>Male &amp; female, Dwellings were selected from each cluster from each Canadian province divided into geographic area clusters.. Canadian, European &amp; Minority (i.e., Native Indian, Black, Asian)</td>
<td>10</td>
<td>Affect (rejection and warmth) in parenting ($\alpha = .59, .70, .73$ for the parental rejection 6-item scale, and .76, .86, .88 for the parental warmth 6-item scale, for cycles 1, 2 and 3, respectively), ADHD symptomatology, Deviant peer affiliation</td>
<td>16-17</td>
<td>Adolescent drug use (Marijuana, glue use, other: hallucinogens, crack, cocaine, other non-prescribed drugs)</td>
</tr>
<tr>
<td>19. Shucksmith et al.</td>
<td>1997</td>
<td>627 &amp; 595</td>
<td>339 &amp; 206</td>
<td>Male &amp; female, 10 randomly selected secondary schools spread throughout Scotland</td>
<td>13/14 &amp; 15/16</td>
<td>Parental support &amp; parental control (Authoritative, permissive, authoritarian, neglectful and other moderate families), Perception of relationship with parents</td>
<td>15/16 &amp; 17/18</td>
<td>Frequency of drinking alcohol</td>
</tr>
<tr>
<td>20. Steinberg et al.</td>
<td>1994</td>
<td>6500/10,000</td>
<td>4757/6500</td>
<td>Male &amp; female, 3 high school in Wisconsin &amp; in Northern California, European-American, Asian-American, Hispanic-American, All High school grades</td>
<td>Demandingness measured using a 5-item parental monitoring scale, Peer influence</td>
<td>One year later (two school years)</td>
<td>Frequency “severity” of adolescent poly substance use (different forms of substance use)</td>
<td></td>
</tr>
<tr>
<td>Author</td>
<td>Date</td>
<td>Sample size</td>
<td>Follow-up Rate</td>
<td>Method</td>
<td>Baseline Age</td>
<td>IV</td>
<td>Follow-up Age</td>
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<td>21. Stice et al.</td>
<td>1998</td>
<td>216</td>
<td>216</td>
<td>Male &amp; female, Hispanics, non-Hispanic Caucasians, COAs</td>
<td>12-17 (M=14.2)</td>
<td>Externalising symptoms, Internalising symptoms, Parental alcoholism, Peer influences, Impulsivity, Parental approval of alcohol use, Parental support (6-item, α = 0.88 for adolescent report, α = 0.82 for mother report) and Parental control (10-item, α = 0.89 and 0.84 for mother report)</td>
<td>1 year</td>
<td>Adolescent reported frequency of alcohol use</td>
</tr>
<tr>
<td>22. Van der Zwaluw et al.</td>
<td>2008</td>
<td>428</td>
<td>404</td>
<td>Male &amp; female, Dutch families</td>
<td>15.2 &amp; 13.4 (mean age)</td>
<td>Parental problem drinking, Parental behavioural control (5-item, α = 0.71 – 0.90) Parental support (12-item, α = 0.76 – 0.88), Alcohol-specific parenting</td>
<td>2 years (3 waves)</td>
<td>Adolescent alcohol use (Consumption in previous week)</td>
</tr>
<tr>
<td>23. Webb et al.</td>
<td>2002</td>
<td>1672</td>
<td>1126</td>
<td>Males &amp; females, students in 7th to 10th grades from 4 suburban school districts near Houston/Texas, White, black &amp; Hispanic</td>
<td>11-17</td>
<td>Perceived parental monitoring (demandingness) measured using 7-item scale (α &gt; 0.70)</td>
<td>One year later (12 18)</td>
<td>Frequency of alcohol use, Externalizing behaviour (delinquent and aggressive behaviour)</td>
</tr>
</tbody>
</table>
4.6 Identification of the key dimensions of parenting style

In overview, the findings reveal that parenting style categories have not been identified using consistent and reliable methods. The available studies examined the reliability of child reports of parenting by reporting the internal consistency of items indicating each of the parenting domains. In most studies, Cronbach’s alphas were used to evaluate internal consistency and values were generally above 0.7; an acceptable minimum for large cohort studies. The report by Cohen et al. (1994) found that alphas for grade 5 students tended to fall below acceptable levels, while 7th grade students appeared able to reliably discriminate these constructs (Australian Institute of Health and Welfare, 2000). The child’s ability to discriminate differences between support and control dimensions has not been closely examined. The three studies that have examined this issue reported weak to moderate associations between these dimensions (Adalbjarnardottir & Hafsteinsson, 2001; Australian Bureau of Statistics, 2004; Bamberg, Findley & Toumbourou, 2006).

Generally, adolescent self-reports were used to measure adolescent behavioural outcomes. Where parent report has also been assessed, relatively small agreement has been found with the child report (Chassin et al., 2005). Dishion et al. (1999) have pioneered combined source measures where reliable higher order factors have been derived by combining indicators from parent, interviewer and child observations. However, the child report tends to be the critical observation used to assess parenting behaviour as the child observation tends to be the most predictive of the development of adolescent behaviours such as self-reported substance use.

The method used to derive parenting style categories from parenting dimensions shows much inconsistency across studies. Adalbjarnardottir and Hafsteinsson (2001) used Lamborn and colleagues (1991) measures and procedures to establish parenting styles. Scale scores for
responsiveness (acceptance/involvement) and demandingness (supervision) were divided into three approximately equal groups and the mid-ranging scorers were dropped from analyses. The findings tended to lack external validity as there were large differences between the initially recruited and the analysed sample. Chassin et al. (2005) used a less controversial median split procedure advocated by Steinberg. This procedure had the advantage of all subjects being retained in the analyses.

In most cases, studies did not use the parenting dimensions to derive parenting style categories (e.g., studies of Barnes, Reifman, Farrell & Dintcheff, 2000; Cohen et al., 1994; Dishion et al., 1999). However, in most cases the unique or independent effect of the parenting dimensions was examined by adding both variables into multi-variate analyses (e.g., Cohen et al., 1994; Kosterman et al., 2000; Webb, Bray, Getz & Adams, 2002). Typically these analyses show that at younger age nurture/support and demandingness (monitoring) make independent contributions to reducing adolescent substance use (e.g., Barnes et al., 2000; Cohen et al., 1994; Kosterman et al., 2000). As adolescence progresses, monitoring is maintained as a direct predictor, while the effect of support reduces to non-significance (e.g., Aquilino & Supple, 2001; Van Der Zwaluw, 2008; Pires & Jenkins, 2007; Engels, Vermulst, Dubas, Bot & Gerris, 2005).

Where developmental pathways have been examined, support tends to work indirectly by contributing to monitoring and by reducing risk factors for substance use, such as relationships with deviant and or substance using peers (Nash, McQueen & Bray, 2005; Kosterman et al., 2000). An obvious analytic step that would evaluate whether Baumrind’s parenting style categories add predictive effects above the parenting domains would be to add an interaction term to analyses. None of the included papers have conducted such an analysis.
4.7 Predictive effects of parenting dimensions and styles

The second aim of the present review was to explore the consistency of predictive findings in the relevant longitudinal studies. In overview research has supported the predictive effects of parenting dimensions but there have been few studies exploring the effect of styles. A behaviour developmental focus has informed the measurement of substance use behaviour in each of the studies. Where substance use has been examined in younger adolescents, the focus has been on the initiation of substance use (e.g., Kosterman et al., 2000; Dishion et al., 1999). In a number of studies, the analytic strategy has predicted incident substance use by eliminating baseline substance users (e.g., Cohen et al., 1994). In middle adolescence, the frequency and severity of substance use has formed the measurement focus (e.g., Steinberg, Fletcher & Darling, 1994; Webb et al., 2002).

Results of reviewed studies in Table 4.2 showed that of the 23 studies that were included in this review, 22 studies found a significant effect between at least one parenting domain and reduced adolescent alcohol and/or drug use. The most consistently measured domain has been parental monitoring (Aquilino & Supple, 2001; Barnes et al., 2000; Cohen et al., 1994; Getz & Bray, 2005; Jackson, Henriksen & Dickinson, 1999; Latendresse et al., 2008; Steinberg, 1994; Webb et al., 2002).

Four of the reviewed studies revealed nurturance, support and monitoring were multivariate predictors of adolescents’ substance use and demonstrated significant direct associations with lower alcohol use and behavioural problems (Adalbjarnardottir & Hafsteinsson, 2001; Chassin et al., 2005; Shucksmith, Glendinning & Hendry, 1997; Van der Zwaluw et al., 2008). In another longitudinal study, Pierce et al. (2002) reported that the combination of high levels of parental support and control contributed to the reduction of
adolescent smoking. Finally, one dimension of parenting was considered in nine other studies. Each of these studies showed a significant predictive impact on adolescent substance use (Barnes et al., 2000; Brody & Ge, 2009; Dishion et al., 1999; Getz & Bray, 2005; Huh, Tristan, Wade & Stice, 2006; Nash et al., 2005; Pires & Jenkins, 2007; Steinberg et al. 1994; Webb et al., 2002).
### Results of reviewed studies

<table>
<thead>
<tr>
<th>Finding (Results)</th>
<th>Study</th>
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<tbody>
<tr>
<td><strong>1. Adalbjarnardottir &amp; Hafsteinsson</strong></td>
<td>Moderate quality evidence. Sample had high attrition. Analyses were adjusted for SES, prior substance use, peer and parent substance use. A number of relationships were found between adolescent (age 14) reports of parenting style and substance use at age 17 which generally supports the view that young people exposed to authoritative parenting have reduced substance use outcomes. For example, authoritative (and in some analyses authoritarian) parenting was correlated with reduced levels of age 14 smoking and alcohol use, and predicted lower rates of progression to age 17 heavy alcohol use, daily smoking, hashish and amphetamine use. The highest risk for substance use was associated with neglectful parenting.</td>
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<tr>
<td><strong>2. Aquilino &amp; Supple</strong></td>
<td>Moderate quality evidence. Variables such as gender, race and parents’ education were controlled for the analyses. Findings indicated parental warmth was not related to substance use in adolescence. In contrast, higher levels of restrictiveness-supervision predicted lower levels of drinking and fewer occasions of binge drinking. On the other hand, parental coercive control was significantly associated with higher levels of cigarette and binge drinking.</td>
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<tr>
<td><strong>3. Barnes et al.</strong></td>
<td>High quality evidence. Analyses were adjusted for parental alcohol abuse, adolescents’ age, race, and gender. Parental monitoring was the only direct predictor of initial alcohol use (intercept, -0.09) and growth (-0.04) in alcohol misuse over time. Parental support was not a direct predictor but indirectly predicted alcohol misuse by predicting parental monitoring. High parental monitoring resulted in low initial levels of adolescent alcohol misuse, and high parental monitoring diminished the upward trajectory (growth) of alcohol misuse throughout the adolescent years. Findings suggested that parental support was related to the increase in alcohol misuse indirectly through monitoring.</td>
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<tr>
<td><strong>4. Brody &amp; Ge</strong></td>
<td>Moderate quality evidence. Analyses were focused on adolescent girls and the sample size was small which may limit the generalisability of this study. Measurement of nurturant-responsive parenting may provide relatively accurate results as both children and observers’ reports were used. Inter-moderating effect was found between child self-regulation and parents’ behavioural responses. The results also show that both nurturant-responsive parenting and harsh-conflict parenting moderated alcohol-use behaviour through influencing adolescent self-regulation.</td>
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<tr>
<td><strong>5. Brody et al.</strong></td>
<td>Moderate quality evidence. This study sampled only the African American population with demographic variables controlled. Results suggested that involved-supportive parenting moderates the effect of genetic vulnerability of substance use. It was also found that the coefficient of the risk conferred by the genetic vulnerability was three times larger in adolescents who received low levels of involved-supportive parenting compared to those who received high levels of involved-supportive parenting.</td>
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<tr>
<td><strong>6. Chassin et al.</strong></td>
<td>Moderate quality evidence. Sub-sample analyses were based on the elimination of baseline smokers and suffered high attrition. Analyses adjusted for age of the child, baseline smoking, parent smoking, parent education and family structure. Adolescent reports of disengaged parenting (low support and control) predicted increased smoking over 2-years. Parent-reports of authoritative compared with disengaged parenting were protective in reducing smoking.</td>
</tr>
<tr>
<td><strong>7. Cohen et al.</strong></td>
<td>Moderate quality evidence. Analyses excluded baseline alcohol and tobacco users and suffered from high attrition. Longitudinal analyses controlled for study condition, ethnicity and gender. In the final wave both monitoring and positive relations generally had protective</td>
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</table>
effects in reducing transitions into 7th to 9th grade for monthly alcohol use (Table 3) and tobacco use (Table 4). Path analysis suggested that positive relations tended to work indirectly by reducing the risk factor of negative peer affiliation, while monitoring had direct effects in reducing tobacco use.

8. Coker & Borders
Low quality evidence. The sample used in this study was not optimally representative, as Asian and Hispanic populations have been oversampled.

By using structural equation modelling, this study suggested that parental support mediated the adolescent problem of drinking by significantly influencing the formation of relationships with peers with positive value. In contrast, parental control has not been supported as having a meaningful indirect influence on adolescent problem-drinking behaviour.

9. Dishion et al.
Moderate quality evidence. Analytic strategy suffered from high attrition by excluding baseline drug users. Sample was small. Analyses adjusted for family context, parental substance use, family management, peer process and boys’ characteristics. Poor discipline significantly predicted higher onset of alcohol, tobacco and marijuana use. Controlling for discipline poor monitoring predicted an increased likelihood of marijuana use.

10. Engels et al.
Low quality evidence. Sample had high attrition with 487 out of 788 dropping out. Attrition analyses were conducted and no difference was found on parental control and affection.

Multiple hierarchical regression has been conducted separately for males and females. For men, low levels of affection expression were significantly influenced by higher levels of problem drinking later in life. In addition, no interactions between variables were found. On the other hand, an interaction effect was found in the female sample for levels of affection expression and strict control. Low levels of affection expression with enhanced levels of strict control were supported as predictive to problem drinking among females. Additionally, no other interaction effects were found.

11. Ennett et al.
High quality evidence. Relatively low response rates. Attrition bias analysis indicated significant differences in ethnicity and family structure between participants who dropped out and those who remained in the study.

While having demographic factors (i.e. age, gender, ethnicity, mother’s education and family structure), parental tobacco and alcohol use, and parent-child communication controlled in analyses, parental monitoring was reported as not significantly predictive of tobacco initiation and later escalation among adolescence. Similarly, both supportive and monitoring types of parenting style were not predictive of initiation or later escalation of alcohol use.

12. Getz & Bray
Moderate quality evidence. By having demographic factors controlled in the analyses, this study indicated that mother’s parental monitoring predicted the heavy use of alcohol in adolescents. A weak-to-moderate effect was suggested for its direct effects as well as its indirect effects mediated by separation. In addition, this study also suggested that being African American was protective against heavy alcohol use.

13. Huh et al.
Moderate quality evidence. Analyses were adjusted for potentially influencing demographic factors including age, maternal and parental education (socioeconomic status).

The results indicated a significant reciprocal effect between parental control and adolescent substance use. Deficits in parental control were shown to be related to future increases in substance use. Adolescent substance use was also shown to predict decreases in perceived parental control. Conversely, a similar effect was not found between parental support and adolescent substance use.

14. Jackson et al.
High quality evidence. Analyses were adjusted for sex, race, single parent status, prior use of alcohol, parental modelling of use. The results show that children were significantly more likely to report alcohol use if two aspects of demandingness were absent. Firstly, if children believed their parents would not know if they were drinking alcohol (no parental monitoring) and secondly, if they perceived low parental demandingness (general standard setting and monitoring). Once other factors were adjusted responsiveness was no longer a
multivariate predictor.

15. Kosterman et al.  
High quality evidence. High response rates and imputation resulted in very low attrition. The results were multivariate adjusted for sex, race/ethnicity, previous marijuana and alcohol initiation, parents’ proactive family management, parents’ alcohol and marijuana use norms, bonding to mother, alcohol and marijuana use norms. Parents’ proactive family management practices decreased the likelihood of marijuana initiation. Parents who had stronger norms against teenage alcohol use, and Asian-American ethnicity reduced the likelihood of alcohol initiation while peer alcohol use increased risks. After controlling for these effects, family management did not maintain predictive effects for age 18 alcohol use.

16. Latendresse et al.  
High quality evidence. After controlling for the effects of zygosity, sex, family structure and prior alcohol use behaviour, this study found that perceived parental monitoring and discipline both significantly mediated the effect of parental alcohol use on adolescent alcohol use. Furthermore, an interaction effect with age was also found. In younger age, parental monitoring were only mediators of adolescent intoxication, while in older age, monitoring and discipline became a partial mediator of adolescent alcohol related behaviours.

17. Nash et al.  
Moderate response rates and attrition with demographic variables unadjusted. This study supported that adolescent alcohol use could at least be partly predicted by parental monitoring and acceptance in both direct and indirect fashion. The structural equation model showed that parental monitoring and acceptance contributed to reduced numbers of alcohol drinking peers and also less perceived approval from peers who use alcohol. Moreover, the model suggested that parental monitoring and acceptance is related to less drinking by facilitated self-efficacy for refusing alcohol. Parenting practices by both parents were indicated as important.

18. Pires & Jenkins  
Low quality evidence. High rate of missing data could pose a threat to the validity of this study. 70% of participants lost at least one value and in most of the cases missing data occurred in the whole case. Variables such as gender, ADHD symptoms, and age were controlled. This study indicated that influences of parental rejection and warmth on substance use are sensitive to age. Parental rejection was supported as significantly predicted drug use at age 10. However as children mature, this relationship diminished so much this association was not evident by age 15. The opposite pattern was found in parental warmth. Interestingly, higher parental warmth predicted a higher level of substance use when children were young. Nonetheless, low in perceived parental warmth was shown to predict a higher level of drug use by mid-adolescence.

19. Shucksmith et al.  
Moderate quality evidence. Findings supported that perceived parental support and control could predict later adolescence drinking behaviour. Adolescents in an older age group who perceived their parents as Authoritative were less likely to drink compared to those who viewed their parents as neglectful or authoritarian. This result could neither be replicated in a younger age group nor while the focus was only on females. Results in males were similar but neglectful parenting does predict more drinking. Furthermore, these effects are still marked even when SES and family structure were controlled for.

20. Steinberg et al.  
Low quality evidence. Analyses were unadjusted for important influencing factors but did control for peer substance use. In unadjusted analyses, high parental monitoring predicted lower longitudinal transitions to substance use. Among boys, higher parental monitoring was no longer a significant predictor of substance use after controlling for peer groups. Among girls, however, parental monitoring predicted lower substance use initiation after controlling for peer group substance use. Monitoring did not predict substance use de-escalation.

21. Stice et al.  
Moderate quality evidence. Analyses were adjusted for adolescent age and parental alcoholism. Gender was unadjusted because no significant predictive value was found in preliminary analyses. Parental support and control were measured with adolescent and maternal reports. Both maternal and adolescent reports suggested that parental support significantly and directly predicted adolescent alcohol use. Conversely, the relationship between parental control and adolescent alcohol use was not supported by adolescent and maternal reports.

22. Van Der Zwaluw et al.  
Low quality evidence. The sample was selected from the Dutch population. While the drinking age in Netherland is 16, its result could be
inconsistency with studies conducted elsewhere. Single parent families were not included, and some related demographic variables (e.g.,
gender, SES) were not adjusted for analyses. Findings indicated that both parental support and control were only predictive to the amount
of alcohol use in younger adolescents (14-y-o or younger). However this relationship was not significant among older adolescents.

23. Webb et al. High quality evidence. Analyses were adjusted for a range of potential influencing factors including gender, age, maternal and paternal
monitoring, alcohol use and externalising behaviour. Perceived maternal monitoring is an important factor for current adolescent alcohol use and as a predictor of lower use over time. Figure
suggests neither maternal nor paternal monitoring were significant prospective predictors after adjusting for other factors, particularly prior
alcohol use and externalising.
4.8 Moderation by culture and ethnicity

The third aim of the current review was to establish whether Baumrind’s parenting domains predict adolescent substance use in cultures outside the United States (US) white context. It’s found that no longitudinal studies have examined whether ethnicity and race moderate the predictive effect of parenting domains. A number of studies have, however, reported different rates of substance use amongst different cultural groups (Barnes et al., 2000; Bronte-Tinkew et al., 2006; Cohen et al., 1994; Getz & Bray, 2005).

Although no longitudinal studies have been undertaken, it has been presumed that different parenting styles are effective in different cultures. For example, an authoritarian style (more monitoring) is more common in Asian cultures than authoritative, and in these cultures is observed to cause less disruptive and delinquent behaviour and less drug and alcohol use in the teenage years (Kosterman et al., 2000; Cohen et al., 1994).

4.9 Family influences model

The fourth aim of this paper was to develop a theoretical model by integrating existing longitudinal findings. In accordance with this aim, a “Family Influences Model” has been developed with specification of relationships between factors that have been suggested as associated with parenting styles and adolescent alcohol use. As shown in Figure 4.2, the relationship between parenting styles and adolescent alcohol use is supported by many studies. At the same time, studies have also suggested the effect of parenting styles on adolescent alcohol use is mediated by different factors. Hence, although the relationship between parenting styles and adolescent alcohol use is widely supported, the nature of it is reasonably complicated.
Figure 4.2. Family Influences Model

As Figure 4.2 shows, the influence of parenting styles especially with regards to the demandingness dimension on adolescent substance use has been examined in seven prior studies. As discussed below, few of these studies have adequately controlled for the possibility that demandingness and nurturance may exert independent effects to the aggregated (interactive) effect of parenting styles.
A reciprocal relationship between adolescent alcohol use and parenting styles was also recognised in several of the studies. One study suggested it is because the child’s self-regulation is affected that reciprocal mediating effects emerge. Parenting styles were also suggested as influential in mediating peer influence and selection of peer groups, which may affect a child’s decision to use substances. Additionally, one study suggested the relationship between peers and individual substance use is not in one direction, but in both directions acting reciprocally. Family characteristics and a child’s demographic characteristics, such as gender, age and genetic vulnerability have also been indicated as influences on adolescent substance use behaviour by a number of studies. Last but not least, parental substance use might also be an important factor.

4.10 Discussion

This paper presents the first systematic review of longitudinal behavioural studies that have investigated the relationship between the critical dimensions of parenting behaviour referenced in Baumrind’s theory and adolescent substance use. A total of 23 studies met the inclusion criteria.

The first aim of the present study was to evaluate whether the domains of nurturance and demandingness and parenting styles have been reliably and validly measured. In contradiction of the first hypothesis we found parenting styles had not been reliably measured in the available literature published since Baumrind’s study. Inter-item consistency was the major means of establishing scale reliability in the included studies. Reliabilities for child report of parenting dimensions were generally satisfactory in older adolescent populations, but less reliable in younger children (Cohen et al., 1994). The findings suggest important gaps in the available literature. None of the included studies used structural equation modelling or latent class
modelling to assess the measurement ‘fit’ of the parenting domains. Although Baumrind (1991) demonstrated that parenting styles predicted substance use, a central empirical question not investigated in Baumrind’s study was whether the parenting style categories offered a predictive advantage after controlling for the parenting dimensions that the categories were derived from. This central question has not been investigated in any of the subsequent longitudinal studies included in this present review.

The second aim of the present study was to investigate whether Baumrind’s finding of a longitudinal predictive effect for parenting style dimensions on adolescent substance use has been replicated in subsequent studies. In support of the hypotheses the findings provide clear confirmation of Baumrind’s findings for parenting dimensions, but there has been a lack of research examining styles. Of the included studies, 22 revealed significant prospective predictions between one or both of Baumrind’s parenting behaviour domains along with reduced levels of adolescent substance use. The most consistent predictive effect has been that monitoring reduces adolescent substance use with 18 studies confirming this effect. There is evidence from Steinberg et al. (1994) that once adolescents have initiated substance use, the parenting domains show less direct potential to encourage de-escalation or cessation of substance use. In line with this, Huh et al. (2006) indicated that greater adolescent substance use was associated with decreases in perceived parental control. While evidence also supported that a low level of perceived parental control predicted increases in adolescent female substance use, a reciprocal relationship between adolescent substance use and parenting styles was suggested.

The available studies reviewed in the present paper have advanced theoretical insight beyond Baumrind’s initial distinctions. At younger ages both nurture/support and demandingness (monitoring) appear to make independent contributions to reducing adolescent substance use.
Monitoring is maintained as a direct predictor as adolescence progresses, while the effect of support reduces to non-significance (Cohen et al., 1994). Where developmental pathways have been examined, support tends to work indirectly by contributing to monitoring (Barnes et al., 2000). In addition, Brody and Ge (2001) found that both nurturant-responsive and harsh-conflicted parenting was only indirectly associated with adolescent alcohol use through adolescent self-regulation. Furthermore, influence of parenting styles on adolescent self-regulation were suggested as contemporary, whereas adolescent self-regulation predicted later parenting.

These insights suggest there may be a temporal ordering so children perceive parental relationships as supportive at the start of adolescence in order for the adolescent to communicate the information that parents require in order to monitor the adolescent. Where parental demandingness is implemented with overly harsh discipline, both adolescent perceptions of support and monitoring may suffer. Although there is detail added to the temporal ordering and relationship between the major dimensions, Baumrind’s typology appears to have accurately captured two important domains that influence adolescent socialisation into substance use. More recent studies have sought to examine whether there are additional domains that may also be influential. In the study by Dishion et al. (1999), parental direct communication relevant to substance use was not found to add any predictive advantage above that of monitoring.

From a developmental perspective, consistent with the proposition of theorists, parenting style is supported as influential to later development in adolescence by the studies in this review. During the adolescent transition, many adolescents engage in unhealthy and self-destructive behaviour. However, results from reviewed studies showed that coercive parental interventions that targeted adolescents are likely to backfire possibly because adolescents are in a stage of
seeking independence as theorised by Erikson (1963) and Havighurst (1975). Baumrind (1985) suggested that during adolescence, the parent-child relationship is transformed from a parent-dominant relationship to a more reciprocal relationship. In line with this, the most common finding among the adolescent substance abuse literature is that a demanding but supportive family environment is more likely to keep adolescents from early exposure to substances. However, the implications of this finding for preventive intervention are far from clear.

One set of domains that emerge consistently and somewhat independently of socialisation domains are parental behaviours and attitudes. The “Social Development Model” (SDM) (Catalano & Hawkins, 1996) presents an integrated developmental theory positing opportunities, rewards and skills as critical proximal influences on the development of adolescent attitudes and behaviours. This model anticipates these influences and also accurately predicts the finding that early adolescent parenting can influence the child’s orientation to the peer group (Catalano & Hawkins, 1996). This may be one mechanism by which parenting factors influence peer risk factors for adolescent substance use in this critical stage. Nurturing parental behaviour possibly allows the adolescent to develop competence and work through the formation of personal attitudes essential to identity formation. Nurturance may model good habits of communication and relationship skills. Demandingness on the other hand, may also be influential. Realistic demands might influence habits of work (Havighurst, 1975), and establish realistic ego boundaries (see Erikson’s identity and generativity stages) (Erikson, 1963). Realistic expectations and demands may also provide consequential learning opportunities. However, empirical evidence, particularly longitudinal evidence for this link is limited. Additionally, there has been a lack of research examining the mechanism by which parenting domains influence adolescent substance use.
A third goal of the present study was to establish whether the Baumrind parenting dimensions were predictive of adolescent substance use in cultures outside the white US context. In overview, the existing research within the 23 included studies provides little information with which to evaluate the study hypotheses.

There is, however, consistent evidence that rates of adolescent alcohol and drug use vary by country of birth and cultural identification. A large cross-national study (Hibell et al., 2007) has demonstrated considerable country variation across Europe and the US in adolescent substance use. In a study within the US, Bronte-Tinkew et al. (2006) reported that being African-American, Indian or Asian compared with being non-Hispanic or White, significantly decreased the risk of adolescents initiating substance use. Barnes et al. (2000) reported that black adolescents were less likely to initiate alcohol use and had lower increases in alcohol use compared to their white counterparts during adolescence. Cohen et al. (1994) showed that disruptive behaviour and friends’ drug use were at their lowest levels in Asian adolescents. It is unclear to what extent this variation can be attributed to differences in parenting style.

With regards to the forth aim, the present study integrated existing longitudinal findings into a theoretical model after a systematic review of the existing studies. The following diagram presents a “Family Influences Model” integrating different family factors within the demandingness and nurturance/responsiveness domains that have been documented in this current review as affecting the development of adolescent substance use from childhood, through puberty and into adolescence.
4.11 Limitations

The current review was limited by a relatively small number of included studies, the failure of extant studies to analyse key questions, sub-sample analyses undermining external validity and the predominance of US research.

There is a critical lack of Australian and other international studies on the patterns of substance use, and the role of parenting. There appear to be important differences, particularly relating to cultural norms and attitudes, which may reduce the generalizing of the results of US research to other contexts. A greater investment in research in this area is warranted.

Finally, the main limitation was that all reviewed studies measured parenting dimensions in inconsistent ways and in a number of cases did not include both of the Baumrind dimensions. For example, some of the studies just looked at monitoring and control while others considered nurturance or support. All studies failed to examine whether parenting style categories contributed predictive effects above those achieved using the discreet parenting dimensions. Furthermore, although there is a number of studies measure parenting styles by using Baumrind’s parenting dimensions, there are very few studies that have attempted to directly confirm the validity of the parenting categories put forward by Baumrind. Using techniques such as “Latent Class Analysis” (LCA) to explore the parenting categories proposed by Baumrind will be beneficial in providing a supportive base for existing literature and further intervention programs.

As alcohol and drug use is predicted to remain a common adolescent problem, there is an important need for research to clarify modifiable domains that can be targeted in intervention and prevention strategies. The available longitudinal research supports the parenting dimensions
identified by Baumrind. Additional research is recommended to establish whether parenting style categories contribute predictive effects above those achieved using the discreet parenting dimensions. The available research has not explored more detailed issues related to variation within families. For example, there has been a lack of studies exploring whether parents in the same family adopt different parenting styles in relation to their different children. Additionally, there is also a need to study whether different parents in the same family adopt different styles, and if so, whether this alters the impact on child adjustment.

More importantly, there is a need to more comprehensively measure parenting dimensions in future studies examining the effects on adolescent substance use and to extend studies beyond the current focus on white US samples.

4.12 Conclusion

Within the limitations of the small number of included studies, the current review reveals consistent evidence that Baumrind’s parenting styles or the parental behaviours that underlie these dimensions can be reliably assessed to provide longitudinally prediction of the emergence of adolescent substance use. One practical implication that follows from this finding is the potential to use adolescent reports of parenting as a tool to monitor the effectiveness of parenting for individual adolescents and for communities located within schools and neighbourhoods. The existing research presents a range of valid measures that can be used to monitor child reports of parental nurturance and monitoring/control. Using such measures to monitor investment in parent education appears a useful strategy for supplementing existing public health surveillance (Glaser, Van Horn, Arthur, Hawkins & Catalano, 2005). A Family Influences Model is proposed as a method of integrating findings from the available longitudinal research.
Although prior research shows that parenting behaviours predict the development of adolescent substance use, an important question that requires further investigation is whether Baumrind’s parenting style dimensions have independent predictive effects relative to the parental behaviours that underlie these dimensions. Further research is also required to improve understanding of the effects of parenting behaviour in countries outside of the United States and in different cultural contexts. The three chapters that follow present empirical investigations exploring these issues.
Chapter Five – The Influence of Parenting Style on Adolescent Alcohol Use

This chapter has already submitted to the Journal of studies on alcohol and drugs.

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Conception, writing and compiling of manuscript, established methodology, completed literature search and appraisal, data analyses, preparation of tables.

I declare that the above is an accurate description of my contribution to this paper, and the contributions of other authors are as described below.

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Abstract

Adolescent alcohol use is a serious problem in Australia and other nations. Longitudinal data on family predictors is valuable to guide parent education efforts. The present study tested Baumrind’s proposal that parenting styles are direct predictors of adolescent alcohol use. Latent class modelling was used to investigate adolescent perceptions of parenting styles and multivariate regression to examine their predictive effect on the development of adolescent alcohol use. The data set comprised 2,081 secondary school students from metropolitan Melbourne, Australia, who completed three waves of annual longitudinal data starting in 2004. Baumrind’s parenting styles were significant predictors in unadjusted analyses but these effects were not maintained in multivariate models that also included parenting behaviour dimensions. Family influences on the development of adolescent alcohol use appear to operate more directly through specific family management behaviours rather than through more global parenting styles.

Keywords: Adolescent alcohol use, Longitudinal Research, Risk Factors, Parenting Styles, Parenting behaviour, Family management, Family attachment
Chapter Five: Parenting Style and Alcohol Use (Empirical Study One)

5.1 Introduction

Alcohol is an important contributor to preventable harm in young adults (Toumbourou et al., 2007). A common finding that young adult alcohol use is predicted by the level of alcohol use in adolescence and the age of first use (Toumbourou et al., 2004; Pitkänen, Lyyra & Pulkkinen, 2005) has led to global efforts to delay the age of first alcohol use (DeWit, Adlaf, Offord & Ogborne, 2000; National Health and Medical Research Council, 2009).

Several factors have been shown to put adolescents at risk of both early initiation and harmful alcohol use. Large longitudinal studies of adolescent alcohol use show that predictors exist in a range of areas including genetics, peer and individual characteristics, and within the school and family (Donovan, 2004; Hawkins et al., 1992; Ryan et al., 2010). Furthermore, theories of alcohol use motivations suggest that availability and access to alcohol, together with social and physical reinforcers are key factors influencing adolescent alcohol use (Toumbourou et al., 2007).

Several studies have specifically investigated the influence of parents and families on adolescent alcohol use (Bahr & Hoffmann, 2010; Clausen, 1996). A number of parental behaviours influence adolescent substance use, for instance, the risk of adolescent alcohol and drug use increases with parental provision of alcohol (Shortt, Hutchinson, Delyse, Chapman & Toumbourou, 2007), inconsistent parental feedback and unreasonably severe punishment (Brook, Brook, Gordon, Whiteman & Cohen, 1990). The risk also rises when adolescents perceive a lack of closeness, warmth and involvement with parents (Ryan et al., 2010).

In large longitudinal studies that have examined the impact of parental demanding (e.g., control efforts, setting and monitoring rules) and nurturing (e.g., affection, support) behaviours
on adolescent substance use. Overall, 19 of the 23 reviewed studies (based on quality criteria such as large samples and low attrition) reported that parenting behaviours predicted adolescent alcohol use, either directly or indirectly. A common finding has been that both parental nurturance and/or demandingness contribute independently and directly to predicting adolescent alcohol use (e.g., Cohen et al., 2001; Latendresse et al., 2008; Nash et al., 2005; Stice, Barrera & Chassin, 1998; Van Der Zwaluw et al., 2008; Aquilino & Supple, 2001; Barnes et al., 2000; Coker & Borders, 2001; Jackson et al., 1999; Getz & Bray, 2005; Huh et al., 2006; Steinberg & Sheffield, 2001; Pires & Jenkins, 2006; Webb et al., 2002). Four studies suggest that parental nurturance and/or parental demandingness affect adolescent alcohol use indirectly by mediating factors such as parental monitoring, self-regulation, genetic vulnerability and peers (Barnes et al., 2000; Brody & Ge, 2001; Brody et al., 2009; Coker & Borders, 2001).

A number of discrepancies can be found between the findings of the reviewed longitudinal studies examining the effect of parenting behaviours on adolescent alcohol use. Some studies found a significant effect of parental monitoring, but a non-significant effect of parental warmth in predicting adolescent alcohol use (Aquilino & Supple, 2001; Barnes et al., 2000; Huh et al., 2006; Jackson et al., 1999). A smaller number of studies found parental warmth but not parental monitoring to be predictive (Coker & Borders, 2001; Stice et al., 1998) or that neither of these two parenting dimensions predicted adolescent alcohol use (Engels et al., 2005; Ennett et al. 2001; Kosterman et al., 2000). These discrepancies between studies may be explained by the different factors controlled in the studies. Factors that have been shown to predict adolescent alcohol use (Hemphill et al., 2011) that were inconsistently controlled across studies included initial rates of alcohol and drug use, antisocial behaviour, and school failure and
family context. Given that the evidence is equivocal across studies, it is important to base future analyses on theoretical models.

According to the “Social Development Model” (SDM) (Catalano & Hawkins, 1996), children learn patterns of behaviour from daily social interaction within different social contexts. The SDM suggests that the adoption of behaviours in a social context is influenced by social bonding (attachment). Once an individual bonds to a social context they are more likely to behave according to the norms, behaviours and beliefs in that context, regardless of whether the behaviour is health promoting or health compromising (Catalano & Hawkins, 1996).

Within the broad field of family influence, Baumrind (1991) has made a classic theoretical contribution in suggesting that parenting that balancing both nurturing (e.g., communication, support) and demanding behaviours (e.g., setting and enforcing child behaviour expectations) is more likely to be effective in preventing adolescent problems such as alcohol use. Baumrind’s theory describing the balance of parent behaviours overlaps with more recent integrative theories (Catalano & Hawkins, 1996) in emphasising the combined influence of both bonding (nurturance) and parental control practices (demands). Baumrind argued that these two parenting dimensions define “parenting styles” that are important influences for adolescent alcohol use. Baumrind argued further that the two key dimensions of parenting behaviour did not simply act independently, but acted interactively to form defined “parenting styles”.

Through the combination of the two key parent behaviour dimensions, Baumrind defined four parenting styles, constituting different levels of nurturance and demandingness (Adalbjarnardottir & Hafsteinsson, 2001). “Authoritative” parents are those who show both nurturance (responsiveness, high bonding) and demandingness in interaction. “Authoritarian” parents are demanding and controlling, but not responsive or warm. “Permissive” parents are
nurturing/responsive but indulge their children by lacking demands for behavioural control. “Neglectful-Rejectful” parents are neither responsive nor demanding.

Longitudinal studies show that children who were raised by authoritative parents tend to display higher levels of behavioural, emotional, and psychological adjustment (Stephenson, Quick & Hirsch, 2010). However, with respect to alcohol use, there has been limited research with only four longitudinal studies that have examined groups defined based on Baumrind’s parenting style typologies. In small longitudinal studies (Baumrind, 1991; Lamborn et al., 1991), authoritative parenting style has been found to be protective in discouraging adolescent alcohol use. In two larger studies, neglectful parenting predicted higher rates of adolescent alcohol use (Adalbjarnardottir & Hafsteinsson, 2001; Shucksmith et al., 1997). The consistency of findings across these studies investigating parenting styles can be contrasted with the equivocal results of longitudinal studies (described above) that have examined one or two parenting behaviours independently or concurrently.

Although some prior studies have investigated aspects of Baumrind’s parenting style predictions for adolescent alcohol use, the above summary suggests a number of gaps in the research to date. Firstly, there have been limited studies which have used person-centred approach to examine whether parenting behaviours and styles are empirically valid constructs and whether these constructs are significant in predicting adolescent alcohol use. Previous studies examining family socialisation and alcohol consumption focused on one or two major domains of parenting (support or control); and the combined influence of support and control is less researched but maybe more directly predictive of the likelihood of adolescent alcohol use (Adalbjarnardottir & Hafsteinsson, 2001). Secondly, most of the research modelled parenting styles rather than behaviours is cross-sectional (e.g., Bahr & Hoffmann, 2010). Finally there has
been little research outside of the North American context. Consequently, whether parenting styles can be measured and categorised as Baumrind proposed in countries such as Australia is yet to be explored.

Hence, the aims of the present study were to test whether Baumrind’s proposed parenting styles could be validly identified from Australian adolescent reports of parenting behaviours using “Latent Class Analysis” (LCA); and to explore the longitudinal prediction of the development of adolescent alcohol use comparing adolescent reports of both specific parenting behaviours and broader parenting styles. It was hypothesised that: (1) four parenting styles would be identified that are comparable to the typologies proposed by Baumrind; and (2) authoritative styles would be predictive of lower levels of alcohol use relative to authoritarian, indulgent or neglectful styles, after specific parenting behaviours and other factors were controlled in multivariate analytic models.

5.2 Methods

The “Resilient Families Research Initiative” (RFRI) is a prospective cluster randomised controlled trial evaluating the effectiveness of the resilient families program (Australian Clinical Trial Registry Number: 012606000399594). The resilient families program is an early secondary school intervention program (from Years 7 through to 9) designed to develop family support networks and reduce early adolescent experience of health and social problems. The RFRI comprised: (1) a school-based student curriculum designed to promote adolescent resilience and healthy family relationships; (2) parent education evenings delivered using the “Parenting Adolescents Quiz” (PAQ) and designed to assist parents in promoting healthy adolescent development (Toumbourou, Gregg, Davies & Carr-Gregg, 1999); (3) sequenced
parent education groups delivered over eight-weeks using the “Parenting Adolescents: A Creative Experience” (PACE) program (Jenkin & Bretherton, 1994), and; (4) a handbook for parents and carers designed to further assist parents in supporting their adolescent child (Jenkin & Toumbourou, 2005). Shortt and colleagues have detailed the RFRI components (Shortt, Toumbourou & Chapman, 2006; Shortt, Toumbourou, Chapman & Power, 2006).

5.2.1 Measures

The questionnaires covered a range of factors including items relevant to individual behaviours and attitudes and social development influences in community, family, peer and school domains. A more detailed account of the measures can be found in Shortt et al. (2007). In what follows specific details are provided relevant to the items and scales used in the present analyses. Unless stated otherwise the scales used in the present analyses were all sourced from the “Community that Care” (CTC) youth survey (Arthur, Hawkins, Pollard, Catalano & Baglioni, 2002; Glaser et al., 2005) and scale scores consisted of the average across the included items.

5.2.1.1 Parenting style groups

Seventeen items were selected to represent the two key parenting dimensions in which Baumrind’s parenting styles were based on (i.e., parental demandingness and nurturance). Parental demandingness was assessed by the CTC low family management scale, which is a well-validated measure incorporating items relevant to family rules and monitoring. The scale consisted of the following six items: “Would your parents know if you did not come home on time”; “The rules in my family are clear”; “My family has clear rules about alcohol and drug use”; “My parents ask if I’ve finished my homework”; “When I am not home, one of my parents
knows where I am and who I am with”; “My parents want me to call if I’m going to be late home” (Cronbach’s Alpha = 0.72). Responses options were 1 “YES!”, 2 “yes”, 3 “no”, 4 “NO!”.

Parental nurturance was measured using 11 items from four CTC scales. Family opportunities scale consisted of the following three items: “If I had a personal problem, I could ask my mum or dad for help”; “My parents give me lots of chances to do fun things with them”; and “My parents ask me what I think before most family decisions affecting me are made” (Alpha=0.75). Attachment to mother scale was measured by three items: “Do you feel very close to your mother”; “Do you share your thoughts and feelings with your mother”; “Do you enjoy spending time with your mother” (Alpha=0.78). Attachment to father scale was based on the same three items of Attachment to Mother with the referent changed to “Father” (Alpha=0.83, responses were coded such that higher scores reflect attachment). Responses for the above items were recorded using the response options for low family management, recoded such that high scores reflected parental nurture. Family rewards consisted of two items: “My parents notice when I am doing a good job and let me know about it” and “How often do your parents tell you they’re proud of you for something you’ve done” (Alpha=0.67). Response options ranged from 1 “Never or almost never”, 2 “Sometimes”, 3 “Often”, 4 “All the time”.

5.2.1.2 Alcohol use

Alcohol use was measured at both Wave 1 and 3 by asking respondents whether they had ever had more than just a sip or two of an alcoholic beverage (like beer, wine or liquor/spirits). Responses were categorised into two groups: alcohol users (lifetime) and non-users.
5.2.1.3 Wave 1 variables

Antisocial behaviour was assessed based on nine items; four items from the CTC survey on past anti-social behaviours asking respondents whether they had: Stolen something; physically attacked someone; carried a weapon; and been arrested. Response options ranged from 0 “Never” to 2 “Yes, in the last year”. Another five items were selected from the “Strengths and Difficulties Questionnaire” (SDQ) (Goodman, 2001): “I get very angry and often lose my temper”; “I usually do as I am told” (reverse-scored); “I fight with others”; “I am accused of lying or cheating”; and “I take things that are not mine” (Alpha 9-items=0.73). Response options ranged from 0 “Never” to 2 “Certainly True”. Academic failure was assessed by one item: “Putting them all together, what were your marks like last year?”. Response options ranged from 1 “Very Good” to 5 “Very Poor”. Demographics factors were assessed based on student responses to questions on female gender, whether country of birth was outside Australia, and whether parental marital status was separated/divorced or other. Cigarette use was measured by asking respondents whether they had ever smoked cigarettes. Cannabis use was measured by asking respondents whether they had ever used marijuana. Responses for cigarette and cannabis use were categorised into two groups: users (lifetime) and non-users.

5.2.2 Participants and procedure

The study procedures are reported in Toumbourou et al. (2013) and summarised in what follows. Prior to the baseline survey, fifty-six schools were identified within the initial sample frame for participation in the RFRI. These schools were part of a separate study of the development of adolescent behaviour (McMorris, Hemphill, Toumbourou, Catalano & Patton, 2007), and had previously been randomly selected using a probability proportionate to grade-level size procedure (Kish, 1965). Thirty-nine schools from metropolitan Melbourne were
randomly selected to participate in the RFRI, stratified based on education sector (government or independent), and socio-economic status (proportion of families assisted for low income).

Twenty-four schools agreed to participate (62% participation rate). Prior to being approached, twelve schools were randomised to intervention and conducted the resilient families program over 2004-2005 and the remaining twelve schools were randomly assigned to be approached as usual practice controls. For the current study, the total eligible survey population across the 24 schools consisted of students in the first year of secondary school in 2004 (Year 7; mean age=12.3 years, SD=.50, n=4,404). Only eligible students whose parents returned signed consent forms were approached at the baseline survey (n=2,356, 53% of the eligible sample). Students provided their consent to participate on the day of the survey. Adolescents were resurveyed after 2-years (Year 9; mean age=14.5 years, SD=.50). The present analysis was based on 2,081 students from Metropolitan Melbourne (47% of the eligible sample, 88% of the consenting sample; who were studying in Year 7 at baseline) whose parents provided signed consent and who responded to all relevant items at the two surveys. Of the sample included in this analysis: 55.9% were female; 9.4% were born outside Australia; and 20.9% had parents who were either separated or divorced.

Adolescents responded to paper questionnaires during a standard classroom period under the supervision of research staff. Students that were no longer in their original schools were followed-up and surveyed in their new school locations.
5.3 Analysis plan

“Latent Class Analysis” (LCA), being a person-centred method, was used to identify parenting style groups from the 17 items assessing parental demandingness (using items assessing low family management) and nurturance (using items assessing: family opportunities; attachment to mother; and father; and family rewards). These items were entered into the LCA analysis as dichotomous measures with 2 reflecting agreement (e.g., collapsing “YES” “yes” on family management) and 1 disagreement. LCA sought to identify whether item responses shared associations through a small number of discrete latent classes. Models were compared with different numbers of classes with model selection based on: (1) decreasing values in model fit statistics such as the “Akaike Information Criterion” (AIC) and “Bayesian Information Criterion” (BIC); and (2) the reliability of the model convergence across 1,000 trials. Using the posterior probabilities of class membership generated by the final latent class model, participants were assigned into the most likely parenting style group. The average responses of the five CTC family scales were then calculated for each parenting style group and were used to validate and assist with labelling of the parenting style latent classes.

Logistic regression analyses were performed to predict alcohol use at Wave 3. Alcohol use at Wave 3 was found to be significantly associated with the classroom clustering of respondents at the Wave 1 survey (intra class correlation=0.03), hence all analyses were adjusted for classroom clustering. Regression models sought to identify predictors that increased alcohol use from Wave 1 to Wave 3, hence all models controlled for Wave 1 alcohol use. The logistic regression analyses were presented in two models. In the partially adjusted models, analyses were run separately for each predictor controlling only for Wave 1 alcohol use and not adjusting for other factors. The parenting style groups were entered into these regression models as a
single variable with four categories representing the four parenting styles. In the fully adjusted model, multivariate analyses controlled for all predictors. Preparation of items and variables and logistic regression models were completed using STATA version 12 (StataCorp, 2011); all LCA models were fit using SAS® version 9.2 for Windows1 (Lanza et al., 2010).

5.4 Results

5.4.1 Latent classes of parenting styles

A series of LCA models with one to six classes were run and compared to determine the optimal number of latent classes that best fit the data. The AIC and BIC suggested that the five-latent-class model was slightly superior. However, the four-latent-class model (AIC= 3767.06; BIC= 4167.54) was selected based on its reliable convergence (100% convergence to the same solution across 1,000 trials) while the five-latent-class model (AIC= 3645.27; BIC= 4147.29) was unreliable (35% convergence) and less interpretable. Table 5.1 shows the solution of the final four-latent-class model with prevalence item-response probabilities for each latent class. Class 2 contains the majority of the sample (55.1%) which show high probabilities of reporting agreement to all indicators. The second most common latent class was Class 3 (24.9% of sample) which showed low probabilities of endorsing the items asking whether participants shared their thoughts and feelings with their mother or father. Class 1 contained 11.5% of the sample which was characterised by low probabilities of endorsing items from the attachment to father scale. The least prevalent latent class was Class 4 which was characterised by low probabilities of endorsing items from the attachment to father scale.
probabilities of sharing thoughts and feeling with both parents, feeling close to father, and having opportunities in the family.

Table 5.1

*Prevalences and item-response probabilities for each latent class of the final four-latent-class model*

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Latent Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>My parents notice when I am doing a good job and let me know about it</td>
<td>0.9798</td>
</tr>
<tr>
<td>Your parents tell you they’re proud of you for something you’ve done</td>
<td>0.9627</td>
</tr>
<tr>
<td>Feel very close to your mother</td>
<td>0.9818</td>
</tr>
<tr>
<td>Share your thoughts and feelings with your mother</td>
<td>0.8360</td>
</tr>
<tr>
<td>Enjoy spending time with your mother</td>
<td>0.9122</td>
</tr>
<tr>
<td>Feel very close to your father</td>
<td>0.2577</td>
</tr>
<tr>
<td>Share your thoughts and feelings with your father</td>
<td>0.1348</td>
</tr>
<tr>
<td>Enjoy spending time with your father</td>
<td>0.3812</td>
</tr>
<tr>
<td>If I had a personal problem, I could ask my mum or dad for help</td>
<td>0.8457</td>
</tr>
<tr>
<td>My parents give me lots of chances to do fun things with them</td>
<td>0.8766</td>
</tr>
<tr>
<td>My parents ask me what I think before most family decisions affecting me are made</td>
<td>0.7394</td>
</tr>
<tr>
<td>Your parents know if you did not come home on time</td>
<td>0.8943</td>
</tr>
<tr>
<td>Rules in my family are clear</td>
<td>0.8306</td>
</tr>
<tr>
<td>Clear rules about alcohol and drug use in my family</td>
<td>0.8607</td>
</tr>
<tr>
<td>My parents ask if I’ve finished my homework</td>
<td>0.9015</td>
</tr>
<tr>
<td>When I am not home, one of my parents knows where I am and who I am with</td>
<td>0.9382</td>
</tr>
<tr>
<td>My parents want me to call if I’m going to be late home</td>
<td>0.9481</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prevalences</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.5%</td>
</tr>
<tr>
<td>55.1%</td>
</tr>
<tr>
<td>24.6%</td>
</tr>
<tr>
<td>8.8%</td>
</tr>
</tbody>
</table>
Table 5.2

Descriptive statistics for the five Communities That Care (CTC) family scales at Wave 1 and percentage reporting alcohol use in Wave 1 and 3 of each latent class group

<table>
<thead>
<tr>
<th>Interpretation (size)</th>
<th>1 (Authoritarian n=227)</th>
<th>2 (Authoritative n=1186)</th>
<th>3 (Permissive n=489)</th>
<th>4 (Neglectful n=179)</th>
<th>Combined sample (N=2081)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wave 1 CTC family scales</strong></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Family Rewards</td>
<td>2.96</td>
<td>0.78</td>
<td>3.42</td>
<td>0.63</td>
<td>2.98</td>
</tr>
<tr>
<td>Mother Attachment</td>
<td>3.45</td>
<td>0.50</td>
<td>3.74</td>
<td>0.32</td>
<td>3.02</td>
</tr>
<tr>
<td>Father Attachment</td>
<td>1.91</td>
<td>0.60</td>
<td>3.60</td>
<td>0.41</td>
<td>3.06</td>
</tr>
<tr>
<td>Family Opportunities</td>
<td>3.16</td>
<td>0.55</td>
<td>3.59</td>
<td>0.41</td>
<td>2.91</td>
</tr>
<tr>
<td>Poor Family Management</td>
<td>1.51</td>
<td>0.42</td>
<td>1.30</td>
<td>0.32</td>
<td>1.61</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alcohol use</th>
<th>Proportion (%)</th>
<th>95% CI</th>
<th>Proportion (%)</th>
<th>95% CI</th>
<th>Proportion (%)</th>
<th>95% CI</th>
<th>Proportion (%)</th>
<th>95% CI</th>
<th>Proportion (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wave 1 Alcohol use</td>
<td>34</td>
<td>27 - 41</td>
<td>27</td>
<td>24 - 30</td>
<td>40</td>
<td>35 - 45</td>
<td>51</td>
<td>44 - 59</td>
<td>33</td>
<td>30 - 35</td>
</tr>
<tr>
<td>Wave 3 Alcohol use</td>
<td>73</td>
<td>68 - 78</td>
<td>69</td>
<td>66 - 72</td>
<td>77</td>
<td>73 - 81</td>
<td>82</td>
<td>76 - 88</td>
<td>72</td>
<td>70 - 75</td>
</tr>
</tbody>
</table>
Average responses to the five CTC family scales and percentages reporting alcohol use at Wave 1 and 3 broken down by the final four-latent-class model groups are presented in Table 5.2. Item means were interpreted to be low or high within a latent class where they differed by more than half a standard deviation from the combined sample mean. Class 1 was interpreted as authoritarian (father): respondents reported average mother attachment but low father attachment and average family management (high scores reflect problems). Class 2 as authoritative: the family management problems and scores on the parental attachment and opportunities scales reported by respondents were above average. Class 3 permissive (father): respondents reported average father attachment, family rewards and family management problems, average family opportunities and low mother attachment. Class 4 as neglectful: this group reported high family management problems and low scores on the parental nurturance scales.

5.4.2 Regression analyses predicting alcohol use

Table 5.3 presents the logistic regression findings predicting Wave 3 (W3) alcohol use from parenting style and other factors at Wave 1 (W1). Table 5.3 (Model 1) presented the partially adjusted logistic regression model predicting the prevalence of current alcohol use at W3 (n=2,081) from the parenting style groups, adjusting for W1 alcohol use, but without adjusting for other predictors. In this case, those adolescent whose parents were classified into the authoritative parenting style group were at less risk of alcohol use in W3, relative to those whose parents were neglectful. The partially-adjusted model showed a range of factors that were associated with Wave 3 alcohol use.

The multivariate fully-adjusted logistic regression model predicting current alcohol use (W3) is presented in Table 5.3 (fully adjusted model). The result showed no significant relationship between alcohol use and the four parental nurturance scales; however, poor family management was
a significant risk factor. The parenting style groups were not significant, after adjusting for other effects. The results revealed that having experienced alcohol use in W1 increased the likelihood of using it in W3.

Table 5.3

*Logistic regression predicting Wave 3 alcohol use from variables measured in Wave 1*

<table>
<thead>
<tr>
<th>Wave 1 Predictors</th>
<th>Partially Adjusted Model&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Fully Adjusted Model&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds ratios 95% CI</td>
<td>Odds ratios 95% CI</td>
</tr>
<tr>
<td>Parenting Style (referent: Authoritative)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authoritarian</td>
<td>1.13 0.84, 1.51</td>
<td>0.73 0.45, 1.21</td>
</tr>
<tr>
<td>Permissive</td>
<td>1.29 0.99, 1.68</td>
<td>1.02 0.72, 1.44</td>
</tr>
<tr>
<td>Neglectful</td>
<td><strong>1.56</strong> 1.04, 2.35</td>
<td>0.86 0.44, 1.69</td>
</tr>
<tr>
<td>Family Rewards</td>
<td>0.90 0.80, 1.02</td>
<td>1.04 0.88, 1.23</td>
</tr>
<tr>
<td>Mother Attachment</td>
<td>0.85 0.71, 1.02</td>
<td>1.11 0.84, 1.48</td>
</tr>
<tr>
<td>Father Attachment</td>
<td><strong>0.84</strong> 0.74, 0.96</td>
<td>0.87 0.67, 1.12</td>
</tr>
<tr>
<td>Family Opportunities</td>
<td><strong>0.82</strong> 0.71, 0.95</td>
<td>1.00 0.80, 1.26</td>
</tr>
<tr>
<td>Poor Family Management</td>
<td><strong>1.80</strong> 1.40, 2.33</td>
<td><strong>1.56</strong> 1.16, 2.10</td>
</tr>
<tr>
<td>Female</td>
<td>1.08 0.88, 1.32</td>
<td>1.19 0.96, 1.47</td>
</tr>
<tr>
<td>Non-Australian Birth</td>
<td><strong>0.56</strong> 0.41, 0.78</td>
<td><strong>0.57</strong> 0.41, 0.79</td>
</tr>
<tr>
<td>Parents Separated / Divorced</td>
<td><strong>1.33</strong> 1.01, 1.73</td>
<td>1.18 0.88, 1.57</td>
</tr>
<tr>
<td>Alcohol Use</td>
<td><strong>4.46</strong> 3.42, 5.83</td>
<td><strong>3.19</strong> 2.38, 4.29</td>
</tr>
<tr>
<td>Cannabis Use</td>
<td>2.14 0.27, 17.16</td>
<td>0.99 0.16, 6.04</td>
</tr>
<tr>
<td>Cigarette Use</td>
<td><strong>1.96</strong> 1.06, 3.64</td>
<td>1.39 0.72, 2.69</td>
</tr>
<tr>
<td>Academic Failure</td>
<td><strong>1.20</strong> 1.04, 1.39</td>
<td>1.09 0.93, 1.27</td>
</tr>
<tr>
<td>Antisocial Behaviour</td>
<td><strong>3.47</strong> 2.21, 5.43</td>
<td><strong>3.07</strong> 1.88, 5.03</td>
</tr>
<tr>
<td>Intervention</td>
<td>0.83 0.66, 1.03</td>
<td>0.81 0.65, 1.02</td>
</tr>
</tbody>
</table>

* * p < 0.05. ** * p ≤ 0.001

<sup>a</sup> Analyses were run separately for each predictor controlling only for Wave 1 alcohol use and excluding the other factors in the Table. The Parenting Style Groups identified from the Latent Class Analysis were entered as a group and compared to the Authoritative group.

<sup>b</sup> Analyses controlled for all predictors.
Correlations between predictor variables were examined and showed that none of the parenting variables were correlated above 0.64. This suggested that the regression results were not unduly influenced by colinearity between the measures.

5.5 Discussion

This present study represented one of the few longitudinal studies completed in large community samples that have accurately examined the predictive effect of parenting style on the development of adolescent alcohol use. A unique feature of the present study was that continuous domains of specific parenting behaviours were controlled for in examining the effect of categories of parenting style on the development of adolescent alcohol use.

The first hypothesis was supported in that parenting styles were identified from adolescent reports of parenting behaviours. In line with Baumrind, a four-latent-class model was found to be the best fit to the data. The second hypothesis that authoritative parenting would predict lower rates of alcohol use in adolescents, after controlling for specific parenting behaviour domains and other factors was not supported. The findings demonstrated that parenting styles did influence adolescent alcohol use in the partially adjusted model where the domains of parenting behaviours and other predictors were not included in the regression model. However, when the regression model was fully adjusted for the direct effects of family management, parental nurturance and other predictors, the effect of parenting style was no longer significant.

The finding that all four parenting styles were identified from adolescent reports of parenting behaviours extended Chan and Koo’s (2011) results, and was supportive of all four parenting styles being identified from a larger contemporary sample. In the present analysis, many of the groups
were characterised by divergence in evaluations of mother and family attachments. These results may reflect the fact that rates of family breakdown are higher relative to Baumrind’s context.

Contrary to the hypothesis based on Baumrind’s theory, parenting style was found to have no significant effect in predicting adolescent alcohol use after the direct effects of other factors were adjusted. This result is consistent with Engels et al. (2005) that a significant interaction effect was not found between two parenting domains in predicting adolescent alcohol use. The present findings suggest that the overall parenting style (i.e., the distinct balance of parental responsiveness and demandingness) may be less important than specific family management practices (i.e., setting clear rules and effectively monitoring behaviour) in predicting adolescent alcohol use.

The present study demonstrated parental nurturance measures were predictive of adolescent alcohol use in the partially adjusted models, but not significant after adjusting for the effect of family management and other factors. This is consistent with the majority of studies that have examined the effect of both parenting domains, and found that only parental monitoring was independently predictive of adolescent alcohol use (Aquilino & Supple, 2001; Barnes et al., 2000; Getz & Bray, 2005; Huh et al., 2006; Jackson et al., 1999; Webb et al., 2002). Some studies have found that parental warmth/nurture independently predicted adolescent alcohol use in analyses that controlled for family monitoring. Comparable studies differed from the present study in controlling for fewer factors. For instance, none of the variables controlled in the present study was controlled in Nash et al. (2005), Pires and Jenkins (2007) and Van Der Zwaluw et al. (2008). Brody and Ge (2001) and Brody et al. (2009) measured both parenting domains with a single variable. Latendresse et al. (2008) found the effect of parental warmth was less stable across time compared to parental monitoring, while fewer factors were adjusted than the present study.
In contrast with the majority of studies and the present findings, three prior studies found no effect for family management (Engels et al., 2005; Ennett et al., 2001; Kosterman et al., 2000). In the Ennett et al. (2001) study the measure of parental monitoring had a relatively low reliability (Cronbach’s alpha 0.50). Engels et al. (2005) found family functioning was the only familial variable that was significant in the adjusted analyses. It was likely that this variable captured aspects of the family environment that underlie family management. In Kosterman et al. (2000), family management was shown to be significant, but not after parental alcohol use was adjusted for.

The present findings in predicting adolescent alcohol use are in line with several studies (e.g., Aquilino & Supple, 2001) that found parental nurture domains were significant prior to full adjustment of other factors, but not after. These findings may be consistent with Barnes et al.’s (2000) proposition that parental support is indirectly related to adolescent alcohol use through monitoring.

In common with previous studies (Adalbjarnardottir & Hafsteinsson, 2001; Dishion, 1999; Shucksmith et al., 1997), the present study found that negligent parenting increases the likelihood of adolescent alcohol use relative to authoritative parenting. The present findings showed only a marginally significant difference between authoritative and permissive parenting styles as predictors of adolescent alcohol use (p=.055). However, Table 5.2 suggested differences in Year 7 rates of alcohol use between authoritative and permissive parenting styles. That a significant difference was not found may be due to the current sample size being slightly underpowered. The present finding that authoritative and authoritarian parenting predicted a similar longitudinal risk for the development of adolescent alcohol use was unexpected because it contradicted previous longitudinal studies (Adalbjarnardottir & Hafsteinsson, 2001; Shucksmith et al., 1997). It should be noted, however, that the present study was distinctive in controlling for Wave 1 alcohol use.
A key predictor in the present study was alcohol use in Wave 1. Previous studies have found that early adolescent alcohol use is a major predictor for later use in adolescence (e.g., Jackson et al., 1999; Webb et al., 2002). One of the strengths of the present study was that regression findings controlled for the effects of early adolescent alcohol use. It is possible that parenting has less effect on the development of adolescent alcohol use once adolescents begin using alcohol. In support of this explanation, reciprocal associations between adolescent alcohol use and parental behaviours were evident in longitudinal studies (Huh et al., 2005; Van Der Zwaluw et al., 2008).

Consistent with Engels et al. (2005) and Getz and Bray (2005), antisocial behaviour was found to increase the risk of adolescent alcohol use in both models. Although Huh et al. (2005) did not directly examine whether externalising behaviour predicts later alcohol use, they did demonstrate that externalising behaviour influences parenting. The present findings confirm that child antisocial behaviour and family management (parental monitoring) both independently predict adolescent alcohol use.

The partially adjusted results supported the view that bonding with parents is important in predicting adolescent alcohol use. However, this effect was no longer apparent once family management and other factors were included in the fully adjusted model. Although mediation analyses were not completed, the findings are compatible with Barnes et al. (2000) who found that family bonding acted indirectly by mediating parental monitoring practices. Parental bonds may be most important in childhood. However, as adolescents age, they spend less time at home and have a larger social network. It is possible that parental bonding continue to affect later adolescent behaviour indirectly by providing foundations for parents to effectively establish and enforce clear standards and an environment for adolescent communication (essential for monitoring) (Catalano &
Hawkins, 1996). Consistent with this proposition, Van Der Zwaluw et al. (2008) found the direct effect of parenting nurturing behaviours was only evident in younger adolescents.

### 5.6 Limitations

Before considering the implications of the present study, it is important to consider potential limitations. Firstly, it is important to recognise that while this study was longitudinal, the test for parenting effects on adolescent alcohol use was based on a non-experimental design. Specifically, the predictor variables were not subject to manipulation through intervention. Thus, the study cannot strongly claim to have identified causal effects. Secondly, the classification of parenting style was based on a specific selection of items and adolescent reports of parenting. It is possible that other methods of classifying parenting style may have produced different results. Future research should examine a wider range of items and different methods for classifying parenting style. For example, it may be important to look not just at adolescent reports, but also at the parents’ report of parenting style.

Thirdly, the present study did not control for some of the variables found to be important in previous studies (e.g., parental alcohol use; Kosterman et al., 2000). This might cause variability between the present findings and other studies. A number of scales had a relatively low Cronbach’s alpha and this may underestimate their impact on adolescent alcohol use. Finally, it should be noted these results cannot be generalised beyond the recruited sample within the metropolitan schools included in the current study. A relatively small proportion of the families within the recruited schools returned signed consent forms. Despite this problem, the participating students in this study reported similar rates of alcohol use compared to those in state-wide samples (Toumbourou et al.,
2013) and their perceptions of parenting style were concordant with previous studies. Future research should continue to study parenting style in a range of populations.

5.7 Implications for research and health promotion practice

In common with previous research, the current study shows that early adolescent alcohol use is a major predictor of later adolescent alcohol use. This finding confirms the importance of health promotion programs that seek to delay or prevent adolescent alcohol use. The present findings noted a trend for random assignment to the resilient families’ intervention to be associated with reduced levels of adolescent alcohol use. Although not reported here, the intervention was found to significantly reduce the amount and frequency of alcohol use (Toumbourou et al., 2013). One effective component of the intervention was the encouragement given to parents to set household rules that did not supply or allow adolescent alcohol use (Toumbourou et al., 2013). The current findings emphasise family management practices that include establishing clear rules for alcohol and drugs and effective monitoring practices as important actions that parents can adopt in efforts to reduce adolescent alcohol use.

Although parenting style did not directly affect adolescent alcohol use during early secondary school, Table 5.2 revealed that children in authoritative families entered secondary school (Year 7, Wave 1) with lower rates of alcohol use. This finding opens the possibility that there may have been benefits in earlier developmental periods. It was argued previously that secondary school parenting interventions targeting adolescent alcohol use may be usefully advised to focus on family management practices. It is plausible that the influence of parenting style may have more specific importance for preventing adolescent alcohol use in late childhood. Therefore, it may be advisable
to target family intervention/prevention programs for alcohol use in primary schools in countries such as Australia that have high rates of early adolescent alcohol use.

5.8 Conclusions

The present study found that adolescents could provide reliable (internally consistent) descriptions of parenting behaviours and these behaviours were utilised in latent class analyses to identify four parenting style groups that were comparable to the typologies described by Baumrind. The hypothesis that authoritative parenting would predict lower rates of alcohol use in adolescents was not fully supported. Family management was found to be a more direct predictor than parenting style of adolescent alcohol use during early adolescence. These findings have raised the need to critically evaluate the role of parenting style in prior research and to conduct further research across different developmental periods, using a wider range of measures, methods and theoretically guided approaches. Lastly, both empirical evidence and theory suggest that parenting-related interventions should target primary school age children and focus on family management constructs of setting rules and monitoring of early adolescents in order to achieve effective adolescent alcohol use prevention.
Chapter Six – The Influence of Parenting Style on Adolescent Cannabis Use

This chapter is prepared to be submitted to the Journal “Substance Use and Misuse”.

Abstract

The current study aimed to examine the predictive effect of Baumrind’s parenting style constructs on the development of adolescent cannabis use (illicit drug use). Specifically, the paper examines whether adolescent reports of parenting styles longitudinally predicted adolescents’ cannabis use two years later. Data from the “Resilient Family” evaluation project was used for this study. This data set comprised 2,081 adolescents who completed three waves of a longitudinal survey, with data collected in 2004, 2005, and 2006. The independent variables were indicators of Baumrind’s domains of parental nurturance (responsiveness) and demandingness, from wave one (collected in 2004). Data on adolescent reports of parental closeness were used as the measure of nurturance. Adolescent reports of family management were used to indicate demandingness. The dependant variable was adolescent self-reported cannabis use from wave three (2006). The current study used latent class modelling to investigate adolescent perceptions of parenting styles and multivariate regression to examine their predictive effect on the development of adolescent alcohol use. The latent class finding showed that adolescent reports were able to discriminate four parenting styles that resembled Baumrind’s model. Logistic regression analysis was used to test longitudinal effects and also included a range of predictors that are known to influence adolescent cannabis use and needed to be controlled for in testing the effects of parenting style. The finding showed that poor family management increased the risk of adolescent cannabis use; however, family attachment had no significant effect. Parenting style had no effect after controlling for parenting domains. Country of birth was identified as a strong protective factor that reduced adolescent cannabis use.

Keywords: Adolescent cannabis use, Longitudinal Research, Risk Factors, Parenting Styles, Parenting behaviour, Family management, Family attachment
6.1 Introduction

Cannabis is the most widely used illicit drug both in Australia (White & Smith, 2009) and in other developed nations (Johnston, O’Malley, Bachman & Schulenberg, 2012). Despite its illegal status, over a quarter of Australians at the age of 17 years (26.2%) had used cannabis at some time in their lifetime in 2008 (White & Smith, 2009).

The use of cannabis in adolescence is known to result in a number of harmful health and social consequences. There is evidence that adolescent cannabis use is associated with: driving offences (Papafotiou, 2005); increased risk for progression to other illicit drug use (Fergusson, Boden & Horwood, 2006); poorer employment, education and relationship outcomes (Fergusson & Boden, 2008) and; mental health problems including the development of psychosis (Van Os et al., 2002; Verdoux et al., 2002), increased risk of suicidal behaviour and deliberate self-harm (Patton et al., 1997) and depression and anxiety (Patton et al., 2002). There is also some emerging evidence that suggests that adolescent cannabis use may result in adverse neurological changes associated with mental health problems (Hall, Degenhardt & Teesson, 2004; Degenhart & Hall, 2001).

Population rates of cannabis use show differences across time, suggesting influencing factors may be subject to variation. For example in Australia, after a noted rise in cannabis use in 1998 among those sampled by the “National Drug Strategy Household Survey” (NDSHS), when 17.9 percent of respondents reported use in the past 12 months, there was a consistent decline in reported use to 12.9 percent in 2001, 11.3 percent in 2004 and 9.1 percent in 2007.

There is gender and age differences in rates of cannabis use (White & Smith, 2009). Tresidder and Shaddock (2008) reported that males (37%) were more likely to report having used cannabis than females (30%). In 2010 cannabis was the most commonly used illicit drug in
Australia, with about 1.9 million people aged 14 years or older having used the drug in the previous 12 months. Females were less likely than males to have used cannabis at any frequency. Males were twice as likely as females to have smoked cannabis in the previous week (5.2% for males compared with 2.6% for females). Fewer than 1 in 10 (8.8%) teenagers aged 12–17 years had used cannabis in the previous 12 months, but this proportion more than doubled to 1 in 5 (21.3%) among those aged 18–29 years. The largest proportion of people who had used cannabis in the last 12 months had used it once or twice in the year (34.6%), while 20.9% said they used it once a week or more. After removing the effects of different age structures, Indigenous Australians were 1.6 times as likely as non-Indigenous Australians to have recently used cannabis. Although there are likely to be important differences, rates of cannabis use for youth born outside of Australia are often not published in reports such as the “National Drug Strategy Household” survey (Australian Institute of Health and Welfare, 2011).

Despite its harmful effects, early age cannabis use is relatively common. According to the 2008 Australian national school student survey, 13.6% of students aged 12 to 17 years had tried cannabis (White & Smith, 2009). Given the negative consequences of early initiation to cannabis use, it is important to understand factors that influence this behaviour in school-age populations.

Different factors have been identified as factors that influence adolescent initiation to illicit drug use including genetics, environment (e.g., cannabis availability) and social influences such as parenting (Montgomery et al., 2008). It is possible that different factors influence the development of legally available drugs such as alcohol and illicit drugs such as cannabis (Hemphill et al., 2011; Kosterman et al., 2000). Amongst the social influence factors that impact illicit drug use, parenting style is considered to be one of the more important (Kosterman et al., 2000). Although the role of parents in the social development of their children has been extensively studied and shown to be
very important (e.g., Montgomery et al., 2008), research examining specific effects on illicit drug use is less extensive.

The current project focuses specifically on the influence of parenting style on the development of adolescent substance use. In an earlier chapter (chapter 4) the results of a systematic review of longitudinal studies was presented examining the impact of parenting style on adolescent substance (alcohol or drug) use. Of the 23 studies included only five had examined the effects of parenting style on cannabis use (Aquilino & Supple, 2001; Dishion et al., 1999; Getz & Bray, 2005; Kosterman et al., 2000; Pires & Jenkins, 2007) while a further five examined effects on general measures of illicit drug use (Adalbjarnardottir & Hafsteinsson, 2001; Brody et al., 2009; Dishion et al., 1999; Huh et al., 2006; Steinberg et al., 1994). However, all found a significant effect between at least one parenting domain and reduced adolescent substance use. The most consistently measured domain has been parental monitoring (e.g., Barnes et al., 2000; Cohen et al., 1994; Jackson et al., 1999; Steinberg et al., 1994; Webb et al., 2002). In most studies the unique or independent effect of the parenting dimensions was examined and showed that at younger ages nurture/support and demandingness (monitoring) make independent contributions to reducing adolescent substance use (e.g., Cohen et al., 1994; Barnes et al., 2000; Kosterman et al., 2000). Three of the reviewed studies revealed, nurturance, support and monitoring were multivariate predictors of adolescents substance use and demonstrated significant direct associations with lower alcohol use and behavioural problems (Adalbjarnardottir & Hafsteinsson, 2001; Chassin et al., 2005; Cohen et al., 1994). In another longitudinal study, Pierce et al. (2002) reported that the combination of high levels of parental support and control contributed to the reduction of adolescent smoking. Each of these studies showed a significant predictive impact on adolescent
From the previous studies, it appears that certain characteristics of the parent-child interaction are related to drug use (Clausen, 1996). Baumrind (1971, 1978) in a number of significant studies, proposed that parenting practices are characterised by two main dimensions: responsiveness (nurturance) and demandingness (Clausen, 1996). These dimensions combine to form “styles” of parenting that impact the healthy development of children. Accordingly, four of the most commonly accepted parenting styles are authoritative, authoritarian, permissive and neglectful (Montgomery et al., 2008).

According to Baumrind (1991), “Authoritative” parents are those who apply high demandingness and high responsiveness (nurturance) in interaction with their children, while authoritarian parenting demonstrates less responsiveness (nurturance/warmth), but still enforces inflexible control on behaviour. Permissive parents indulge their children, offering much parental responsiveness with little control (Montgomery et al., 2008). As a result of being raised by authoritative parents, children often display higher level of behavioural, emotional, and psychological adjustment (Stephenson et al., 2010).

Several studies confirm nurturance, support and monitoring as multivariate predictors of adolescent’s substance use and demonstrated significant direct associations with behavioural problems (Adalbjarnardottir & Hafsteinsson, 2001; Chassin et al., 2005; Cohen et al., 1994). In one longitudinal study, Pierce et al. (2002) reported that the combination of high levels of parental support and control contributed to the reduction of adolescent smoking. In general, a high level of nurturance is related to overall adolescent competence, fewer behaviour problems and lower levels of depression and anxiety (Broman, Reckase & Freedman-Doan, 2006). Children who perceive...
their parents as neglectful are at greatest risk of behaviour such as delinquency, risky sexual behaviour and drug and alcohol misuse.

Research suggests that certain parenting styles are linked with the tendency for substance use among adolescents. For example, children of authoritative parents were less likely to use illicit substances than those of neglectful parents. Some studies found that adolescents who rated their parents more highly on these dimensions had lower tobacco and ‘other drug’ consumption (Montgomery et al., 2008). Baumrind (1989) conducted a small longitudinal study to examine the influence of parenting styles on adolescent competence and substance use and she found that parents with authoritative parenting styles were more successful in protecting their adolescents from drug use problems relative to authoritarian parents. Other studies revealed that children of parents who exhibited little warmth and control increased significantly their drug use during adolescence, whereas children who perceived their parents as high in both warmth and control were less inclined to do so. In an initial investigation, another group of researchers found that adolescents from low control families used drugs significantly more than those from high control families. Furthermore, at follow up substance use remained less prevalent among those from high control families (Montgomery et al., 2008).

In investigating the effects of parenting style on adolescent substance use it is important to control for factors that may influence these factors. Rates of cannabis use are known to vary by gender (Tresidder & Shaddock, 2008), parents country of birth (Rowland et al., 2003) and to be affected by family breakdown (Dishion & Loeber, 1985; Fergusson & Horwood, 1997; Duncan, Tildesley, Duncan & Hops, 1995). Parenting styles may also vary according to these factors. Child behaviour problems are an additional factor that may influence both parenting style and the risk of substance use (Hawkins et al, 1992; Dishion & Loeber, 1985).
The conceptualisation of parenting styles assumes that the balance of parent responsiveness and demandingness will be a more important influence on the child than specific parent behaviours. To date, there has been little empirical research investigating this proposition. As it was examined in earlier chapter (chapter five), the effect of parenting style on adolescent alcohol use, after controlling for specific parenting behaviours, showed that family management was a more direct predictor than parenting style on adolescent alcohol use during early adolescence. The current study sought to investigate whether there were effects of parenting style on cannabis use after controlling for the same factors.

Given that different forms of adolescent substance use appear to be motivated by different risk processes (Toumbourou et al., 2005), it will be imperative to find whether specific styles of parenting are associated with a propensity to use specific forms of illicit drug use (Montgomery et al., 2008). Consequently, the current study aimed to examine whether parenting style predicts adolescent’s cannabis use. The hypothesis was that adolescents who perceive authoritative parents would be less likely to initiate cannabis use than those who have parents with other parenting styles and this effect would be maintained after controlling for specific parenting behaviours and other risk factors.

### 6.2 Methods

The “Resilient Families Research Initiative” (RFRI) is a prospective cluster randomised controlled trial evaluating the effectiveness of the resilient families program (Australian Clinical Trial Registry Number: 012606000399594). The resilient families program is an early secondary school intervention program (from Years 7 through to 9) designed to develop family support networks and reduce early adolescent experience of health and social problems. The RFRI
comprised: (1) a school-based student curriculum designed to promote adolescent resilience and healthy family relationships; (2) parent education evenings delivered using the “Parenting Adolescent Quiz” (PAQ) and designed to assist parents in promoting healthy adolescent development (Toumbourou et al., 1999); (3) sequenced parent education groups delivered over eight-weeks using the “Parenting Adolescents: A Creative Experience” (PACE) program (Jenkin & Bretherton, 1994), and; (4) a handbook for parents and carers designed to further assist parents in supporting their adolescent child (Jenkin & Toumbourou, 2005). Shortt and colleagues have detailed the RFRI components (Shortt, Toumbourou & Chapman, 2006; Shortt, Toumbourou, Chapman & Power, 2006).

6.2.1 Measures

Adolescents were administered the paper questionnaires during a standard classroom period. Different factors such as family, peer and school domains were measured. Unless otherwise stated, scales were and items were from “Community that Care” (CTC) youth survey (Arthur et al., 2002; Glaser Van Horn, Arthur, Hawkins & Catalano, 2002). Responses were recorded using the following 4-point scale: 1 “YES!”, 2 “yes”, 3 “no”, 4 “NO!”.

Scale scores consisted of the average across the included items.

6.2.1.1 Parenting style groups

Parenting style groups were identified using “Latent Class Analysis” (LCA) to model responses to the 17 items (described below) referencing parental demandingness and nurturance. Parental demandingness was assessed using the CTC family management scale which is a well-validated measure incorporating items relevant to family rules and monitoring. The scale consists of the following six items: “Would your parents know if you did not come home on time; The rules in
my family are clear; My family has clear rules about alcohol and drug use; My parents ask if I’ve finished my homework; When I am not home, one of my parents knows where I am and who I am with; My parents want me to call if I’m going to be late home” (Cronbach’s Alpha = 0.72).

Parental nurturance was measured with adolescent reports on four CTC scales assessing parental closeness and communication. Family opportunities consisted of the following three items: “If I had a personal problem, I could ask my mum or dad for help; My parents give me lots of chances to do fun things with them; My parents ask me what I think before most family decisions affecting me are made” (Alpha = 0.75). Family rewards, two items: “My parents notice when I am doing a good job and let me know about it; How often do your parents tell you they’re proud of you for something you’ve done”. Response options were: 4 “All the time”, 3 “Often”, 2 “Sometimes” and 1 “Never or Almost Never”. (Alpha = 0.67). Attachment to Mother, three items: “Do you feel very close to your mother; Do you share your thoughts and feelings with your mother; Do you enjoy spending time with your mother” (Alpha = 0.78). Attachment to father based on the same three items with the referent changed to “Father” (Alpha = 0.83, coded such that higher scores reflect attachment).

6.2.1.2 Cannabis use

Have you ever used marijuana? Responses were categorized to two groups: cannabis users (lifetime) and non-users.

6.2.1.3 Wave 1 variables

Antisocial behaviour was assessed based on nine items. Four items from the CTC survey asked about past behaviour: Stolen something; Physically attacked someone; Carried a weapon; Been arrested. Response options were: 0 “Never” to 2 “Yes, in the last year”. Five items were from
the “Strengths and Difficulties Questionnaire” (SDQ) (Goodman, 2001): I get very angry and often lose my temper; I usually do as I am told (reverse-scored); I fight with others; I am accused of lying or cheating; I take things that are not mine. Response options: 0 “Never”, 1 “Somewhat True”, 2 “Certainly True” (Alpha 9-items = 0.73). Academic failure was assessed by one item asking: “Putting them all together, what were your marks like last year?” Response options: 1 “Very Good”, 2 “Good”, 3 “Average”, 4 “Poor”, 5 “Very Poor”. Demographics factors were assessed based on student responses to questions on: female gender; whether country of birth was outside Australia and; whether parental marital status was separated/divorced or other. Alcohol use also was measured by asking the participants: Have you ever had more than just a sip or two of an alcoholic beverage (like beer, wine or liquor/spirits)? And finally cigarette use was measured: Have you ever smoked cigarettes?

6.2.2 Participants and procedure

The present study analysed data from a longitudinal study that has measured adolescent behaviour in the context of parenting and parent-adolescent relationship in order to evaluate the RFRI. Prior to the baseline survey, fifty-six schools were identified within the initial sample frame for participation in the RFRI. These schools were part of a separate study of the development of adolescent behaviour (McMorris et al., 2007), and had previously been randomly selected using a probability proportionate to grade-level size procedure (Kish, 1965). Thirty-nine schools were randomly selected to participate in the RFRI resulting in a state-wide representative sample of adolescents, stratified based on education sector (government or independent), and socio-economic status (indicated by the Education Maintenance Allowance, a funding system assisting low income families with their child’s education [low, medium, high]). Schools were geographically dispersed
within metropolitan Melbourne, and matched on the criteria (1) government or independent/catholic education sector, (2) socio-economic status, (3) ethnicity, and (4) school size.

Twenty-four schools agreed to participate (62% participation rate). Prior to being approached, twelve schools were randomised to intervention and conducted the resilient families program over 2004-2005 and the remaining twelve schools were randomly assigned to be approached as usual practice controls. For the current study, the total eligible survey population across the 24 schools consisted of students in the first year of secondary school in 2004 (Year 7, mean age = 12.3 years, SD = .50, n = 4,404). Only eligible students whose parents returned signed consent forms were approached at the baseline survey (n = 2,356, 53% of the eligible sample). Students provided their consent to participate on the day of the survey. Adolescents were resurveyed after 2-years (Year 9 mean age = 14.5 years, SD = .50). The present analysis is based on 2,081 students from Metropolitan Melbourne (47% of the eligible sample, 88% of the consenting sample; who were studying in Year 7 at baseline) whose parents provided signed consent and who responded to all relevant items at the two surveys. Of the sample included in this analysis: 55.9% were female; 9.4% were born outside Australia; and for 20.9% parents marital status was separated or divorced.

The present longitudinal analysis was based on the 2081 adolescents who responded to the survey at three waves of data collection.

Adolescents responded to the paper questionnaires during a standard classroom period under the supervision of research staff. Students that were no longer in their original schools were followed-up and surveyed in their new school location.
6.3 Analysis

For the latent class models, preparation of items was done using STATA version 12 (StataCorp, 2011). All LCA models were fit using SAS® version 9.2 for Windows1 (Lanza et al., 2010). LCA was used in identifying the parenting style groups from the responses to the 17 items assessing parental demandingness and nurturance. LCA models sought to identify whether item responses shared associations through a small number of discrete latent classes. Models were compared with different numbers of classes with model selection based on (1) minimising “Akaike Information Criterion” (AIC) and “Bayesian Information Criterion” (BIC) and (2) the reliability of the model convergence across 1,000 trials.

STATA software was used for logistic regression analyses predicting cannabis use at Wave 3 from predictors measured at Wave 1. Cannabis use at Wave 3 was found to be significantly associated with the classroom clustering of respondents at the Wave 1 survey (intra class correlation = 0.02), hence all analyses were adjusted for classroom clustering. Regression models sought to identify predictors that increased cannabis use from Wave 1 to Wave 3, hence all models controlled for Wave 1 cannabis use. The logistic regression analyses were presented in two models. In the partially adjusted models, analyses were run separately for each predictor controlling only for Wave 1 cannabis use and not adjusting for other factors. In these analyses the parenting style groups identified from the LCA were entered as a group and compared to the authoritative group. In the fully adjusted models, multivariate analyses controlled for all predictors.

1 Copyright 2011 SAS Institute Inc. SAS and all other SAS Institute Inc. product or service names are registered trademark or trademarks of SAS Institute Inc., Cary, NC, USA
6.4 Results

6.4.1 Latent class analysis of parenting style groups

“Latent Class Analysis” revealed that the assumption that items were associated with underlying classes or groups was a better fit to the data than models with no groups. The drop in AIC and BIC plateaued from models with six or more groups. The four group model was selected based on its reliable convergence (100% convergence to the same solution across 1,000 trials) while the five group model was unreliable (35% convergence) and less interpretable. Average responses to the five family scales and percentages reporting cannabis use at Wave 1 and 3 are presented for the four parental classes in Table 6.1.

Table 6.1

Descriptive statistics for Wave 1 variables and percentage reporting cannabis use in Wave 1 and Wave 3 of each latent class group

<table>
<thead>
<tr>
<th>Latent Class Group</th>
<th>Class 1</th>
<th>Class 2</th>
<th>Class 3</th>
<th>Class 4</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpretation</td>
<td>Authoritarian n = 227</td>
<td>Authoritative n = 1186</td>
<td>Permissive n = 489</td>
<td>Neglectful n = 179</td>
<td>Sample N = 2081</td>
</tr>
<tr>
<td>Wave 1 Variables</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Family Rewards</td>
<td>2.96</td>
<td>0.78</td>
<td>3.42</td>
<td>0.63</td>
<td>2.98</td>
</tr>
<tr>
<td>Mother Attachment</td>
<td>3.45</td>
<td>0.50</td>
<td>3.74</td>
<td>0.32</td>
<td>3.02</td>
</tr>
<tr>
<td>Father Attachment</td>
<td>1.91</td>
<td>0.60</td>
<td>3.60</td>
<td>0.41</td>
<td>3.06</td>
</tr>
<tr>
<td>Family Opportunities</td>
<td>3.16</td>
<td>0.55</td>
<td>3.59</td>
<td>0.41</td>
<td>2.91</td>
</tr>
<tr>
<td>Family Management</td>
<td>1.51</td>
<td>0.42</td>
<td>1.30</td>
<td>0.32</td>
<td>1.61</td>
</tr>
<tr>
<td>% 95CI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cannabis Use</td>
<td>1.3</td>
<td>0 – 2.8</td>
<td>0.3</td>
<td>0 – 0.7</td>
<td>1.2</td>
</tr>
<tr>
<td>Wave 3 Variables</td>
<td>Cannabis Use</td>
<td>11</td>
<td>6 – 15</td>
<td>7</td>
<td>5 – 8</td>
</tr>
</tbody>
</table>

Note. 95CI = 95% Confidence Interval
6.4.2 Regression analysis predicting cannabis use

To find out whether parenting dimensions and indicators of parenting styles had any predictive effect on adolescents’ cannabis use, a logistic regression model was developed and the results are as below.

Table 6.2 presents the logistic regression findings predicting Wave 3 (W3) cannabis use from parenting style and other factors. The first model (Table 2) is partially adjusted and presents only the effect of parental style classes adjusted for Wave 1 cannabis use. The second model is multivariate adjusted for all predictors at Wave 1.

Table 6.2 (Model 1) presented the partially adjusted logistic regression model predicting the prevalence of current cannabis use at W3 (n=2,081) from the parenting style groups, adjusting for W1 cannabis use, but without adjusting for other predictors. The findings showed that those adolescent whose parents were classified into the authoritative parenting style group were at less risk of alcohol use in W3, relative to those from other groups. The partially adjusted model showed that having parents with a permissive and neglectful parenting style was related to cannabis use later in Wave 3; and also a range of other factors were associated with Wave 3 cannabis use.

The multivariate fully-adjusted logistic regression model predicting current cannabis use (W3) is presented in Table 6.2 (Model 2). The result showed no significant relationship between cannabis use and the four parental nurturance scales; however poor family management and Australian birth were significant risk factors. The parenting style groups were not significant, after adjusting for other effects. The results revealed that having reported alcohol and cigarette use in W1 increased the likelihood of cannabis use in W3. Externalizing behaviour was an additional risk factors.
Table 6.2

Logistic regression predicting Wave 3 cannabis use from variables measured in Wave 1

<table>
<thead>
<tr>
<th>Wave 1 Predictors</th>
<th>Partly Adjusted Model</th>
<th></th>
<th></th>
<th></th>
<th>Fully Adjusted Model</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
<td>p</td>
<td>OR</td>
<td>95% CI</td>
<td>p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parenting Style</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c2 Authoritative (referent)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c1 Authoritarian</td>
<td>1.52</td>
<td>0.93</td>
<td>2.48</td>
<td>0.096</td>
<td>0.85</td>
<td>0.40</td>
<td>1.83</td>
<td>0.684</td>
</tr>
<tr>
<td>c3 Permissive</td>
<td>1.78</td>
<td>1.25</td>
<td>2.52</td>
<td>0.001</td>
<td>1.01</td>
<td>0.60</td>
<td>1.67</td>
<td>0.977</td>
</tr>
<tr>
<td>c4 Neglectful</td>
<td>2.80</td>
<td>1.78</td>
<td>4.40</td>
<td>0.000</td>
<td>0.73</td>
<td>0.32</td>
<td>1.66</td>
<td>0.452</td>
</tr>
<tr>
<td>Family Rewards</td>
<td>0.67</td>
<td>0.57</td>
<td>0.79</td>
<td>0.000</td>
<td>0.81</td>
<td>0.64</td>
<td>1.03</td>
<td>0.087</td>
</tr>
<tr>
<td>Mother Attachment</td>
<td>0.65</td>
<td>0.51</td>
<td>0.82</td>
<td>0.000</td>
<td>0.91</td>
<td>0.64</td>
<td>1.28</td>
<td>0.581</td>
</tr>
<tr>
<td>Father Attachment</td>
<td>0.73</td>
<td>0.61</td>
<td>0.87</td>
<td>0.001</td>
<td>0.90</td>
<td>0.63</td>
<td>1.28</td>
<td>0.562</td>
</tr>
<tr>
<td>Family Opportunities</td>
<td>0.69</td>
<td>0.55</td>
<td>0.87</td>
<td>0.002</td>
<td>1.27</td>
<td>0.86</td>
<td>1.88</td>
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<td>2.20</td>
<td>3.72</td>
<td>0.000</td>
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<td>1.21</td>
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<td>1.16</td>
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<td>1.12</td>
<td>0.77</td>
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<td>0.15</td>
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<td>0.17</td>
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<tr>
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<td>2.47</td>
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<td>0.87</td>
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<td>4.83</td>
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<td>1.84</td>
<td>1.28</td>
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<td>6.56</td>
<td>37.86</td>
<td>0.000</td>
<td>2.10</td>
<td>0.74</td>
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<td>4.02</td>
<td>9.01</td>
<td>0.000</td>
<td>2.85</td>
<td>1.80</td>
<td>4.51</td>
<td>0.000</td>
</tr>
<tr>
<td>Academic Failure</td>
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<td>1.19</td>
<td>1.72</td>
<td>0.000</td>
<td>1.08</td>
<td>0.87</td>
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<td>10.11</td>
<td>0.000</td>
<td>2.75</td>
<td>1.59</td>
<td>4.76</td>
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<tr>
<td>Intervention</td>
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<td>0.776</td>
<td>0.86</td>
<td>0.60</td>
<td>1.23</td>
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OR = Odds Ratio. 95% CI = 95 % Confidence Intervals

6.5 Discussion

The present longitudinal study was the first that has examined the unique effect of parenting style, specifically authoritative parenting, as a potential risk factor for adolescent cannabis use. The
findings did not support the hypothesis, that adolescents who perceive authoritative parents would be less likely to use cannabis than those who have parents with other parenting styles. Results indicated that parenting style was not a significant predictor for cannabis use, after adjusting for the direct effect of family management and other risk factors.

Prior to the present study there has been limited investigation of the potential for early adolescents to identify parenting style categories. The finding in the present study that all four parenting styles were modelled from adolescent reports of parenting behaviours extended Chan and Koo’s (2010) results, and was supportive of all four parenting styles being identified from a larger contemporary sample. In the present analysis, many of the groups were characterised by divergence in evaluations of mother and family attachments. These results may reflect the fact that rates of family breakdown are higher relative to Baumrind’s context.

There has been no previous study that has examined the longitudinal effect of parenting style on adolescent cannabis use in a design that controls for specific parenting behaviours. Prior studies examined illicit drug use, in general and have not controlled for specific parenting behaviours. For example, Baumrind (1989) conducted a small longitudinal study to examine the influence of parenting styles on adolescent competence and substance use and she found that parents with authoritative parenting styles were more successful in protecting their adolescents from drug use problems relative to authoritarian parents.

A number of longitudinal studies have also followed after Baumrind by investigating the prospective relationship between different parenting domains and adolescent substance use. Adalbjamardottir and Hafsteinsson (2001) studied the effect of parenting style (authoritative, authoritarian, indulgent, neglectful) and adolescent substance use (cigarette smoking, alcohol use, illicit drug use). The results supported the view that young people exposed to authoritative
parenting showed reduced substance use outcomes. However, they did not control for the potential
effect of specific parenting behaviours.

Dishion et al. (1999) examined poor parental discipline and onset of substance use (frequent
tobacco, alcohol and cannabis use). Poor discipline significantly predicted higher onset of alcohol,
tobacco and cannabis use. Controlling for parental discipline, poor monitoring predicted an
increased likelihood of cannabis use. Kosterman et al. (2000) measured the predictive effect of
proactive family management (demandingness) on alcohol and cannabis initiation. The results
showed that parents’ proactive family management practices decreased the likelihood of cannabis
initiation. Steinberg et al. (1994), studied the effect of parental demandingness on the frequency
“severity” of adolescent poly substance use (different forms of substance use), controlling for peer
influence. In unadjusted analyses high parental monitoring predicted lower longitudinal transitions
to substance use. Among girls, however, parental monitoring predicted lower substance use
initiation, after controlling for peer group substance use. Monitoring did not predict substance use
de-escalation.

The findings of the current study demonstrated that poor family management significantly
increased the risk of cannabis use; however, family attachment had no significant effect after
adjusting for other factors. Although authoritative parenting had no significant effect on cannabis
use in the multivariate analyses, authoritative parenting style predicted lower rates of cannabis use
in unadjusted analyses.

Other variables were identified in this study to be predictors of cannabis use which were
consistent with past research. In the current study early cigarette and alcohol use and externalizing
were all found to independently increase the risk of adolescent cannabis use at Wave 3.
The present study found the “Resilient Families” intervention had no effect on cannabis use. Prior studies have found the intervention was effective at reducing frequent and heavy alcohol use at Wave 3 (Toumbourou et al., 2013), with this effect mediated by intervention impacts in encouraging parents to set rules not to supply or allow adolescent alcohol use. The current findings suggest that in order to prevent adolescent cannabis use, the “Resilient Families” intervention would have needed to more effectively target parents with high-risk adolescents that were using alcohol and tobacco and experiencing externalizing problems at the start of secondary school.

6.6 Limitations

The current study included a large sample and had a longitudinal design, which were important strengths of the study. However, there were a number of potential limitations. It is important to recognize that while this study was longitudinal, the test for parenting effects on adolescent cannabis use was based on a non-experimental design. Specifically, the predictor variables were not subject to manipulation through intervention. Thus, the study cannot strongly claim to identify causal effects.

Secondly, the present study did not control for some of the variables found to be important in previous studies (e.g., parental alcohol use; Kosterman et al., 2000). This might cause variability between the present findings and other studies. A number of scales had a relatively low Cronbach’s alpha and this may underestimate their impact on adolescent alcohol use.

Thirdly, the classification of parenting style was based on a specific selection of items measuring adolescent reports of parenting. It is possible that other methods of classifying parenting style may have produced different results. Future research should examine a wider range of items
and different methods for classifying parenting style. For example, it may be important to look not just at adolescent reports, but also at the parents’ report of parenting style.

Finally, it should be noted these results cannot be generalized beyond the recruited sample within the metropolitan schools included in the current study. A relatively small proportion of the families within the recruited schools returned signed consent forms. Despite this problem, the participating students reported similar rates of substance use to those in state-wide samples (Toumbourou et al., 2013) and their perceptions of parenting style were concordant with previous studies. Future research should continue to study parenting style in a range of populations.

6.7 Implications for research and health promotion practice

An important finding of the current study was that the specific parental monitoring behaviour was a more direct predictor of adolescents’ cannabis use than parenting style. As previously reported in chapter five, parental monitoring also predicted adolescent alcohol use. Hence, the current findings suggest family management practices that include effective monitoring may be important actions that parents can adopt in efforts to reduce both adolescent cannabis and alcohol use. Future research should also examine underlying family processes that might explain why being a child from a non-Australian country of birth was protective in reducing cannabis use.

The current study found that rates of cannabis were 1% at the start of secondary school and increased to 10% two years later. These findings suggest that efforts to prevent adolescent cannabis use may play an important role during the early secondary school period. Findings demonstrated that adolescents using alcohol or tobacco or reporting externalizing problems were at greater risk of initiating cannabis use in Wave 3. These findings suggest that prevention approaches that reduce
youth alcohol or tobacco use and externalizing problems may also contribute to preventing the initiation of cannabis use.

The current findings suggest the need to continue investigating the effect of parenting style on adolescent cannabis use in large longitudinal samples. Although parenting style did not directly affect adolescent cannabis use during early secondary school, Table 6.1 and the unadjusted findings in Table 6.2 revealed that adolescent in authoritative families maintained lower rates of cannabis use in Year 9 (Wave 3), compared to those in the other parenting style groups. It remains possible that the preventative benefits of authoritative parenting styles may become more apparent in later periods of adolescence where rates of cannabis use are known to further escalate.

6.8 Conclusions

The present study found that adolescents could provide reliable and valid descriptions of parenting behaviour that could be used to model the four parenting style groups described by Baumrind. The hypothesis that authoritative parenting would predict lower rates of cannabis use in adolescents was not supported. Family management was found to be a more direct predictor of adolescent cannabis use during early adolescence. These findings have raised the need to critically evaluate the role of parenting style in prior research and to conduct further research using a wider range of measures and theoretically guided approaches. Finally, evidence from the present study suggests that in order to prevent adolescent cannabis use, family interventions such as resilient families may need to include strategies to recruit and effectively assist families with high-risk adolescents that use alcohol and tobacco and experience externalizing problems at the start of secondary school.
Chapter Seven – Associations between Ethnicity and the Development of Adolescent Substance Use

This chapter has been prepared to be submitted to the Ethnicity and Health Journal.
Abstract

Australia is a multicultural country experiencing rapid in-migration. One of the challenges for new migrants is to adjust to different parenting expectations within the Australian culture. The experience of migrant families provides insights into cultural variations in parenting behaviours and whether there are universal or cultural-specific parenting differences on adolescent adjustment. This study utilised a large longitudinal study of adolescents in secondary schools in Melbourne, Australia (N=2,080) to examine parenting behaviour and its association with the development of adolescent alcohol and cannabis use among adolescents. Cross-sectional analyses of adolescent reports at the first survey (Year 7, average age 13 years in 2004) revealed that mother attachment, family rewards, and family opportunities were generally higher along with higher alcohol use for Australian-born adolescents and those speaking English at home. Indeed both non-Australian birth and non-English home language at Year 7 were found to uniquely predict lower rates of alcohol and cannabis use in Year 9, after controlling for other risk factors. Overall, parenting behaviours were found to have similar longitudinal effects on adolescent alcohol and cannabis use regardless of culture.

Keywords: Ethnicity, Adolescent substance use, Longitudinal Research, Risk Factors, Parenting Styles, Parenting behaviour, Family management, Family attachment
Chapter Seven: Ethnicity, Parenting Style and Substance Use (Empirical Study Three)

7.1 Introduction

Australia is a multicultural society experiencing rapid in-migration from a range of other countries. This trend has had an important effect on the cultural diversity of Australia's population. In The 2011 Census of Population and Housing reported that of Australia's 21.5 million people, about one quarter were born overseas, with a further 20% of residents having at least one parent born overseas. Over half (53%) of the population are third-plus generation Australians; those having one or more of their grandparents who may have been born overseas or who may have several generations of ancestors born in Australia (Australian Bureau of Statistics [ABS], 2011). According to the Australian Bureau of Statistics (2011) in 2009-10, Australia had 6.3 million families of which 40% (2.5 million) were migrant families and 60% (3.8 million) were non-migrant families. In 2009-10, of the 5 million children aged 0 to 17 years in Australia, 417,700 (8.3%) were born overseas, with around 60% of these arriving between 2005 and 2010. Significantly more overseas born children (82%) lived in intact families, than Australian born children (73%), with most (80%) living with both of their natural parents (compared with 75% Australian born children). Significantly less overseas born children lived in one parent families (10%) compared with Australian born children (18%). There were similar levels of overseas born children and Australian born children living in step and blended families (7% and 9% respectively). To qualify as a 'migrant family' for this article at least one 'key member' (parent or child) of the family was born overseas. Cultural diversity is often described in terms of whether the countries of origin are classified as main English speaking or otherwise (ABS, 2001). The study of cultural differences is described in different ways in Australia. Typical indicators include non-Australian birth and non-English language spoken at home. Many studies refer to
cultural and linguistic diversity (Rowland et al., 2003). In the current study these differences are described as “cultural diversity”.

The experience of migrant families provides insights into cultural variation in parenting behaviours and whether parenting has universal or culturally-specific effects on adolescent adjustment. The adolescent adjustment occurs here in the context of acculturation; it is usually a challenge for migrants from culturally diverse backgrounds to acculturate into the new country. Acculturation refers to an ongoing process through which people from one culture adjust to another culture modifying their attitudes and behaviours as a result of the contact with the new culture (Berry, 1970). An important part of acculturation is the adoption of the language and customs in the new country. With respect to customs, the acculturation process may also include expectations to adopt the parenting/child-rearing practices in the new country (Farver et al., 2007); this can be a challenge as migrants may be reluctant to give up traditional and cultural approaches to parenting (Julian, McKenry & McKelvey, 1994). Some studies suggested that effective parenting practice may decrease when family stress increases and this can result in differential acculturation between parents and youth. A greater level of differential acculturation between parents and youth has been associated with a greater likelihood of future youth substance use (Martinez, 2006).

Alcohol and drug use are important health behaviours that arise during adolescence. Examining these behaviours in culturally diverse groups provides a glimpse of the influence of acculturation on one aspect of adolescent development. However, there has been limited research that has examined alcohol or drug use among the migrant population. There was a lower rate of alcohol and drug use amongst Non-English speaking Australians compared with others in 2000 according to the Australian Institute of Health and Welfare (Rowland et al., 2003). The rate of
risky alcohol use in 2010 in the non-English speaking group was substantially lower at 5.4% compared to 21.6% for the English speaking population. Tobacco (cigarette) use was lower (65 versus around 105), as well as any illicit drug use including cannabis (3.6% versus 10.8%) (Australian Institute of Health and Welfare, 2011). The Australian National Drug Strategy Household Survey in 1998 also found lower rates of alcohol, tobacco and other drug use amongst Australians from non-English speaking groups.

Furthermore, the results of a series of surveys conducted by the “Drug and Alcohol Multicultural Education Centre” (DAMEC) in Sydney found that alcohol and drug use were not the main issues in Australian ethnic groups. Some other studies showed that young people from non-English speaking backgrounds or those who were born outside Australia were less likely to use illicit drugs (Rowland et al., 2003). These findings are in contrast with US data that showed high rates of drug use in Latino communities and Spanish speakers (Rowland et al., 2003, Rowland et al., 2014).

The findings of studies so far suggest that a non-Australian birth tends to be a protective factor associated with lower rates of adolescent alcohol and drug use. Therefore it is necessary to understand which specific characteristics of non-Australian born people or parenting styles offer protection. A Victorian review found that some family factors such as parenting skills and specifically skills for maintaining child discipline and control and parent-child relations may explain the different rates of adolescent substance use in culturally diverse groups (Rowland et al., 2003). Maher et al. (1998) reported that establishing rules and good parental supervision were protective factors against substance use among adolescents from some cultural groups. In interviews with community practitioners, many noted that in culturally diverse families parenting
styles and family dynamics sometimes acted as protective factors that reduced youth substance use (Rowland et al., 2003).

There is a vast body of research that suggest that migrants entering Western nations that are similar to Australia, are challenged by the fact that parenting approaches tend to be less authoritarian than traditional approaches in many non-Westernised countries (Md-Yunus, 2006). Harkness and Super (1995) reported that child raising attitudes in culturally diverse groups can result in variation in adolescent behaviour. Parenting plays an important role in the conveyance of cultural values and practices to youth in a specific cultural setting, helping youth to be socially accepted and integrated into their community (Harkness & Super, 1995). Barry et al. (2009) observed that cultural factors are important to consider in traditional child-rearing attitudes and behaviours.

According to the United States (US) Bureau of Census (2000), there are 14.5 million (4.7%) Asian-Americans living in the US. A number of studies have examined the parenting practices of Asian Americans. Observers note that norms regarding child rearing differ amongst Asian Americans relative to parents born in the US (Chiu, 1987); and as a result, Asian Americans may experience acculturation difficulties adjusting their parenting practices to US norms (Barry, Bernard & Beitel, 2009).

Parenting styles refer to stable patterns and combinations of parenting behaviour that characterise specific parents over time. Researchers have argued that differences in parenting styles maybe an important factor associated with different behavioural outcomes for adolescents from culturally diverse backgrounds (e.g., Baumrind 1971; Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994) (Farver et al., 2007). For example authoritative parenting may be beneficial in protecting youth in European and American families from problems such as alcohol
and drug misuse (e.g., Jackson-Newsom, Buchanan & McDonald, 2008; Steinberg et al., 1994). However there have been few studies conducted to examine whether authoritative parenting is beneficial for youth in other cultural contexts (Farver et al., 2007). The influence of parenting style on youth outcomes may differ across different ethnic groups (Jackson-Newsom et al., 2008).

In addition, different ethnic groups may have different concepts or interpretations of authoritarianism toward children (Md-Yunus, 2006). Patel (1999) found that Asian American parents from India were more controlling compared to Euro-Americans who tended to encourage more independence, to place less emphasis on achievement, and to be more nurturing. According to Zhao (2002), in Asian cultures learning through active exploration and curiosity is impolite and children should be quiet and self-controlled while in Euro-American culture, parents believe that children should be enthusiastic and spontaneous and show interest in exploring. According to Md-Yunus, (2006) Western children are generally brought up as autonomous and self-directing, while in general, Asian American parents who follow their traditional child rearing values are quite controlling, restrictive and at the same time protective of their children. Asian American parents have been described as more likely to be adopting authoritarian parenting styles compared to European American parents (Jackson-Newsom et al., 2008; Md-Yunus, 2006) who have a tendency to be less involved in their children’s lives (Farver et al., 2007) and endorse individualism, individual achievement, competition and material well-being (Hill, 2006).

A number of studies have compared European American parents with African American parents, and in some studies African American parents have been found to be more restrictive and authoritarian (Deutsch et al., 2012). African American parents have been found to focus on interdependence and security and show lower levels of emotional support towards their children.
and apply more discipline and authority (Hill, 2006; Weis & Toolis, 2010). Physical discipline is also one of the other strategies used more commonly by African American parents to gain their children’s compliance. Respect for authority and quick compliance with adults’ commands have been reported as very important values in the culture of African American parents (Weis & Toolis, 2010). Given that authoritarian parenting practices and the use of harsh control are normative amongst African-American parents, it has been argued that parenting styles that include these practices may lead to beneficial outcomes for African-American children but to negative outcomes among European American children (Deutsch et al., 2012).

Within Hispanic American families, family closeness, close interpersonal family relations, respect from adults, and traditional gender roles have been identified as important values that parents adopt to promote youth well-being (Lorenzo-Blanco, Unger, Baezconde-Garbanati, Ritt-Olson & Soto, 2012). Pinderhughes and Hurley (2008) compared Hispanic American and Euro American parents and differences in parenting behaviours, although in some instances such as in the use of monitoring, the differences were small.

The present study aimed firstly to examine differences in culturally diverse parenting behaviours in Australia and secondly to establish how these behaviours influence the development of adolescent substance use. Current evidence suggests that as a part of their acculturation challenge, culturally diverse parents are aware of the need for their children to resist unhealthy aspects of Australian culture such as adolescent alcohol and drug use (Rowland et al., 2003). In US studies culturally diverse parents explain their use of authoritarian and controlling parenting as an effort to protect their adolescent’s from substance misuse by controlling their social interactions and by allowing access to only selected peers and role models (e.g., family, close friends) (Md-Yunus, 2006).
There have been limited studies examining how culturally diverse parent behaviours influence their children’s substance use. Previous studies have shown that in culturally diverse families in the US parental monitoring reduced the likelihood of substance use among adolescents by decreasing the selection of friends who were using alcohol or drugs (Marsiglia et al., 2012).

US national school studies have consistently found that students from African American backgrounds have lower rates of alcohol, tobacco or illicit drug use than those from Hispanic, White or Caucasian backgrounds (Johnson et al, 2012). This finding has been related to African American parents having stricter and clearer attitudes prohibiting youth alcohol and cigarette use than White parents and a stronger belief that it was their responsibility to protect their adolescents from smoking (Sokol-Katz & Dunham, 1997).

In summary the above studies reveal that, Asian-American and African-American parents may differ to Euro-American parents in focussing on traditional parenting that is more authoritarian and that emphasises the hierarchical control of adults. To what extent do these findings have relevance to cultural diversity in Australia? It is likely that in Australia parental norms are likely to reflect those in the US in emphasising adolescents having autonomy and individual decision making (Rowland et al., 2003). In traditional cultures there are likely to be less tolerance of deviance and non-conformity. This may raise issues in the Australian culture where the place of women has changed considerably in recent decades. It is possible that traditional cultures may be reluctant to accept these changes in gender roles. The changing place of women has been associated with increasing rates of family breakdown indicated by separation and divorce. These changes may be more difficult and less accepted in traditional cultures. In some cultures there may be sanctions that prevent seeking assistance for children experiencing
problems in areas such as conduct disorder and school difficulties. Parenting and family interventions are available in Australia, but it is unclear to what extent they are taken up and found useful in culturally diverse families (Toumbourou et al, 2014).

The available research summarised above reveals that there is evidence that non-Australian cultural background may protect against adolescent substance use and this effect may be related to different patterns and influences of parenting in different cultures. To date there has been little systematic comparison of parenting behaviours in different cultures. The first aim of the present project was to identify cultural differences in parenting behaviour and alcohol and drug use on two commonly used indicators of culture that are used in Australia: language spoken at home and child’s country of birth. Given that previous research has not revealed specific directions, the hypothesis was that parenting behaviour’s would be reported to be different for Australian children from a non-English home language and who were born outside Australia. The second aim of the present project was to identify whether language spoken at home and child’s country of birth were longitudinal predictors of adolescent alcohol and cannabis use. Based on prior research, the hypothesis was that these factors would predict lower rates of alcohol and drug use.

7.2 Methods

The “Resilient Families Research Initiative” (RFRI) is a prospective cluster randomised controlled trial evaluating the effectiveness of the “Resilient Families” program (Australian Clinical Trial Registry Number: 012606000399594). The “Resilient Families” program is an early secondary school intervention program (from Years 7 through to 9) designed to develop family support networks and reduce early adolescent experience of health and social problems.
Chapter Seven: Ethnicity, Parenting Style and Substance Use (Empirical Study Three)

The “Resilient Families” program comprised: (1) a school-based student curriculum designed to promote adolescent resilience and healthy family relationships; (2) parent education evenings delivered using the “Parenting Adolescents Quiz” (PAQ) and designed to assist parents in promoting healthy adolescent development (Toumbourou et al., 1999); (3) sequenced parent education groups delivered over eight-weeks using the “Parenting Adolescents: A Creative Experience” (PACE) program (Jenkin & Bretherton, 1994), and; (4) a handbook for parents and carers designed to further assist parents in supporting their adolescent child (Jenkin & Toumbourou, 2005). Shortt and colleagues have detailed the RFRI components (Shortt et al., 2006).

7.2.1 Measures

The questionnaires covered a range of factors including items relevant to individual behaviours and attitudes, country of birth, language they speak at home, social development influences in community, family, peer and school domains. A more detailed account of the measures can be found in Shortt et al. (2007). In what follows specific details are provided relevant to the items and scales used in the present analyses. Unless stated otherwise the scales used in the present analyses were sourced from the “Communities That Care” (CTC) youth survey (Arthur et al., 2002; Glaser et al., 2002) and responses were recorded using the following 4-point scale: 1 “Yes!”, 2 “yes”, 3 “no” and 4 “No!”. Scale scores consisted of the average across the included items.

7.2.1.1 Parenting style groups

Parenting style groups were identified using “Latent Class Analysis” (LCA) to model responses to the 17 items (described below) referencing parental demandingness and nurturance.
Parental demandingness was assessed using the CTC family management scale which is a well-validated measure incorporating items relevant to family rules and monitoring. The scale consists of the following six items: “Would your parents know if you did not come home on time; The rules in my family are clear; My family has clear rules about alcohol and drug use; My parents ask if I’ve finished my homework; When I am not home, one of my parents knows where I am and who I am with; My parents want me to call if I’m going to be late home” (Cronbach’s Alpha = 0.72).

Parental nurturance was measured with adolescent reports on four CTC scales assessing parental closeness and communication. Family opportunities consisted of the following three items: “If I had a personal problem, I could ask my mum or dad for help; My parents give me lots of chances to do fun things with them; My parents ask me what I think before most family decisions affecting me are made” (Alpha = 0.75). Family Rewards, two items: “My parents notice when I am doing a good job and let me know about it; How often do your parents tell you they’re proud of you for something you’ve done”. Response options were: All the time 4 “All the time”, 3 “Often”, 2 “Sometimes” and 1 “Never or Almost Never”. (Alpha = 0.67). Attachment to Mother, three items: “Do you feel very close to your mother; Do you share your thoughts and feelings with your mother; Do you enjoy spending time with your mother” (Alpha = 0.78). Attachment to Father based on the same three items with the referent changed to “Father” (Alpha = 0.83, coded such that higher scores reflect attachment).

7.2.1.2 Ethnicity

Participants’ ethnicity was measured by identifying the following factors:
Country of birth: “In which country were you born?” Response options: Australia; Another country (Please specify); 

Parent’s country of birth: “In which country was your mother born?” and “In which country was your father born?” Response options: Australia; Another country (Please specify) 

Language spoken at home: “What language do you speak at home?” Response options: English; Another language (Please specify); English and another language (Please specify)

7.2.1.3 Wave 1 Predictor Variables

Antisocial behaviour was assessed based on nine items. Four items from the CTC survey asked about past behaviour: Stolen something; Physically attacked someone; Carried a weapon; Been arrested. Response options were: 0 “Never”; 1 “Yes, but not in the last year”, 2 “Yes, in the last year”. Five items were from the “Strengths and Difficulties Questionnaire” (SDQ) (Goodman, 2001): I get very angry and often lose my temper; I usually do as I am told (reverse-scored); I fight with others; I am accused of lying or cheating; I take things that are not mine. Response options: 0 “Never”, 1 “Somewhat True”, 2 “Certainly True” (Alpha 9-items = 0.73). 

Academic failure was assessed by one item asking: “Putting them all together, what were your marks like last year?” Response options: 1 “Very Good”, 2 “Good”, 3 “Average”, 4 “Poor”, 5 “Very Poor”.

Demographics factors were assessed based on student responses to questions on: Gender; “Are you or your family Aboriginal or Torres Strait Islander?” No, Yes, Parental marital status: “Are your parents…?” Response options: Living together; Separated or divorced; Have never lived together; One or both of my parents have died; Something else (please describe)
Alcohol use, cigarette use and cannabis use were also measured by asking participants: Have you ever had more than just a sip or two of an alcoholic beverage (like beer, wine or liquor/spirits)?; Have you ever smoked cigarettes?; Have you ever used marijuana? Responses were categorized into two groups: substance users (lifetime) and non-users.

7.2.2 Participants and procedure

Out of 39 Government and Catholic secondary schools approached in Melbourne (62% participation rate) 24 of them participated in the “Resilient Family” study. In 2004, Year 7 students and their parents/carers were invited to enter a longitudinal study and complete a survey annually. Surveys and consent forms were mailed out to parents and 85% of families returned the consent forms; of these 53% of parents gave consent for their adolescent (n = 2,356) to take part in the study. At the time of sample recruitment, the study description and consent forms were sent to parents in English and 4 different non-English languages.

For the current study, the total eligible survey population across the 24 schools consisted of students in the first year of secondary school in 2004 (Year 7, mean age = 12.3 years, SD = .50, n = 4,404). Only eligible students whose parents returned signed consent forms were approached at the baseline survey (n = 2,356, 53% of the eligible sample). Students provided their consent to participate on the day of the survey. Adolescents were resurveyed after 2-years (Year 9 mean age = 14.5 years, SD = .50). The present analysis is based on 2,081 students (47% of the eligible sample, 88% of the consenting sample) whose parents provided signed consent and who responded to all relevant items at the two surveys. Attrition was due to participants leaving the school, absenteeism, refusal to continue participation or surveys judged to be invalid.
Adolescents responded to the paper questionnaires during a standard classroom period under the supervision of research staff. Students were no longer in their original schools were followed-up and surveyed in their new school location.

7.3 Analysis

For the latent class models, preparation of items was done using STATA version 12 (StataCorp, 2011). All LCA models were fit using SAS® version 9.2 for Windows3 (Lanza et al., 2010). LCA was used in identifying the parenting style groups from the responses to the 17 items assessing parental demandingness and nurturance. LCA models sought to identify whether item responses shared associations through a small number of discrete latent classes. Models were compared with different numbers of classes with model selection based on (1) minimising “Akaike Information Criterion” (AIC) and “Bayesian Information Criterion” (BIC) and (2) the reliability of the model convergence across 1,000 trials.

Statistical analysis including Chi-square for percentages, t-tests for mean differences in country of birth and ANOVA for mean differences in home language were conducted. As well as multinominal regression analyses that were performed (using STATA software) to predict alcohol and cannabis use at Wave 3 from country of birth, parenting style and other factors at Wave 1. The final model is adjusted for all predictors at Wave 1 and for the classroom clustering of students at Wave 1.
Chapter Seven: Ethnicity, Parenting Style and Substance Use (Empirical Study Three)

7.4 Results

7.4.1 Associations with country of birth and home language

Table 7.1 presents associations with country of birth and non-English home language. The findings show that there were significant differences between those reporting different Australian birth and home language contexts. In Wave 1 rates of alcohol use were significantly lower for those reporting non-Australian birth or a home language other than English, but there were no significant differences for cannabis use. There were no significant differences for parenting style but there were differences for each of the specific parent measures except family management and father attachment. Mother attachment, family rewards and family opportunities were generally higher for those reporting an Australian birth or English home language. In Wave 3 rates of alcohol use were significantly lower for those reporting a home language other than English and both alcohol and cannabis use was lower for those reporting a non-Australian birth.
Table 7.1

Wave 1 country of birth and home language associations with parenting and alcohol and cannabis use variables

<table>
<thead>
<tr>
<th>Australian birth</th>
<th>Language spoken at home</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes n = 1,885</td>
<td>No n = 196</td>
</tr>
<tr>
<td>Alcohol Use</td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Yes (English)</td>
<td>%</td>
</tr>
<tr>
<td>33.63</td>
<td>23.47</td>
</tr>
<tr>
<td>**</td>
<td>34.35</td>
</tr>
<tr>
<td>21.92</td>
<td></td>
</tr>
<tr>
<td>30.13</td>
<td>*</td>
</tr>
<tr>
<td>Cannabis Use</td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Yes (Other)</td>
<td>%</td>
</tr>
<tr>
<td>0.90</td>
<td>0.51</td>
</tr>
<tr>
<td>ns</td>
<td>0.93</td>
</tr>
<tr>
<td>1.37</td>
<td>0.66</td>
</tr>
<tr>
<td>p</td>
<td></td>
</tr>
<tr>
<td>Family Rewards</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>3.14</td>
<td>0.80</td>
</tr>
<tr>
<td>3.02</td>
<td>0.85</td>
</tr>
<tr>
<td>ns</td>
<td>3.18</td>
</tr>
<tr>
<td>3.18</td>
<td>0.78</td>
</tr>
<tr>
<td>2.95</td>
<td>0.81</td>
</tr>
<tr>
<td>3.03</td>
<td>0.84</td>
</tr>
<tr>
<td>**</td>
<td></td>
</tr>
<tr>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Mother Attachment</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>3.43</td>
<td>0.61</td>
</tr>
<tr>
<td>3.34</td>
<td>0.61</td>
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<tr>
<td>*</td>
<td>3.45</td>
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<td>3.41</td>
<td>0.53</td>
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<tr>
<td>3.35</td>
<td>0.64</td>
</tr>
<tr>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Family Opportunities</td>
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</tr>
<tr>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>3.17</td>
<td>0.77</td>
</tr>
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<td>0.75</td>
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<tr>
<td>ns</td>
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</tr>
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<td>3.19</td>
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<td>3.12</td>
<td>0.78</td>
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<td>ns</td>
<td></td>
</tr>
<tr>
<td>Family Management</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>SD</td>
</tr>
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<td>0.68</td>
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<tr>
<td>3.28</td>
<td>0.66</td>
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<tr>
<td>3.19</td>
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<tr>
<td>3.15</td>
<td>0.73</td>
</tr>
<tr>
<td>***</td>
<td></td>
</tr>
<tr>
<td>ns</td>
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<tr>
<td>n = 1,403</td>
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<tr>
<td>p</td>
<td></td>
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<td>Other Language</td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Yes (English)</td>
<td>%</td>
</tr>
<tr>
<td>58.73</td>
<td>61.64</td>
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<td>19.18</td>
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<td>25.17</td>
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<td>11.59</td>
<td>*</td>
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<td>English and Other</td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Yes (Other)</td>
<td>%</td>
</tr>
<tr>
<td>8.49</td>
<td>9.69</td>
</tr>
<tr>
<td>ns</td>
<td>7.27</td>
</tr>
<tr>
<td>9.59</td>
<td></td>
</tr>
<tr>
<td>11.59</td>
<td>*</td>
</tr>
<tr>
<td>N = 604</td>
<td></td>
</tr>
<tr>
<td>p</td>
<td></td>
</tr>
<tr>
<td>**</td>
<td></td>
</tr>
</tbody>
</table>

Note. Statistical tests are based on Chi-square for percentages, t-tests for mean differences in country of birth and ANOVA for mean differences in home language. * p < 0.05; ** p < 0.01; *** p < 0.001; ns = non-significant difference.

Tables 7.2 presents the multinominal regression findings predicting Wave 3 (W3) alcohol and cannabis use from country of birth, parenting style and other factors at Wave 1. The model is adjusted for all predictors at Wave 1 and for the classroom clustering of students at Wave 1 (W1).
The results in Table 7.2 showed no significant effect for parenting style or the specific parent behaviour scales as longitudinal predictors of alcohol or cannabis use; however poor family management was a significant risk factor for both. The relative risk ratios revealed that
each one unit increase in poor family management increased the risk of Wave 3 (W3) alcohol use by 44% (95% Confidence Interval [CI] 5 – 96%) and cannabis use by 137% (CI 52 – 268%), after adjusting for other influences. Those who spoke a non-English language at home and those who spoke English and another language at home were found to be significantly less likely to use alcohol in W3; whereas non-Australian birth was a significant factor in reducing cannabis use as well as speaking English and another language at home.

Having experienced alcohol use in W1 increased the likelihood of using alcohol in W3 by above a factor of three. The findings also showed that W1 antisocial behaviour contributed to W3 alcohol use. It was found that alcohol or cigarette use or antisocial behaviour in W1 increased the risk of cannabis in W3, after adjusting for other factors.

There were only two interactions with non-Australian birth retained in the final model. Parental separation or divorce showed a larger risk effect for W3 cannabis use for those reporting a non-Australian birth, although this was not significant after adjusting for other factors. Wave 1 antisocial behaviour showed a significantly larger risk effect for W3 cannabis use for those reporting a non-Australian birth.

### 7.5 Discussion

The current study was the first conducted in Australia, and one of few internationally, that has looked at differences in the Baumrind parenting styles and parenting behaviours within an adolescent population from families with culturally diverse backgrounds. The result showed that the hypotheses were both partially supported. The first hypothesis was that parenting behaviours would be reported to be different for Australian children from a non-English home
language and who were born outside Australia. The study found some support for this hypothesis. For those children reporting a non-English home language, there were fewer reports of family rewards, mother attachment, family opportunities, however, there were fewer differences based on place of birth.

The second hypothesis proposed that language spoken at home and children’s country of birth would be longitudinal predictors of lower levels of adolescent alcohol and drug use. The study found that adolescents who spoke a non-English language at home were more protected against alcohol and cannabis use, while non-Australian place of birth was protective for cannabis use.

In line with a number of other studies, the present study found that indicators of cultural diversity were associated with lower levels of adolescent alcohol and drug use. In overview non-English language was a more important protective factor than non-Australian birth in the present study. The protective effect of non-English language may be understood if we assume that non-English language is an indicator of families maintaining traditional parenting practices and resisting acculturation. The families that maintained their non-English language may be showing more reluctance to acculturate (Farver et al., 2007).

The present study found some support for the first hypothesis in that children from non-English language background reported lower nurturance (i.e., lower family rewards, attachment and opportunities), compared to children from English language background. However, the present study found no differences in family management for children from different English language background. These findings are in line with a number of studies that have reported culturally diverse families to be more authoritarian. For example, Weis and Toolies (2008) found African American and Latino mothers were less warm than European American mothers while
family management (demandingness) was similar. Deutsch et al. (2012) reported that African American is more authoritarian compare to European American.

In general, the present study found that non English language had a more significant effect than place of birth in showing differences in parenting behaviours. This finding is in line with the view that children from non-English language families are less acculturated to Australian norms. Hill (2006) found that in Mexican American families the less acculturated they were the greater the use of harsh and inconsistent discipline they reported.

The current finding support the finding of Rowland et al. (2003) that reported that young people from non-English-speaking backgrounds or with birth outside Australia were less likely to use illicit drugs. In the current study there were consistent differences in alcohol use for both English language and country of birth, however cannabis use showed differences only in wave 3 for country of birth. The failure to find differences in cannabis use may have been due to relatively low rates of this behaviour in the present study.

7.6 Limitations

Although the current study is longitudinal it is not possible to identify a causal effect of country of birth and English language background because these factors cannot be randomly assigned. Given that it is not possible to randomly assign these factors the current study provides a valuable observation of the effects of these factors on family environment and adolescent substance use over time.

Potential limitations of the current study was that only a limited number of factors were investigated and all data related to adolescent self-report. There were many unmeasured factors
in the present study that may need to be covered in future studies. For example future studies could look at a wider range of community factors, extended family, availability of drug and alcohol, religion, and peer influences. The present study relied entirely on adolescent self-report. Future studies could benefit from parent report of parenting and adolescents behaviour.

A weakness of the current study was that it included only a limited sample of culturally diverse families. The present sample did not represent the full culturally diverse background of Australian families. The relatively small sample of urban families did not permit the present study to look for differences by different types of home country or home language.

7.7 Conclusion

The present study found that non Australian birth and non-English home language at Year 7 were found to uniquely predict lower rates of alcohol and cannabis use in Year 9. The present study found that non Australian birth and non-English home language at Year 7 were associated with difference in parenting behaviours. However, these differences did not completely explain the effect of non-Australian birth and non-English language as predictors of alcohol and cannabis use in Year 9. Parenting behaviours were found to have similar longitudinal effects on adolescent alcohol and cannabis use regardless of culture.
Chapter Eight - Integrated Discussion

8.1 Project overview and key integrated findings

This chapter provides an integrated overview of the current thesis including the systematic literature review and the main findings of the three longitudinal studies. Each of the four studies was the first of their kind and there had been no similar studies conducted in Australia. In the section that follows the findings of the systematic literature review will firstly be revisited to discuss the implications for the empirical studies. The three empirical studies have examined the empirical fit of latent constructs related to Diana Baumrind’s parenting styles within a large community sample of Australian adolescents and included an examination of effects for those from culturally diverse family backgrounds. The studies examined the longitudinal effect of these parenting styles, relative to parenting behaviours as potential risk factors for the development of alcohol and cannabis use in early adolescence. A unique feature of the present empirical studies was that continuous domains of specific parenting behaviours were controlled for in examining the potential effect of Baumrind’s categories of parenting style on the development of adolescent substance use. As will be discussed below, the findings have implications for the design and interpretation of longitudinal developmental research studies and for theories of: adolescent development; parenting; the targeting of substance use prevention; and the adjustment of culturally diverse families migrating to countries similar to Australia.
8.2 Implications of the systematic review

The systematic review completed for the present project identified 23 longitudinal behavioural studies that met inclusion criteria and had previously evaluated the relationship between parenting behaviour dimensions, identified within Diana Baumrind’s theory, and the development of adolescent substance use. Analysis of these studies revealed that parenting styles had not been reliably measured in many of the longitudinal studies published since Baumrind’s study. There were few studies that had specifically measured Baumrind’s categories of parenting styles (e.g., Adalbjarnardottir & Hafsteinsson, 2001; Shucksmith et al., 1997). Most studies had tended to analyse the underlying domains of parenting behaviour rather than the higher order categories of parenting styles. Except for one study (Ennett et al., 2001), all other included studies showed that one or both of Baumrind’s parenting behaviour domains significantly predicted the development of adolescent substance use behaviour. The parenting behaviour of “monitoring” (parent demands to be informed of adolescent behaviour) has been shown to consistently predict reductions in adolescent substance use, with 18 studies confirming this effect (Adalbjarnardottir & Hafsteinsson, 2001; Aquilino & Supple, 2001; Barnes et al., 2000; Chassin et al., 2005; Cohen et al., 1994; Dishion et al., 1999; Engels et al. 2005; Getz & Bray, 2005; Huh et al., 2006; Jackson et al., 1999; Kosterman et al., 2000; Latendresse et al., 2008; Nash et al., 2005; Shucksmith et al., 1997; Steinberg et al., 1994; Stice et al., 1998; Van der Zwaluw et al., 2008; Webb et al., 2002).

Although the systematic review reported in the present study was restricted to 23 studies, the available evidence suggests that Baumrind’s parenting dimensions can be potentially assessed through adolescent self-report and when assessed in this way, longitudinally predict the emergence of adolescent substance use. The results of the systematic review, suggest that adolescent reports of parenting behaviours may be a reliable measure to monitor the longitudinal
effect of parenting behaviour. As a method of integrating findings from the available longitudinal research, a family influences model was proposed (see chapter four, Figure 4.2). The family influences model suggested that there are both independent and interactive effects of parental nurturing and demanding behaviours on adolescent development. The model argued further that nurturance may be a necessary precondition for demanding behaviour to be effective in reducing adolescent problem behaviours such as alcohol and drug use.

A key conclusion of the findings of the systematic review was that none of the included studies had used available analytical modelling such as structural equation modelling or latent class modelling to evaluate the measurement ‘fit’ of the behavioural ratings of parenting domains to the higher-order construct of parenting style. Thus in the included reviewed studies, there was a lack of investigation to establish whether the higher-order parenting style categories may offer a predictive benefit, after controlling for the underlying parenting dimensions that the categories were derived from. In effect the thesis sought to examine whether Baumrind’s (1991) finding that parenting styles predict substance use may have been more parsimoniously explained in terms of the influence of one or more of the constituent parenting behaviours that contribute to the parenting style construct.

The introductory chapters (chapter two) identified theoretical frameworks that could assist understanding of the processes that explain how parenting behaviours influence the development of adolescent substance use. In chapter two human development and system theories were reviewed. The implications of the empirical studies reported in this PhD thesis for human development and system theories will be outlined in brief detail below and then elaborated in later sections.
The studies reported in this PhD thesis were compatible with human developmental theories in showing that the initiation of either alcohol use or cannabis use in early adolescence (Wave 1) predicted continuity in these behaviours two years later. In line with Jessor’s problem behaviour theory (1977) antisocial behaviour in the Wave 1 surveys were longitudinal predictors of cannabis use two years later (see chapter six). Jessor (1991) argued that this common observation of associations between problem behaviours was explained both through functional benefits and also through the adolescent’s effort to achieve what Erikson described as psychosocial identity (Santrock, 2008) amongst other social factors. More recent theorists have argued that the co-association and stability of adolescent problem behaviours can also be explained at a neurodevelopmental level to be influenced by alcohol and drug use altering the biological sequence of neurological development (Hermens et al., 2013).

As was mentioned above, the current findings from the empirical studies completed for this PhD confirmed the observation evident in prior developmental theories that adolescent behaviour problems tend to show stability over time (Catalano & Hawkins, 1996; Jessor, 1991). One of the main predictors in the present studies was alcohol and cannabis use in Wave 1. Some earlier studies have shown that early adolescent alcohol use is a major predictor for later use in adolescence (e.g., Jackson et al., 1999; Webb et al., 2002). One of the strengths of the current PhD studies was that the effects of early adolescent cannabis and alcohol use were controlled for in each of the regression findings. Parents might have less influence on the development of adolescent substance use once adolescents begin using cannabis and alcohol (Huh et al., 2005; Van Der Zwaluw et al., 2008).

The longitudinal effect of early adolescent substance use on later substance use was a small to medium effect in the current PhD studies. This suggests that adolescent behavioural
Chapter Eight: Integrated Discussion

choices and identity decisions are still somewhat flexible and open to change in early adolescence (Liebert, et al., 1986; Erikson, 1963). In the cases where adolescent substance use begins at an early age and is then maintained through adolescence, there are likely to be greater consequences in the biological embedding of potential problems in neurological development (e.g., Shonkoff, 2009; Westen, 2002).

Piaget’s cognitive development theory identified adolescence as a period where capacity for formal operational tasks increases. Prior to the empirical studies completed for this PhD there had been little research to establish whether early adolescents were able to develop coherent cognitive concepts of their parents’ behavioural styles. The findings revealed that early adolescent perceptions of parenting domains had high internal reliability. To represent the two key parenting dimensions of Baumrind’s parenting styles (i.e., parental demandingness and nurturance), 17 items were selected. Parental demandingness was assessed by the “Communities That Care” (CTC) youth survey low family management scale, which is a well-validated measure incorporating items relevant to family rules and monitoring (Cronbach’s Alpha ($\alpha$) = 0.72). Parental nurturance was measured using 11 items from four CTC scales: family opportunities ($\alpha$ = 0.75); attachment to mother ($\alpha$ = 0.78); attachment to father ($\alpha$ = 0.83); and family rewards ($\alpha$ = 0.67) (see chapter five for more details). The Latent Class Analyses revealed that early adolescent parenting perceptions appeared to be valid in that they were able to be grouped in ways that were consistent with Baumrind’s observations of parenting styles. The longitudinal prediction from adolescent parenting perceptions to the development of substance use behaviour appeared valid in according with theoretical expectations.

In line with observations from systems theory, the development of adolescent substance use behaviour was found to be predicted by both cultural, school and parent influences in the
adolescent’s social-cultural context. An important limitation of the analyses was that family socio-economic status was not directly controlled. However, a range of risk factors related to the effects of socio-economic status were measured and found to be associated with Wave 3 adolescent substance use. Poor family management (chapter 5, 6 & 7), home language other than English (chapter 6 & 7), and parental separation or divorce (particularly for those reporting a non-Australian birth) (chapter 7) were all found to independently increase the risk of adolescent substance use at Wave 3 (chapter 5, 6 & 7). These socio-cultural system influences appeared to act independently to early problem behaviours indicated by having experienced alcohol use in Wave 1 (chapter 5 & 6), early cigarette use, antisocial behaviour and externalising in early adolescence.

As mentioned above, antisocial (externalising) behaviour was found to be an independent risk factor for the development of alcohol and illicit drug use in adolescence, in accord with some prior research findings (Engels et al., 2005; Getz & Bray, 2005). Huh et al. (2005) observed that externalising behaviour influenced parenting behaviours, though they did not directly examine whether externalising behaviour predicted later alcohol use. Extending prior research findings, the present PhD results show that both child antisocial behaviour and parental monitoring were independent predictors of adolescent cannabis and alcohol use. These findings suggest that even in cases where adolescents exhibit antisocial behaviour, there may continue to be protective effects where parents can effectively monitor the child’s behaviour.

As is implied in the previous paragraph, the results of the studies conducted for this PhD thesis have implications for interpreting integrated developmental and social systems theories such as that presented in the “Social Development Model” (SDM; Catalano & Hawkins, 1996). The SDM argues that opportunities, rewards and skills influence parental bonding which is a critical proximal influence on the process of adolescent identification with parental attitudes and
behaviours. The findings reported in the PhD studies showed that after controlling for specific parenting behaviour domains and other factors, parental bonding (attachment) did not predict lower rates of adolescent alcohol or cannabis use. However, the results, when partially adjusted, indicated that bonding with parents was important in predicting adolescent alcohol and cannabis use. As the SDM suggests, in the late teenage years when adolescents spend less time with parents, parental bonding may no longer be a direct influence, but may continue to be an indirect influence through its impact on early behaviours. Parental bonding may set a foundation for the adolescent to accept parental standards and to engage in communication with parents, which are essential for parents to be able to monitor adolescent behaviours. The above interpretation of the PhD thesis findings is consistent with Barnes et al. (2000) finding that showed family bonding acted indirectly by mediating parental monitoring practices and those of Van Der Zwaluw et al., (2008) who found a direct effect of parenting nurturing, only in younger adolescents.

An important finding in the current PhD was that Baumrind’s categories of parenting style were not maintained as significant predictors of the development of adolescent substance use, after controlling for the direct effect of family management and other factors. There have been few prior studies that have tested whether the effects of parenting style are independent of the effects of underlying domains of parenting behaviour. A number of longitudinal studies have shown that there are similar relationships between parenting domains and adolescent substance use to those observed in this PhD. As distinct to the current PhD findings, Adalbjamardottir and Hafsteinsson (2001) found that authoritative parenting reduced substance use outcomes in adolescents. However, they did not control for the potential effect of specific parenting behaviours. In a number of studies factors related to demandingness have been shown to have direct effects in reducing adolescent substance use. Dishion et al. (1999) found that poor discipline significantly
predicted a higher onset of adolescent alcohol, tobacco and cannabis use. Proactive family
management and parental demandingness have also been shown to be effective in decreasing the
likelihood of adolescent substance use initiation (Kosterman et al., 2000; Steinberg et al., 1994).

An important contribution of the current PhD thesis was to provide information as to how
community cultural influences modify family system influences in the development of adolescent
alcohol and drug use behaviours. Amongst the cultural factors that were measured in the current
PhD studies were language spoken at home and country of birth. Evidence showed that the rates
of adolescent alcohol and drug use varied by country of birth and by home language. Some prior
studies have noted variation in rates of adolescent substance across countries in Europe compared
to the US (Hibell et al., 2007) and between culturally diverse groups within the US (Bronte-
Tinkew et al., 2006; Barnes et al., 2000). Cohen et al. (1994) found that in Asian adolescents there
were less disruptive behaviours and peer drug use was also reported at low levels relative to other
youth in the US. Prior to the present study there had been little research clarifying to what extent
this cultural variation could be attributed to differences in parenting style.

The findings of the current study showed that speaking a non-English language at home
had a more significant effect than place of birth in predicting differences in parenting behaviours.
This finding is consistent with Hill’s (2006) finding that showed children from non-English
language families were less acculturated to Australian norms. In the current study there were
consistent differences in alcohol use for both English language and country of birth, however
cannabis use only showed differences in Wave 3 for country of birth. The failure to find
differences in cannabis use at Wave 1 may have been due to relatively low rates of this behaviour
in the present study. The current results support the finding of Rowland et al. (2003) indicating
that it is less likely for young people from non-English-speaking backgrounds or born outside
Australia to use alcohol or illicit drugs.

In summary, the findings of the three studies presented in this PhD showed that adolescents could provide reliable observations of parenting behaviours and these behaviours were utilised in Latent Class Analyses to identify four parenting style groups that were comparable to the typologies described by Baumrind. The hypothesis that authoritative parenting would predict lower rates of alcohol and cannabis use in adolescents was not fully supported. Family management was found to be a more direct predictor than parenting style in accounting for the development of adolescent alcohol and cannabis use during early adolescence.

8.3 Baumrind’s parenting styles and child and adolescent development

In the sections that follow the implication of the PhD thesis for Baumrind’s theory of parenting styles will be examined in more detail. Results of the studies presented in this PhD indicated that parenting style was not a significant predictor for the development of adolescent alcohol and cannabis use, after adjusting for the direct effect of family management, parental nurturance and other predictors. The present findings suggest that the overall parenting style (i.e., the distinct balance of parental responsiveness and demandingness) may be less important than specific family management practices (i.e., setting clear rules and monitoring behaviour) in predicting adolescent alcohol and illicit drug use.

These findings of the PhD studies yielded important information relevant to differences in parenting practices and their influence on adolescent development in culturally diverse families. The study found that adolescents who spoke a non-English language at home were more protected
against alcohol and cannabis use, while place of birth was protective for cannabis use. Speaking a non-English language at home and non-Australian place of birth were both found to be associated with different levels on parent behaviour variables. Despite these differences parenting behaviour variables were found to have similar effects in predicting the development of adolescent substance use regardless of cultural indicators, suggesting their influence was more universal and less culturally specific. The implications of these findings are discussed in more detail in the next section.

Prior to the present studies there has been limited investigation of the potential for early adolescents to identify parenting style categories. The finding in these studies that all four parenting styles were modelled in “Latent Class Analysis” (LCA) from adolescent reports of parenting behaviours extended Chan and Koo’s (2010) results, and was supportive of all four parenting styles being identified from a larger contemporary sample. In the present analysis, many of the groups were characterised by divergence in evaluations of mother versus father attachments. These results may reflect the fact that fathers are absent in more households today as rates of family breakdown are higher relative to Baumrind’s context.

Contrary to the hypothesis based on Baumrind’s theory, parenting style was found to have no significant effect in predicting adolescent alcohol use after the direct effects of underlying parenting behaviours and other factors were adjusted. This result is consistent with Engels et al. (2005) finding that a significant interaction effect was not found between parental affection expression and strict control in predicting adolescent alcohol use. The present study demonstrated parental nurturance measures were predictive of adolescent alcohol use in the partially adjusted models, but not significant after adjusting for the effect of family management and other factors. This is consistent with the majority of studies that have examined the effect of both parenting
domains, and found that only parental monitoring was independently predictive of adolescent alcohol use (Aquilino & Supple, 2001; Barnes et al., 2000; Getz & Bray, 2005; Huh et al., 2006; Jackson et al., 1999; Webb et al., 2002). Some studies have found that parental warmth/nurture independently predicted adolescent alcohol use in analyses that controlled for family monitoring. Comparable studies differed from the present study in controlling for fewer factors. For instance, none of the variables controlled in the present study was controlled in Nash et al. (2005), Pires and Jenkins (2007) and Van Der Zwaluw et al. (2008). Brody and Ge (2001) and Brody et al. (2009) measured both parenting domains with a single variable. Latendresse et al. (2008) found the effect of parental warmth was less stable across time compared to parental monitoring, while fewer factors were adjusted than the present study.

In contrast with the majority of studies and the present findings, three prior studies found no effect for family management (Engels et al., 2005; Ennett et al., 2001; Kosterman et al., 2000). In the Ennett et al. (2001) study the measure of parental monitoring had a relatively low reliability (Cronbach’s alpha 0.50). Engels et al. (2005) found family functioning was the only familial variable that was significant in their adjusted analyses. It was likely that this variable captured aspects of the family environment that underlie family management. In Kosterman et al. (2000), family management was shown to be significant, but not after parental alcohol use was adjusted for. This is consistent with the SDM (Catalano & Hawkins, 1996) and is discussed further below.

The present findings in predicting adolescent alcohol use are in line with several studies (e.g., Aquilino & Supple, 2001). The finding that parental nurture domains were significant prior to full adjustment of other factors, but not after, may be consistent with Barnes et al.’s (2000) proposition that parental support is indirectly related to adolescent alcohol use through monitoring.
In common with previous studies (Adalbjarnardottir & Hafsteinsson, 2001; Dishion, 1999; Shucksmith et al., 1997), the present study found that in unadjusted analyses negligent parenting increased the likelihood of adolescent alcohol use relative to authoritative parenting. The present findings showed only a marginally significant difference between authoritative and permissive parenting styles as predictors of adolescent alcohol use (p = .055). However, Table 5.3 in chapter five suggested differences in Year 7 (Wave 1) rates of alcohol use between authoritative and permissive parenting styles, suggesting the effects of permissive parenting may have adversely influenced late childhood and early adolescent development. That a significant difference was not found in the present study for permissive parenting may also be due to the current sample size being slightly underpowered. The present finding that authoritative and authoritarian parenting predicted a similar longitudinal risk for the development of adolescent alcohol use was unexpected because it contradicted previous longitudinal studies (Adalbjarnardottir & Hafsteinsson, 2001; Shucksmith et al., 1997). It should be noted, however, that the present study was distinctive in controlling for Wave 1 alcohol use.

Baumrind (1985) suggested that during adolescence, the parent-child relationship is transformed from a parent-dominant relationship to a more reciprocal relationship. In line with this proposition it was assumed that a demanding but supportive family environment was more likely to encourage adolescent choices to avoid early adolescent substance use. The findings reported in this PhD provide information that can clarify this proposition. Parental attachment was found to predict adolescent substance use only in analyses that did not include multivariate controls for other influences. This finding is interpreted to suggest that at younger ages both nurture/support and demandingness (monitoring) may make independent contributions to reducing
adolescent substance use, but as adolescence progresses monitoring may be of more direct influence.

Baumrind (1991) argued that nurturing parental behaviour allowed the child and adolescent to develop competence and work through the formation of personal attitudes essential to healthy identity formation. Nurturance was considered to model good habits of communication and relationship skills and to encourage healthy conditions for emotional development. Demandingness on the other hand was argued by Baumrind (1991) to be influential in providing realistic demands that might influence the development of skills (Havighurst, 1972), and establish realistic ego boundaries (see Erikson’s identity and generativity stages) (Erikson, 1963). Realistic expectations and demands may provide consequential learning opportunities that in the presence of nurturance encourage the development of competence. The current PhD findings observed that while nurturance was protective in early adolescence, it was demandingness (family management) that most directly predicted reduced adolescent alcohol and cannabis use two-years later. While the above section suggests that the mechanisms by which demandingness influences adolescent substance use may include realistic ego boundaries and competence, future research could directly examine these mechanisms.

8.4 Prevention science and substance use prevention

The prevention science paradigm emerged as a framework for integrating knowledge from human development studies and longitudinal research and intervention research (Coie et al., 1993). Within the prevention science paradigm the present PhD contributed a multivariate analysis of longitudinal data to establish that parenting style was not maintained as a predictor of the development of adolescent substance use behaviours, after controlling for underlying parenting
behaviours. In the sections that follow the implications of the PhD thesis for prevention science are considered in more detail.

The present study found that adolescents could provide reliable (internally consistent) descriptions of parenting behaviours and these behaviours were utilised in Latent Class Analyses to identify four parenting style groups that were comparable to the typologies described by Baumrind. The hypothesis that authoritative parenting would predict lower rates of alcohol use in adolescents was not fully supported. Family management was found to be a more direct predictor than parenting style of adolescent alcohol and cannabis drug use during early adolescence. These findings have raised the need to critically evaluate the role of parenting style in prior research and to conduct further research using a wider range of measures, methods and theoretically guided approaches. Lastly, both empirical evidence and theory suggest that parenting-related interventions should target primary school age children and focus on family management constructs of setting rules and monitoring of early adolescents in order to achieve effective adolescent alcohol and drug use prevention.

Other variables were identified in this study to be predictors of cannabis use which were consistent with past research. In the current study early cigarette and alcohol use and externalizing were all found to independently increase the risk of adolescent cannabis use at Wave 3. Evidence from the present study suggests that in order to prevent adolescent cannabis use, family interventions such as “Resilient Families” may need to include strategies to recruit and effectively assist families with high-risk adolescents that use alcohol and tobacco and experience externalizing problems at the start of secondary school.

Prior to the present study there has been little effort to examine whether findings from the prevention science paradigm are relevant to special sub-populations such as ethnically diverse
minority populations. One of the hypotheses developed in the present PhD thesis was that children from a non-English home language would be less likely to use illicit drugs and alcohol. Similar to some other studies (Rowland et al., 2003; Johnson et al., 2012; Marsiglia et al., 2012), the finding of the present study showed that adolescents from a culturally diverse background were reporting lower levels of alcohol and cannabis use. In general, non-English language was found to be a more important protective factor than non-Australian birth in the present study. This protective effect of non-English language might have been a result of resistance against acculturation where families try to maintain traditional parenting practices (Farver et al., 2007) and avoid acculturating to the Australian norm involving high levels of adolescent substance use.

Another finding of the present study was that children from non-English language backgrounds reported lower nurturance (i.e., fewer family rewards, lower mother attachment and family opportunities), compared to children from English language background. However, there were no differences found in family management for children from different English language backgrounds. These findings were supported by a number of other studies that have confirmed culturally diverse families to be more authoritarian (Weis & Toolies, 2010; Deutsch, Crockett, Wolff & Russell, 2012).

Rowland et al. (2003) reported that young people from non-English speaking backgrounds or with birth outside Australia were less likely to use alcohol or illicit drugs, which supports the current study’s findings. In the current study there were consistent differences in alcohol use for both English language and country of birth, although cannabis use showed significant differences only in Wave 3 for country of birth, which might have been due to fairly low rates of this behaviour in early adolescence in the current study.
Another finding of the current study showed that parenting behaviours have similar longitudinal effects on adolescent alcohol and cannabis use regardless of culture. Results confirmed that non Australian birth and non-English home language at Year 7 were associated with different levels in parenting behaviours, however there were no interactions between parenting behaviours and cultural indicators in the prediction of adolescent alcohol and cannabis use in Year 9. These findings extend prevention science knowledge in suggesting that parenting behaviours such as family management may have similar longitudinal preventative effects in reducing the development of adolescent alcohol and cannabis use, regardless of cultural context.

8.5 Study strengths and limitations

One of the strengths of the present study was its longitudinal design and a large community sample. Nevertheless, there were a number of limitations. Although this study was longitudinal, the assessment of parenting effects on adolescent alcohol and cannabis use was based on a non-experimental design. As the predictor variables were not subject to manipulation through intervention, the study cannot strongly claim to have identified causal effects.

A further strength of the study was that it examined the longitudinal effect of differences by country of birth and English language background. The current study provided a valuable observation of the effects of these factors on family environment and adolescent substance use over time. However, these factors were assessed by adolescent self-report and it is possible that other sources such as parents could have been used to confirm these observations. As is discussed below, the current study was limited by including a relative small number of indicators of cultural variation within a restricted metropolitan sample.
Consideration of the current study strengths and limitations is facilitated by comparison to prior research. The literature review of the current thesis was limited to 23 longitudinal studies and revealed a lack of Australian and other non-US studies examining the effects of parenting on the development of adolescent substance use. Strength of the present study was that it extended Australian research. The present study examined both Australian born and culturally diverse Australian families to examine whether parenting and the effects on adolescent behaviour were different in variations of the Australian context.

An important strength of the current study was that Baumrind’s parenting style categories were directly modelled from adolescent reports and their longitudinal effect compared to dimensions of parenting behaviour. The main limitation of the prior studies included in the systematic review was that across the papers reviewed, parenting dimensions were measured in inconsistent ways and in a number of cases did not include both of the Baumrind parenting dimensions and their combination. For example, some of the studies just looked at monitoring and control while others considered only nurturance or support. Also, while a number of studies measured parenting styles by using Baumrind’s parenting dimensions; there were very few studies that had attempted to directly confirm the validity of the parenting categories put forward by Baumrind.

A potential limitation of the present study was that the classification of parenting style was based on adolescent reports of parenting, using a specific selection of items and a limited number of factors. Categorizing parenting style applying other methods (such as parent reports) and using a wider range of items may produce different results.

An important limitation of the present study was that there were many unmeasured factors in the multivariate analyses that may need to be covered in future studies such as: SES; the
influence of extended family members; community availability of drug and alcohol; religion; peer influences; and a wider range of community factors such as disorganisation. Some of the previous studies had found important variables predicting adolescent substance use such as parental alcohol use (Kosterman et al., 2000) which was not controlled in the present study. As a result, the present findings can be said to be limited by the limited range of predictor variables included.

Finally, the current study included only a limited sample of culturally diverse families which did not represent the full cultural diversity of Australian migrant families. The current study included a fairly small sample of migrant families from metropolitan Melbourne and was not representative of the range of culturally diverse family backgrounds across Australia.

8.6 Research and practice implications

Alcohol and drug use is predicted to remain a common adolescent problem in the future, so there is an important need for research to clarify modifiable domains that can be targeted in intervention and prevention strategies. In line with previous research, the findings of the present study confirm that early adolescent alcohol and drug use is an important predictor of later adolescent alcohol and illicit drug use. This finding reinforces the importance of health promotion programs that attempt to delay or prevent adolescent alcohol and drug use; programs such as the “Resilient Families” intervention which was associated with reduced levels of adolescent alcohol use. Although not reported here, the intervention was found to significantly reduce the amount and frequency of alcohol use (Toumbourou et al., 2013) by for example encouraging parents to set household rules in order to not supply or allow adolescent alcohol use (Cheng, 2009). The current findings emphasis that family management practices and effective monitoring practices are
important factors for parenting researchers to consider in their attempts to identify strategies to reduce adolescent alcohol and drug use.

The current findings suggest the need to continue investigating the effect of parenting style on adolescent alcohol use in large longitudinal samples. Although parenting style did not directly affect adolescent alcohol use during early secondary school, the results revealed that children in authoritative families had lower rates of alcohol use. This finding proposed that there may have been benefits in prevention in earlier developmental periods, suggesting it may be valuable to target family intervention/prevention research for alcohol and drug use in primary schools.

The present study examined mother and father attachment separately. Future research is also recommended to further explore details related to variation in mother and father parenting dimensions within families. For example, there has been little research examining whether parents implement the same or different parenting styles in relation to their different children. In addition, there is also a need to study whether different parents in the same family adopt different styles, and if so, whether this alters the impact on child adjustment.

8.7 Practical implications for school and family-based prevention

The existing longitudinal research supports the importance of the parenting dimensions identified by Baumrind. Although in the present study, parenting style was not found to predict adolescent cannabis use directly during early secondary school, adolescents in authoritative families maintained lower rates of cannabis use in Year 9 (Wave 3), compared to those in the other parenting style groups. It remains possible that the preventative benefits of authoritative
parenting styles, specifically family management and family attachment may become more apparent in later periods of adolescence where rates of cannabis use are known to further escalate. The parenting dimension of family management was found to play an important role in predicting reduced alcohol and cannabis drug use in early adolescence. As this finding confirms a range of prior research future parent intervention programs in the adolescent stage may be advised to emphasise building skills in this more parsimonious dimension of parenting rather than the more complex categories of parenting styles.

Empirical evidence and theories suggest that parenting-related interventions are beneficial in preventing adolescents from alcohol and drug use and these kinds of prevention program should start earlier in life. A prior study found the Resilient Families intervention was effective at reducing frequent and heavy alcohol use at Wave 3 (Toumbourou et al., 2013), with this effect mediated by intervention impacts in encouraging parents to set rules not to supply or allow adolescent alcohol use.

Programs such as “Resilient Families” could usefully target primary school age children and focus on developing family management skills such as setting clear rules and monitoring of early adolescent behaviour in order to potentially achieve further impacts in adolescent alcohol use prevention. The current findings suggest that in order to prevent adolescent cannabis use, the “Resilient Families” intervention would have needed to more effectively target parents with high risk adolescents that were using alcohol and tobacco and experiencing externalizing problems at the start of secondary school.

It was found in the present study that parents from different cultural backgrounds had different levels of parenting behaviours resulting in different proportions in different parenting style categories. Although levels were different on parenting behaviours, there were no interaction
effects in longitudinal analyses suggesting parenting may have similar effects on adolescent 
behaviour regardless of cultural background. Therefore, although people from a culturally diverse 
background may need to have some specific parenting education which is customised according to 
their language, values and belief systems, the current study suggests the behavioural emphasis on 
encouraging family management skills and on discouraging early age alcohol and drug use may be 
universal.

8.8 Chapter summary

This chapter provided an integrated overview of the current thesis including the systematic 
literature review and the main findings of the three longitudinal empirical studies. The findings of 
the systematic literature review were firstly revisited to examine their implications for the 
empirical studies. The three empirical studies each examined the fit of latent constructs related to 
Diana Baumrind’s parenting styles and parenting behaviours within a large community sample of 
Australian adolescents and included an examination of effects for those from culturally diverse 
family backgrounds. The present empirical studies identified that Baumrind’s categories of 
parenting style were no longer significant predictors of the development of adolescent substance 
use after controlling for continuous domains of specific parenting behaviours. The implications 
were discussed for the design and interpretation of longitudinal developmental research studies 
and for theories of adolescent development, parenting, the targeting of substance use prevention, 
and the adjustment of culturally diverse families that have migrated to Australia.


Survey: First results (cat. no. PHE 35). Canberra: AIHW (Drug Statistics Series No. 9).


in predominantly Mexican enclaves of the Southwest US. *Journal of Ethnicity in Substance Abuse*, 11(3), 226-241


References


References


