The influence of parents and siblings on children's and adolescents' attitudes and behaviours towards alcohol: A critical review of the literature

Report for

Drinkwise Australia

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Executive summary

The use of alcohol in Australian society is normalised and many young Australians live with or have been exposed to the misuse of alcohol by family members. There is substantial evidence that regulatory influences including price, access and marketing are key drivers of alcohol consumption by young people. It is against this broader context that this report provides a review and synthesis of research on the influence of parents and siblings on children's and adolescents' attitudes and behaviours towards alcohol. The review identifies the key areas in which parents and older siblings influence children's and adolescents' attitudes towards and use of alcohol and builds on previous Australian reviews in this area. The focus is on the influence of parents and siblings on children and adolescents in the general population. Particular high-risk subgroups such as families affected by foetal alcohol syndrome or those in which the misuse of alcohol by an adolescent has been identified, are beyond the scope of this review.

In Australia and overseas, there is little reliable information about the prevalence of alcohol use by children under the age of 12. However, it is clear that drinking habits in adolescence predict regular drinking in later life, and so the misuse of alcohol in adolescence is linked with increased risk of alcohol dependence and other social and health inequalities in adulthood. The Australian Guidelines to Reduce Health Risks from Drinking Alcohol (National Health and Medical Research Council (NHMRC), 2009) state that "for children and young people less than 18 years of age, not drinking alcohol is the safest option".

The influence of parents

Parents may under-estimate the extent of their influence on the drinking behaviour of their off-spring over the longer term. Both positive and negative influences seem to have long-range potential, so parents who drink, for example, are more likely to hold permissive attitudes about their off-spring drinking. Some parents seem to believe that if they themselves drink, they would be hypocritical if they attempted to delay/prevent their adolescent son/daughter's initiation into alcohol use. However, parents' drinking should not prevent parents from setting and enforcing alcohol-specific rules for their children, and these rules need to be reinforced over time, as the number and range of social settings to which young people are exposed increases.

The quality of the bi-directional parent-child relationship underpins all aspects of parenting, both generic parenting and that which is specific to alcohol use. Parental monitoring and support are important variables that have been linked to later initiation to alcohol and subsequent alcohol use. These in turn reflect the quality of the communication that exists between parents and their adolescent off-spring.

Parental use of alcohol is generally understood to influence children's and adolescents' use of alcohol through social learning processes. Young children's knowledge of and attitudes towards alcohol have been linked to parental alcohol use. Maternal drinking

patterns have been more closely linked with female children's and adolescents' alcohol use, but there is a need for more longitudinal evidence on this. While measures of parental knowledge in relation to alcohol use by children are useful, they are not necessarily linked to positive behaviours unless they are linked with wider social, environmental, legislative and economic changes aimed at reducing alcohol use by children and adolescents.

Almost half of Australian parents believe that they should teach their children to drink at home before they reach the age of 18, and this number is higher for older parents (45+) and those living in regional areas. It is therefore not surprising that children's consumption of alcohol in the family home is often sanctioned by parents. Parents are the most common source of alcohol supply to Australian adolescents and most of the 'sipping' of alcohol by young children occurs under parental supervision in the family context. The age and place of initiation to alcohol use are linked. The earlier the age of initiation, the more likely it is to occur in the family home.

Reduction in supply of alcohol is an important strategy for prevention of initiation especially amongst preadolescents. Longitudinal studies have shown that child reports of parental supply of alcohol for their last episode of drinking are a strong predictor of increased alcohol use over time. Overseas research suggests that when parents do not supply alcohol, adolescents do not increase their consumption of other alcoholic drinks.

The influence of siblings

Much of the mutual influence that occurs between siblings in adolescence commences in the early childhood period. The strength and quality of sibling relationships exerts an influence that extends beyond childhood and adolescence, and into to adult life. While genetic factors do have an influence in the development of alcohol disorders amongst siblings, environmental factors can reduce the impact of high genetic risk. The impact of social/environmental influences appears to be greater than the influence of genetic factors for initiation to and use of alcohol, and these factors can also be reasonably targeted by public health interventions.

The evidence regarding the impact of the sibling relationship on adolescent alcohol use is inconsistent and there is limited generalisability of findings of studies with specific target study groups to the broader population. The majority of studies have been conducted overseas and because of cultural and policy differences the findings are not always applicable to the Australian setting. Cross-sectional studies have reported that siblings have an influence on adolescents' initiation to alcohol and that there are mutual influences in alcohol use between siblings of the same gender and of similar age. However, where it is available, longitudinal studies evidence suggests that sibling influence explains only a small part of the variance in sibling alcohol use over time, and that gender has no clear effect on sibling influence. It appears that common environmental factors explain most of the variance in drinking patterns amongst adolescent siblings.

Longitudinal research has found that siblings' patterns of drinking are influential in the selection of adolescents' drinking friends and this in turn has been linked with adolescents' drinking patterns. This association between siblings and the selection of friends may be an artefact of shared genes. In addition, siblings may influence the alcohol use of their younger brother or sister through their influence on the adolescents' friends.

Adolescent alcohol use is not independent of parent/family influences and so some resemblance of alcohol use between siblings is not surprising. Parental norms on alcohol use are reflected in children's alcohol use and this may be mistaken for mutual influences of sibling norms. In a supportive and positive relationship, parental permissiveness, drinking habits and alcohol-specific rules have been identified as influencing adolescent norms about drinking. These factors would also be expected to influence siblings' alcohol use and create similarities in sibling norms towards and use of alcohol. While cross-sectional research indicates that the influence of siblings on younger children's attitudes towards and use of alcohol is stronger than that of parents, longitudinal studies indicate that this effect diminishes over time.

Methodological issues

There is no data on the patterns of drinking by older siblings living in Australian families. There continues to be a dearth of longitudinal data and an over-reliance on cross-sectional studies, mainly conducted in the United States. Most of the research in this area is correlational and so there cannot be any extrapolation to 'cause and effect' relationships. While there are some longitudinal studies that examine the influence of siblings, parents and friends simultaneously, the length of follow-up is relatively short (1-4 years) and there is a need to examine the bi-directional influence of siblings including the possible effects of moderating variables such as the quality of sibling relationships. Given that middle childhood and adolescence are times of rapid change, longitudinal studies, in the Australian setting, over longer follow-up periods are required. There is a need to review the evidence on the role of siblings in relation to adolescent alcohol use using systematic review methodology. This would provide a basis for further longitudinal research in this area.

There are several other methodological difficulties in examining the role of parents and siblings in children's and adolescents' attitudes and behaviour towards alcohol. There is a lack of clarity in the definition of initiation, and measures of alcohol use are not standardised. In addition, many of the measures of alcohol use are self-reported either by parents, target children/adolescents or rely on siblings' perception of alcohol use.

Conclusions and implications for practice

For adolescents, the most accurate indicator of future alcohol use is current alcohol consumption patterns. Current alcohol consumption, age and sex are better predictors of later-life regular drinking than are measures of social influence. That is, social influences

on future drinking patterns are mediated by current alcohol use. Community-based comprehensive interventions that focus on the social context may therefore be more effective than solely focusing on the drinking behaviour of parents and siblings.

Effective interventions directed at parents are likely to influence more than one adolescent. That is, parents may influence each of their children and have an influence on their children's friends. This in turn may alter the influence of peers and negative sibling modelling. Interventions that focus on the influencing role of parents are likely to be more effective in reducing adolescent alcohol use than those which focus on siblings.

Many parents consider that their efforts to prevent/reduce their children's alcohol use have little influence against the broader social and environmental influences that contribute to alcohol use by children and adolescents. There is a need to support families, particularly parents, in their efforts to delay and reduce alcohol use by children and adolescents. Implementing multiple policies to reduce alcohol-related harm is more effective than relying on one strategy. Policy makers should consider economic, organisational and health education interventions that can contribute to supporting family members to change knowledge, attitudes, behaviour, policies and environments that are linked to alcohol-related harm amongst children and adolescents. These interventions should be consistent with the NHMRC guidelines that promote the delayed initiation to and supply of alcohol to minors.

1. Introduction

In recent years, there have been several Australian reports in relation to the role of families in alcohol use by adolescents. These include *Parenting influences on adolescent alcohol use* (Hayes, Smart, Toumbourou & Sanson, 2004), *The role of families in preventing alcohol-related harm* (Ward & Snow, 2008) and *Supporting the families of young people with problematic drug use* (Frye, Dawe, Harnett, Kowalenko, & Harlen, 2008). The extensive review by Hayes et al. (2004) and the review by Ward and Snow (2008) provide a context for examining the role of parents in influencing adolescent alcohol use. The review by Frye et al. (2008) provides an overview of the needs of family where substance misuse has been identified. Together, these three publications highlight the bi-directional influences that operate within families and provide the basis on which this review of parenting literature in relation to alcohol use by adolescents was conducted.

In comparison to the role of parents in relation to alcohol use by children, the role of siblings in relation to children's and adolescents' alcohol behaviour has received little attention. This review provides an updated knowledge base for understanding the role of parents in relation to the use of alcohol by children and provides a baseline description of the limited literature on the possible role of siblings in shaping adolescent alcohol use.

This review has been prepared for a wide audience including policy makers, researchers and practitioners. It is hoped that the publication of this report will stimulate the development and rigorous evaluation of further empirically-based prevention strategies , in order to address the misuse of alcohol by children and adolescents (and the consequent social, physical, and economic harms) in Australia.

2. Aim and scope of this review

The aim of this review is to document and critique the existing evidence concerning the role of parents' and older sibling's behaviours, attitudes and use of alcohol in influencing their children's/ siblings' attitudes, behaviour and use of alcohol, within the broader social environment.

The review authors recognise that strategies to restrict the marketing of and access to alcohol by young people are effective ways of reducing their misuse of alcohol (Smith & Foxcroft, 2009; Room, Babor & Rehm, 2005; McKee, Belcher & Hervey, 2009; Doran et al., 2008; Toumbourou et al., 2007). Family members are credible influences on children's and adolescents alcohol use and are often a point of access to alcohol for young people (Hayes et al., 2004). This report identifies the key areas in which parents and older siblings influence children's and adolescents' attitudes towards and use of alcohol and builds on previous reports by Hayes et al. (2004), Frye et al. (2008), and Ward and Snow (2008). The review by Frye et al. (2008) focuses on young people with identified problematic drug use and ways in which these families can be supported. The Hayes et al. (2004) report focussed on the general population with an emphasis on how the family influences patterns of drinking by young people.

This review focuses on the influence of parents and siblings on children and adolescents in the general population. Particular high-risk sub-groups such as families affected by foetal alcohol syndrome or those in which the misuse of alcohol by an adolescent has been identified, are beyond the scope of this review.

2.1 Influence of parents

There is a wealth of research on the role of parents in influencing the use of alcohol by adolescents. In particular, understandings of the influence of parents in the Australian setting have been enhanced by the report by Hayes et al. (2004). In order to avoid unnecessary duplication, this review builds on the findings of the Hayes et al. review by providing an update on evidence from international and national empirical research published since 2004. As a baseline, each section of this review summarises the findings reported by Hayes et al. and then provides the findings of research reported since that time, with additional commentary on identified aspects of the literature. The role of parents in influencing alcohol use by children has not been the focus of previous reports. However, there is considerable overlap in the studied populations in the literature that has previously been reviewed. While some studies have focused only on adolescents, others have included children, adolescents and young people. Where previous reviews have not included studies involving children and the influences are different to those of parents of adolescent children, this research was also reviewed. In some cases, this includes papers that were published prior to 2004.

2.2 Influence of siblings

The important role of parents in influencing alcohol use by children and adolescents has been clearly identified in numerous studies. However, the evidence regarding the role of siblings in this area is less substantial. There is no comprehensive review of the role of siblings upon which this review builds. As a result, there were no restrictions on the timeframe of the research considered in this section.

2.3 Review questions

As identified in the Tender document, the specific review questions were:

- What social and cultural role does alcohol play in the Australian family household unit?
- What are the attitudes and behaviours of parents and older siblings towards alcohol regarding its use and non-use in the presence of their children/younger siblings (whether this be at home or elsewhere)?
- Do parents and older siblings perceive themselves as having any influence in the shaping of their children's/younger sibling's attitudes and behaviours towards alcohol?
- Do parents and older siblings 'glorify' their own or others intoxicated or drunken behaviour in the presence of their children/younger siblings?
- Do parents and older siblings perceive an 'authoritarian approach' with alcohol at an early age may influence their child's/younger siblings' adolescent alcohol consumption patterns?
- What are the relevant sociological theories which explain attitudinal and behavioural adaptation in childhood and adolescence?
- What is the evidence that primary and secondary socialisation theories determine child outcomes, particularly adverse alcohol abuse and misuse?
- What national and international longitudinal studies have collected data on the current research topic and what are their findings?
- At what age/s do older siblings have the most influence on young children?
- At what age/s are younger children most influenced in relation to older sibling's attitudes and use of alcohol?
- What is the prevalence and drinking patterns in Australia of parents/older siblings living with their children/younger siblings?

In addition, the research team was asked to provide:

- A comprehensive outline of the key variables that may be linked to existing longitudinal data.
- A detailed outline of existing longitudinal studies that may be relevant to subsequent Stages of the project.

Box 1: The research questions as identified in the research tender document

3. Literature review methodology

3.1 Search Strategy

3.1.1 Empirical research

Whilst broad-based search strategies have the highest recall (potential relevant records) (Flemming & Briggs, 2006) they also have the lowest precision (actual relevant records found) (Shaw et al., 2004). An initial broad-based search of the literature for this review identified more than 5,000 references. The vast amount of literature on this topic meant that the use of key words (single or multiple) alone would not be sufficient. Instead, more refined search operators were used.

A range of search operators was used to conduct three separate comprehensive and efficient searches. Specifically these searches were the influence of

1) Parents on adolescents (limited to post 2003 publications)
2) Parents on children (no time limits)
3) Siblings on adolescents (no time limits)

These searches included (but were not limited to) truncation (a single asterisk * was used to truncate 1-5 characters. A double asterisk ** was used for open-ended truncation), Boolean operators (OR, AND, NOT), wildcards, field searches and proximity searches. For example, the initial search strategies used truncation and Boolean operators as follows: Child* OR Infant* OR Teen* OR adoles* OR youth AND alcohol AND Parent* AND influences OR beliefs OR attitudes OR support OR control OR monitoring OR Practice* AND sibling* OR sister* OR brother* NOT alcoholism NOT animal. These search strategies built up the controlled vocabulary terms, text words, synonyms and related terms for each concept at a time, joining the terms within each concept.

A diverse list of databases was searched and Boolean operators were tailored to each search and database. Not all databases use the same thesaurus terms, so these differences were taken into account when searching particular databases. Because of the problems with the indexing of some research paradigms (e.g. qualitative), search strategies had to be over-inclusive so as not to miss potentially relevant papers (Shaw et al., 2004). Specialist expertise from a professional librarian was also accessed to ensure that the search of each database utilised the most efficient and appropriate use of search terms and operators. EndNote referencing software was used to enhance the efficiency of the screening process. EndNote filters were used for each search and database and the search function was used to enhance the secondary pruning of references.

In the detailed searches, using search operators, 26 medical, social science and policy journal databases were searched (See Box 2 for full list of databases). In addition, systematised searches of the internet and dissertation databases provided access to unpublished theses. When combined, the initial searches retrieved 5690 references. Of

these, 1436 were either duplicates or in a language other than English. The remaining 4254 were screened for relevant words within the title and these were then checked visually by two reviewers. As a result, 2992 references were excluded. The remaining 1262 references were then independently reviewed and screened by two researchers on the basis of the relevance of the research abstract and title. This resulted in 950 references being excluded. Full texts were retrieved for the remaining 312 relevant references.

Each retrieved paper was allocated a code that was recorded in the EndNote 'key word' field. This allowed the research team to quickly determine the number of papers screened and the number of papers included. Abstracts of screened articles were downloaded into EndNote and the PDFs of the retrieved articles were attached.

In addition to searches of peer-reviewed literature, a search of the grey literature was conducted. The framework provided by Calabria et al. (2008) was used to guide this component of the search.

3.1.1 a) List of Databases Searched

In April 2009, the following databases were searched:

Social Citation Index (SSCI)
Science Citation Index Expanded (SCI Expanded)
Web Citation Index (WCI)
ISI Proceedings (Including Social Sciences and Humanities Edition)
CAB Extracts
CINAHL
EMBASE
MEDLINE
Current Contents
Academic Research Library
Dissertations and Thesis (A&I)
Health and Medical Complete
Health Module
Social Sciences Journal
Humanities and Social Science Collection
Health Issues in Criminal Justice
Drug Database
Health and Society Database
Meditext
Family and Society Plus
Sociological Abstracts
Social Services Abstracts
PsycINFO
Cochrane Library
Australian Digital Library
Index to theses

Box 2: Listed of databases searched

3.1.1 b) Inclusion/exclusion criteria

A comprehensive literature search was undertaken to identify relevant reports and studies pertaining to the role of parents and siblings in children's and adolescents' alcohol use. The selection of papers was driven by inclusion and exclusion criteria that were deemed relevant to the topic. In order to target the papers to the key research questions, studies which investigated areas outside of the scope of this review were excluded. Excluded topics included: religiosity, alcoholism, illicit drug use, ethnic factors, adolescent sexuality and smoking. Exceptions were made where the primary focus was adolescent alcohol use and the secondary issue was an excluded topic.

Definitions

Following this literature review, it is recommended that longitudinal research will be conducted to clearly identify the links between parents, siblings and alcohol use by children and adolescents in the Australian setting. Therefore, it was important that some guiding definitions were used in the literature review. Where possible, the following recognised definitions and principles were used:

Children/adolescent/young people/youth

In this review, children are defined as 0-14 years, adolescent as 10-17 years, young people 12-24 years, and youth as 15-24 years. There are a number of different ways to define young people and children but where possible definitions are consistent with previous Australian reports (Australian Institute of Health and Welfare (AIHW), 2007).

In Australia, children are defined as boys and girls aged 0-14 years (AIHW, 2008). However, this age range overlaps with the age group defined as 'young people' (12-24 years) (AIHW, 2008). These definitions overlap in recognition of the fact that different life stages involve transition and that this differs between individuals and societies (Moon, Meyer, & Grau, 1999).

The World Health Organisation (WHO) defined youth as 15-24 years (WHO, 1999) and this is consistent with the internationally recognized definition of youth (Department of Economic and Social Affairs, 2005). The WHO defines adolescents as those aged between 10 and 19 years. In Australia and many other western countries, adolescents are able to legally purchase alcohol at the age of 18. Hence, the influence of parents at this age is significantly altered. For the purpose of this review, the age range of included adolescents was 10-17 years.

It should be noted that these definitions are not used consistently across research studies. Where researchers used age brackets or definitions different to those described here, the details are provided.

Parent

The term 'parent' was used to refer to both biological and non-biological parents and other significant carer(s) in a child/young person's life.

Sibling

The term 'sibling' was used to refer to both biological and non-biological sibling(s) in a child/young person's life.

3.1.2 Existing Longitudinal Studies

The prospective nature of longitudinal studies means that they are generally funded over time-frames that extend beyond short-term political cycles and 'one-off' funding opportunities. Consequently, in Australia, longitudinal health studies are most commonly funded by bodies such as the Commonwealth Department of Family and Community Services, The National Health and Medical Research Council (NHMRC) or the Australian Research Council (ARC).

A search of the Commonwealth Department of Family and Community Services, ARC and NHMRC funded longitudinal studies for the period 2000-2008 was conducted using the terms child* or parent* and/or alcohol. ARC grants were also searched by discipline including sociology, social work, public health and health services and psychology. A total of 59 studies were identified. Screening by title and abstract meant that 53 studies were excluded on the basis of relevance and duplication. Several studies were 'nested' longitudinal studies. Following contact with several Chief Investigators, it was identified that the remaining six studies were either completed, had finished data collection for the childhood phase and/or did not collect data about alcohol use by children. No studies were identified where alcohol use had been measured in early childhood.

3.2 Types of studies included

This review included any quantitative or qualitative empirical research that is relevant to the topic including, but not limited to, designs such as cross-sectional, longitudinal, quasi-experimental, randomised controlled trials, phenomenology, grounded theory, ethnography, action research and feminist research. Systematic reviews, narrative reviews and meta-analyses were also reviewed and included as a mechanism for securing further empirical evidence.

The review considered studies that included the following phenomena of interest; the experiences, attitudes, values, beliefs, parenting styles and practices of parents and siblings in relation to children's and adolescents' attitudes toward and use of alcohol.

3.3 Language of papers

It was beyond the scope of this review to translate papers from languages other than English. Consequently, the search was limited to English language papers and reports.

3.4 Timeframe of studies

For the literature on parental influences on adolescent alcohol use, the findings reported by Hayes et al. (2004) were used as a baseline. Consequently, only papers for alcohol-related studies from 2004 – March 2009 were included (subject to availability). However, for the literature on parental influences of alcohol on children and the influences of siblings on adolescents, no time restrictions were imposed.

3.5 Policy and cultural context

One of the difficulties in making international comparisons in relation to alcohol use is the differing policy and cultural environments in which policy is developed and research is conducted. For example, in Australia, the harm minimisation policy framework includes using a wide-range of strategies addressing supply reduction, demand reduction and harm reduction (Ministerial Council on Drug Strategy, 2006). This compares with the abstinence-based policies used in the United States. While there are examples of empirical research that use common outcome measures when comparing different populations (e.g., McMorris, Hemphill, Toumbourou, & Patton, 2007), most comparisons are made between studies within similar cultural contexts, and so caution should be exercised when interpreting these results.

3.6 Consideration of methodological quality

Interpreting and comparing research studies is often complicated by methodological issues. There are several specific methodological challenges in the area of family influences on children's and adolescents' alcohol use in terms of outcome measurements and study design. While each of the papers in this review underwent a process of critical appraisal, not one was excluded on the basis of methodological inadequacy. The limitations of research and the implications for interpreting the results are discussed in Section 9.

3.7 Evidence-based practice

There is an abundance of research on the role of parents and, to a lesser degree, siblings in influencing children's and adolescents' alcohol use but these are often cross-sectional or cohort studies of relatively short duration. In addition, evidence of effectiveness of interventions is often unclear. While there is Cochrane systematic review evaluating primary prevention strategies aimed at reducing alcohol misuse amongst young people (Foxcroft, Ireland, Lister-Sharp, Lowe, & Breen, 2003), there are no systematic reviews

that evaluate the role of parents and/or siblings in reducing or preventing adolescent alcohol use. As a result, there are gaps and inconsistencies in the research in relation to the role of the family and alcohol use by children and adolescents. These gaps are often filled by ideologically-driven approaches to controlling adolescent alcohol use, resulting in further obfuscation of possible links between the application of evidence and practical outcomes. Whilst they may appear logical (i.e., possessing good face validity), systematic review evidence suggests that some interventions have a negative effect and can actually contribute to the *increased* misuse of alcohol by young people (Ward & Snow, 2008). In the absence of definitive evidence, priorities for interventions need to be linked to a health promotion evidence-base concerned with reducing alcohol use amongst adolescents and children.

There is a plethora of programmes aimed at the prevention and/or reduction of alcohol use by children and adolescents. To date, most attempts to reduce risk-taking behaviour among young people have been through school-based educational programs, targeted primarily at increasing knowledge and skills (Coombes, Allen, & Foxcroft, 2006; Steinberg 2008). Well-designed evidence-based alcohol education programs have been shown to contribute to an incremental reduction in alcohol misuse and alcohol-related harm (McBride, 2003; McBride, Farringdon, Midford, Meuleners, & Phillips, 2004; Midford, 2007; Wood, Shakeshaft, Gilmour, & Sanson-Fisher, 2006) but it is clear that community interventions that are broader and that take into account the sociocultural context and opportunities for risky behaviour are more cost-effective (Foxcroft et al., 2003; Steinberg, 2008).

We know that, across a range of health issues, providing information alone to parents or young people is not enough. Evaluation studies, meta-analyses and Cochrane systematic reviews indicate that while knowledge gains can be achieved, these changes do not lead directly to behaviour change (Faggiano et al., 2005; Foxcroft et al., 2003; Hawthorne, Garrard, & Dunt, 1995; Tobler & Stratton, 1997). Effecting and sustaining attitudinal and behaviour change remains the challenge.

3.8 Translating research into practice

Drinking behaviours are influenced by a range of personal and social factors and decision-making processes. While people are encouraged to take personal responsibility for their drinking behaviours, there is clear evidence that these behaviours are influenced by organisational, environmental, cultural, and economic factors that are beyond the control of the individual (WHO, 2004).

3.8.1 Health Promotion

A health promotion framework is useful in determining the effectiveness of intervention strategies aimed at reducing alcohol-related harm. Howat et al. (2003) defined health promotion as:

> *…a combination of educational, organizational, economic and political actions designed with consumer participation, to enable individuals, groups and who communities to increase control over, and to improve health through changes in knowledge, attitudes, behaviour, policy, and social and environmental conditions* (Howat et al., 2003, p. 83).

In this review, the Health Promotion Framework developed by Howat, Sleet, Maycock, and Elder (2007) (Figure 1) is used for linking research evidence with policy and health practice. This Framework provides an approach to alcohol-related problems that demonstrates how economic, policy, organisational and health education interventions can contribute to supporting family members to change knowledge, attitudes, behaviour, policies and environments that are linked to alcohol-related harm amongst children and adolescents.

Despite the strong evidence-base, health promotion in relation to alcohol use has primarily focused on individual change, with population-based change being neglected (Roomet al., 2005). Workers such as Room et al argue that a broader health promotion approach is needed to utilise the wealth of existing evidence and to link the current research on the role of parents and siblings in reducing the misuse of alcohol by children and adolescents.

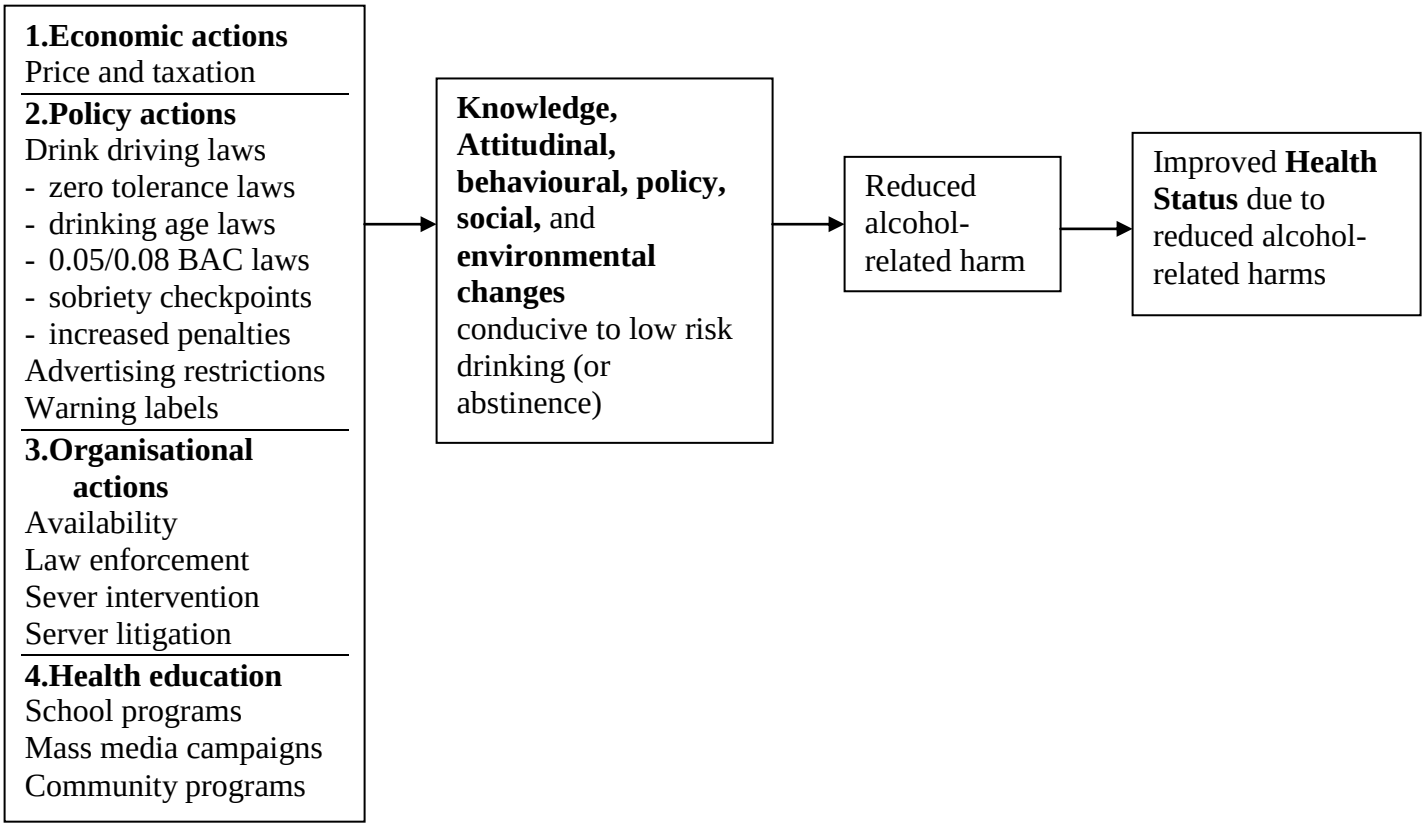

Figure 1: Health promotion framework for reducing alcohol-related harm (Howat et al., 2007)

Consistent with other areas of health behaviour, increased awareness of alcohol-related harm has generally been responded to with awareness raising activities (Cuijpers, 2003; Syme, 1998). Across several areas of health behaviour, including alcohol consumption, some strategies are very popular despite the fact that there is clear evidence that they are ineffective (Babor & Winstanley, 2008). For example, social marketing aimed at changing behaviour rarely, if ever, results in success (Cuijpers, 2003; Gauvin, 2003; Howat et al., 2007; Syme, 1998). However, it is recognised that social marketing may enhance the effects of broader-health promotion strategies (Cuijpers, 2003).

Increasingly, there is a focus on the role of the family in influencing children's and adolescents' alcohol use (Allen, Coombes, & Foxcroft, 2006). However, interventions aimed at families are not the universal solution (Allen et al., 2006). Attempts to reduce or prevent the use of alcohol by children and young people need to be viewed in the context of a health promotion framework like the one presented here.

4. Background

4.1 Social and cultural norms related to alcohol

Alcohol is considered to have a fundamental role in Australian life and is an accompaniment to many different kinds of social occasions. It is used to celebrate, commiserate and relax. Alcohol use amongst adults and young people is widespread in a number of western societies, and in Australia it is the most widely used recreational drug (AIHW, 2008). The use of alcohol in Australian society incorporates diverse meanings and patterns of consumption that are often described in terms of 'culture'; including 'drinking culture' and 'drunken culture' (Ministerial Council on Drug Strategy, 2006). For many young Australians, alcohol consumption is shaped by a 'culture' that is dominated by consumerism (Roche et al., 2007). In Australian households, the use of alcohol is influenced by a range of interanl and external factors that are not static . Rather it is dynamic and bi-directional, whereby young people and their families are continually influenced by their social environment, while shaping their own and others' drinking culture through their exchanges with others (Roche et al., 2007) . Inherent in this culture is the continued celebration of intoxication, which is regularly modelled by sporting 'heroes' and media celebrities (Measham, 2004; Measham & Brain, 2005).

In societies where intoxication in normalised, there are higher rates of high-risk drinking amongst adolescents (Peele, 2006). Alcohol misuse in Australian society is normalised and many young Australians live with or have been exposed to the misuse of alcohol by family members (Frye et al. 2008). These findings are consistent with findings from a recent survey where 70% of parents believe that alcohol is "a problem" in Australian society (Quantum Research, 2009). Therefore the role of parents and siblings in the prevention and minimisation of alcohol-related harm to children and adolescents needs to be interpreted through the broader context of "developing safer and healthy drinking cultures in Australia" (Ministerial Council on Drug Strategy, 2006).

4.2 Alcohol-related harm

Alcohol contributes to significant economic and social losses. In the year 2004-05, alcohol consumption in Australia accounted for $AUD15.3 billion (27%) of the social costs of drug abuse (Collins & Lapsley, 2008). It is estimated that in 2001, nearly 2,700,000 work days were lost due to workers' alcohol use, at a cost of $AUD 437 million (Pidd et al., 2006).

Alcohol is responsible for 3.2% of the total burden of disease and injury in Australia (Begg et al., 2007) but has also been reported as being responsible for the prevention of 0.9% per cent of the total burden of disease in 2003 (Begg et al., 2007). This is consistent with reports that low levels of alcohol consumption have been associated with some cardiovascular and cerebrovascular health benefits (Castelnuovo et al., 2006; Klatsky &

Udaltsova, 2007). However, alcohol consumption has no protective effect on cancer and recent studies have found that there is a link between alcohol use and breast cancer in women and that the cardiovascular benefits of alcohol use may have been overestimated (Danaei et al.,2005; Fillmore, Stockwell, Chikritzhs, Bostrom, & Kerr, 2007; Fuchs & Chambless, 2007).

The misuse of alcohol is predictive of later elevated alcohol consumption, alcohol dependence, health and social problems that are associated with individual, family and broader community harm (Bonomo, Bowes, Coffey, Carlin, & Patton, 2004; Viner & Taylor, 2007). The immediate effects of drinking alcohol include a lowering of inhibitions and impairment of gross motor, sensory and thought processes (NHMRC, 2009). Excessive alcohol consumption is associated with increased risk of accident and injury, and even death, while the cumulative effects of unsafe drinking patterns are risk factors for morbidity and mortality associated with cardiovascular disease, diabetes, cancer, obesity and mental health diseases (NHMRC, 2009; Drugs and Crime Prevention Committee, 2004; Ministerial Council on Drug Strategy, 2004).

Amongst young people under 18 years of age, the risk of alcohol related violence, injuries and self-harm is much higher than for the adult population (NHMRC, 2009). Rates of alcohol-related harm, as measured by alcohol-caused hospital admissions and presentations to emergency departments, amongst 16-24 year old Victorians have increased significantly over the last eight years (Livingston, 2008). Alcohol-caused emergency department presentations, for 16-17 year old females, have doubled in this period (Livingston, 2008). In 2007 self-reported alcohol use, from the National Drug Strategy Household Survey (NDSHS), by young Australians found that 26% of 14-19 year olds drank, at least once a month, at levels that placed them at risk or high risk of alcohol-related harm in the short term, while 8.8% drank at levels that placed them at risk or high risk of alcohol-related harm in the long term (AIHW, 2008).

4.2.1 Perceptions of alcohol related harm

The majority of Australians do not associate alcohol with the ‘drug problem’ (AIHW, 2008). This is despite the fact that 12% of the population report driving a vehicle and 6% report verbally abusing someone while under the influence of alcohol (AIHW, 2008). Similarly, many Australians do not perceive that their own patterns of alcohol consumption increase their short-term health-related risks. In 2004, 31% of men perceived that they could consume 5-6 standard drinks on a single occasion without increasing their health risk (AIHW, 2005). Similarly, 40% of women believed they could consume 3-4 standard drinks before increasing their risk of alcohol-related harm (AIHW, 2005). These findings are consistent with a recent national survey of Australian parents where 80% of respondents reported that they are still in control even when they have had a ‘lot’ to drink (Quantum Research, 2009). It is therefore not surprising that despite the dangers associated with alcohol use, many young people and their families remain relatively sanguine about the risks and harms associated with the regular misuse of alcohol (Graham, Ward, Munro, Snow, & Ellis, 2006; Ward & Snow, 2008).

4.3 Patterns of Alcohol Use in Australia

A substantial proportion of Australian adults report patterns of alcohol consumption that increase their lifetime risk of alcohol-related harm. The 2007 NDSHS is the most methodologically rigourous and up-to-date source of information on Australians' drinking habits. The survey found that 20% of Australians aged 14 years or older reported alcohol consumption patterns that were considered risky or high-risk for short term harm[1], on a weekly or monthly basis while 25% reported drinking patterns that were considered to be risky or high risk for harm in the long term[2] (AIHW, 2008).

4.3.1 Alcohol use by Australian parents

Many Australian children live in households where there is misuse of alcohol. Secondary analyses of the 2003 NDSHS, conducted by Dawe et al. (2006) found that 13% of children under 12 years of age were exposed to binge[3] drinking by adults within the household. Preliminary analysis data, from the Longitudinal Study of Australian Children (also conducted by Dawe et al.(2006) found that 10% of mothers and 25% of fathers (in couple relationships) of 4 year old children binge drink. Consistent with these findings, 15% of Indigenous children, aged 4-17 years, in Western Australia have been reported to be living in households where alcohol has been identified as a problem (Zubrick et al., 2005). In a recent survey of Australian parents, 50% of respondents reported consuming alcohol on a weekly basis (Quantum Research, 2009).

There is a dearth of standardised information on Australian parents' alcohol use. Comparisons of findings from differing sources are limited by the reporting of different measures of alcohol use and lack of data on parental status. While the terms 'risky' and 'high-risk' drinking are no longer used in Australian Guidelines (NHMRC, 2009), the findings of NDSHS indicate that a significant proportion of Australians (many of whom will be parents) are at risk of negative physical, emotional and social consequences associated with their own unsafe drinking practices.

4.3.2 Patterns of alcohol use by children and adolescents

In Australia and overseas, there is little reliable information about the prevalence of alcohol use in early childhood (Zucker, Donovan, Masten, Mattson, & Moss, 2008). In the United States, the majority of children under 12 years of age have tasted alcohol

[1] In 2007, short term harm was defined as follows: For males, the consumption of 7 or more drinks on anyone day. For females, the consumption of 5 or more standard drinks on any one day.

[2] In 2007, long term harm was defined as follows: For males, the consumption of up to 28 standard drinks per week = 'low risk', 29 to 42 drinks per week = 'risky' and 43 or more drinks per week = 'high risk' . For females, the consumption of up to 14 standard drinks per week = 'low risk', 15-28 drinks per week = 'risky' and 29 or more per week = 'high risk'.

[3] In 2003, binge drinking was defined as follows: For males: the consumption of 7 or more drinks on one occasion 2-3 times per month or more. For females, the consumption of 5 or more drinks on one occasion 2-3 times per month or more.

(Donovan, 2007) but in general, there are substantially more 'sippers' amongst young children than 'drinkers' and most 'sipping' is with parental approval in a family context (Donovan & Molina, 2008; Johnson, Greenland, Webber, & Berenson, 1997). Most of the studies on alcohol use amongst children exclude the early childhood years and it is difficult to extrapolate the findings of studies of school students to early childhood. In New Zealand, longitudinal analysis has shown a small positive correlation between children who have been introduced to alcohol prior to the age of six and 'heavy' drinking at age 15 (Fergusson, Lynskey, & Horwood, 1994). However, these data were collected via adolescent self-reports and there were no details reported about the social context of alcohol initiation in early childhood.

Drinking habits in adolescence predict regular drinking in later life and so the misuse of alcohol in adolescence is linked with increased risk of alcohol dependence and other social and health inequalities in adulthood (Bonomo et al., 2004; Viner & Taylor, 2007). Children who have commenced drinking regular serves of alcohol by the age of twelve are more likely to develop patterns of early binge drinking, alcohol problems and social problems in adulthood (Englund, Egeland, Oliva, & Collins, 2008; Poelen, Engels, Vorst, Scholte, & Vermulst, 2007a; Warner & White, 2003). In addition, the number of episodes of intoxication and the age at which they occur increase the risk of alcohol misuse in adulthood (Clapper, Buka, Goldfield, Lipsitt, & Tsuang, 1995; Warner & White, 2003). Adolescents who consume alcohol within the recommended limits are less likely to report alcohol-related harms at age 21 (Poelen, Scholte, Willemsen, Boomsma, & Engels, 2007b; Toumbourou et al., 2004).

Regular drinkers are more likely to drink at unsafe levels. Reports from the NDSHS indicate that 21% of young people aged 14-19 report consuming alcohol on a weekly basis (AIHW, 2008). Of these, 26.3% report drinking at risky or high-risk levels for short-term harm at least weekly or monthly while 8.8% report consuming alcohol at risky or high-risk levels that put them at risk for long-term harm (AIHW 2008).

The daily and weekly rate of alcohol consumption increases with age. Less than 1% of 12-15 year olds consume alcohol on a daily basis, but this increases to 1.6% of 18-19 year olds (AIHW, 2008). Similarly, 2.1% of 12-15 year olds report consuming alcohol weekly but this increases to 41.1% of 18-19 year olds. Amongst 12-15 year olds, females are more likely to consume alcohol daily and weekly. However males aged 16-17 and 18-19 were more likely than females to consume alcohol on a daily or weekly basis (AIHW, 2008).

Little is known about alcohol misuse amongst children who are Indigenous, living in remote places or socio-economically disadvantaged areas (AIHW, 2009). While adults who are Indigenous or living in remote areas are more likely to misuse alcohol than their metropolitan counterparts, it is difficult to extrapolate these findings to children in the same population groups.

4.4 The effect of alcohol on the developing brain

Alcohol crosses the placenta and as a teratogen it may inhibit normal brain development leading to neurological problems that include disinhibited behaviour, learning difficulties and a reduction in IQ (O'Leary, 2002, 2004). This may result in a diagnosis of alcohol-related birth defects (ARBD) and alcohol-related neurological disorders (ARND) under the broader category of foetal alcohol spectrum disorder (FASD) (Astley & Clarren, 2000; Hoyme et al., 2005; O'Leary, 2002, 2004; Streissguth et al., 2004).These disorders may not be diagnosed until children are at school and they are often associated with increased risk for mental health problems, alcohol and drug use and other related psychosocial problems (Streissguth et al., 2004).

Different genotypes influence the effect of alcohol on the human brain (Jacobson et al.,2006) and because the human brain continues to mature until the mid-20s (De Bellis et al., 2000; Moss, 2008) alcohol affects adolescents and adults differently. Studies with small numbers of humans and extrapolations from animal studies have found that adolescents who have identified alcohol problems show significant changes to their brain function (De Bellis et al., 2000). In particular, alcohol has been found to affect memory development (White & Swartzwelder, 2004) performance on attention-based activities (Brown & Tapert, 2004), and retrieval of verbal and nonverbal material (Brown & Tapert, 2004).

Adolescence is a time when there is often a normative increase in 'risky' behaviour. Changes to the brain's information processing and regulatory systems at puberty can lead to increased risk-taking behaviour that is exacerbated in the presence of peers and in high-risk situations (Steinberg, 2008). High-risk situations may result in increased impulsivity, sensation-seeking and thrill seeking (Reyna & Farley, 2006). It has been suggested that adolescents perceive risk in the same way as adults do, but changes in the brain's dopaminergic system at puberty lead to increased sensation-seeking behaviour in the presence of peers and other high-risk situations (Reyna & Farley, 2006; Steinberg, 2008). Not all adolescents engage in risk-taking behaviour, but 'early maturers' are more likely to do so than their peers of the same chronological age (Martin et al., 2002).

4.5 Australian Guidelines to Reduce Risks from Drinking Alcohol

The Australian Guidelines to Reduce Health Risks from Drinking Alcohol (NHMRC, 2009) provide a base for strategies that are aimed at developing safe and healthy drinking cultures. The guidelines for men and women hold that in order to reduce the risk of alcohol-related harm over a lifetime, no more than two standard drinks should be consumed on any day (NHMRC, 2009).

In addition, these Guidelines provide support to parents in their decision making regarding children's drinking. Specifically, Guideline 3 states :

- For children and young people less than 18 years of age, not drinking alcohol is the safest option.

- Parents and carers should be advised that children under 15 years of age are at the greatest risk of harm from drinking and that for this age group, not drinking alcohol is especially important.
- For young people aged 15−17 years, the safest option is to delay the initiation of drinking for as long as possible NHMRC, 2009, p. 4).

Whilst guidelines alone are unlikely to have significant impact,, they provide support to broader interventions that can be used at a population level. Guideline 3, that is particularly aimed at the use of alcohol by children and adolescents, needs to be clearly communicated to parents. The Guideline and the evidence upon which it is based, can be used to support and encourage parents to take an active role in reducing alcohol use amongst children and adolescents.

4.6 Initiation to alcohol

Trends in age of initiation to alcohol use are important to monitor as they provide a valuable gauge in assessing general alcohol consumption patterns amongst young people. Initiation to alcohol is occurring at an earlier age for each successive generation (based on 10-year age groups) (Roche et al., 2007). Recent reports from secondary data analysis indicate that for the current population aged more than 60, less than 20% had consumed a full serve of alcohol by the time they were 16 years of age (Roche et al., 2007). This compares with 70% of the population currently aged between 20 and 29 years (Roche et al., 2007).

The 2007 NDSHS reported that the mean age of initiation to alcohol for the Australian population was 17.0 years and this has remained stable over the last decade (AIHW, 2008). However, several national studies over the last decade indicate that young people aged between 12 and 19 years, on average, commence alcohol use at an earlier age. It is estimated that the mean age of initiation to a full serve of alcohol for young people currently aged 14-24 years is between 14 and 15 years of age (AIHW, 2007; King, Ball, & Carroll, 2005; Premier's Drug Prevention Council, 2005; White & Hayman, 2006).

While a large proportion of young people report having tried alcohol, far fewer report having consumed a full serve. Ninety percent of young Australians aged 14 years or more report having consumed alcohol at some time in their lives (AIHW, 2008). Twenty six percent of 14-19 year olds have never had a full serve of alcohol (AIHW, 2008), while one third of young people aged 12-15 report never having consumed a full serve of alcohol (AIHW, 2008). Reports from the Australian Secondary Students Alcohol and Drugs (ASSAD) survey indicate that rates of abstinence from alcohol fall sharply as age increases (White, 2001). While 27% of 12 year olds report never (i.e., not even a sip) having consumed alcohol, this decreases to 14% for 14 year olds and 4% for 17 year olds (White, 2001). These reports from cross-sectional studies are consistent with Australian longitudinal data over three years where only 14% of female and 17% of male adolescents report not drinking during adolescence (Moore, Coffey, Carlin, Alati, & Patton, 2009).

Initiation to alcohol is largely influenced by environmental factors (Hopfer, Crowley, & Hewitt, 2003; Koopmans & Boomsma, 1996; Pagan et al., 2006; Rose & Dick, 2004/05; Viken, Kaprio, Koskenvuo, & Rose, 1999). These factors include family, school, peer and neighbourhood influences and account for 76% of the variation in drinking initiation in both boys and girls (Rose, Dick, Viken, Pulkkinen, & Kaprio, 2001). However, it has been suggested that different environmental factors may influence initiation in each gender and this may reflect the fact that girls are generally more developmentally mature at age 14 than boys (Rose & Dick, 2004/05).

4.7 Genetic influences on alcohol use

It is generally accepted that there is, to some extent, a genetic transmission of a propensity to misuse alcohol. There is a genetic influence of the effect of alcohol on the developing foetus with genotypes that range from increasing harm to having a protective effect (Jacobson et al., 2006). Several studies that include family, twin and adoptee samples have provided evidence that alcohol dependence can be linked to genetic factors (Ball, 2007; Higuchi, Matsushita, & Kashima, 2006; Miles, Silberg, Pickens, Eaves, 2005; Rhee, Hewitt, Young, Corley, Crowley, Stallings, 2003).

4.7.1 Genetic versus environmental influences

While initiation to drinking is largely determined by environmental factors, patterns of drinking are strongly influenced by genetic factors that may be mediated by environmental variables (Pagan et al., 2006; Rose & Dick, 2004/05; Viken et al., 1999). The influence of genetic factors on the frequency of drinking increases as adolescence progresses (Koopmans & Boomsma, 1996; Pagan et al., 2006; Rose, Dick, Viken, Pulkkinen et al., 2001; Viken et al., 1999). Genetic factors have been reported to account for 33% of the variation in frequency of drinking at age 16, but 50% of the variation by age 18 (Rose, Dick, Viken & Kaprio, 2001). At the same time, environmental factors account for 37% of the variation in frequency of drinking at age 16, but only 14% by age 18 (Rose, Dick, Viken & Kaprio, 2001). Hence, family and community factors have their greatest influence on adolescents prior to and during the initiation phase, when drinking patterns are not yet established.

While environmental factors decrease in their direct influence across the adolescent years, they continue to play an important role in mediating the impact of genetic predispositions to alcohol misuse. For example, marital status and religiosity have both been shown to moderate the importance of genetic effects of alcohol consumption in women (Heath, Jardine, & Martin, 1989; Koopmans, Slutske, Baal, & Boomsma, 1999). Parental monitoring and support have also been shown to mediate the influence of genetic factors (Dick, Rose, & Kaprio, 2005). These findings suggest that genetic factors have an influence when moderating environmental variables are absent.

4.8 Factors that influence children's and adolescents' alcohol use

Parental and sibling alcohol use alone does not fully explain young people's drinking patterns (Poelen et al., 2007b). Many factors influence patterns of alcohol use amongst young people. Broadly, these can be divided into two groups. The first are those that can be attributed to broader social and environmental influences. These include modifiable determinants related to access and availability of alcohol. There is a wealth of high quality research on these factors, including systematic reviews. The second group of influences are those that pertain to the individual and their proximal environment. A number of these, such as family composition and size, are variables that cannot be readily altered and interventions are best targeted at variables that can be modified.

4.8.1 Broader social and environmental factors

There is a substantial amount of evidence that on a population basis, regulatory influences including price, access and marketing are key drivers of alcohol consumption by young people (Room et al., 2005; McKee et al., 2009). Evidence from systematic reviews indicates that increasing the price of alcohol is very effective in reducing alcohol-related harm amongst young people (Doran et al., 2008; Toumbourou, et al., 2007). Proximity to an on-premises liquor outlet (e.g. a bar), and off-premises liquor outlet (e.g. supermarket liquor outlet) have been shown to be correlated with very high-risk drinking amongst young people, as has 'bunching' of liquor outlets where patrons can move easily between licensed premises (Livingston, Laslett, & Dietze, 2008). A systematic review of seven cohort studies identified a correlation between exposure to alcohol advertising and subsequent alcohol use amongst young people aged 10-26 years (Smith & Foxcroft, 2009). Modes of advertising included broadcast and print media, in-store promotions, music videos and alcohol consumption in films. It was concluded that non-drinkers were significantly more likely to have become drinkers following exposure to alcohol advertising (Smith & Foxcroft, 2009). In Australia, a recent review of alcohol advertising on television found that many of the elements of the advertisements were appealing to children and that the current self-regulated Alcohol Beverages Advertising Code (ABAC) does not protect children from alcohol advertising (Fielder, Donovan, & Ouschan, 2009). This is consistent with reports from 90% of Australian parents who condemn the practice of marketing to children and suggest that it is "excessive" (Tucci, Mitchell, & Goddard, 2005).

In Australia, the ABAC has been criticised for not being managed and implemented effectively (Munro & de Wever, 2008). It has also been suggested that competing agendas within the alcohol and public health industries make it difficult for the two groups to find "common ground" (Munro & de Wever, 2008).

While the broader social and environmental factors that influence adolescent drinking are not the focus of this review, the idea that adolescents can 'control' their drinking, in the midst of a culture with high drinking expectations and limited regulation, has been condemned as simplistic and ineffective (Lindsay, 2009). Findings from large Australian

longitudinal cohort and cross-sectional studies indicate that universal prevention strategies are needed to address the misuse of alcohol by adolescents (Stockwell et al., 2004). These findings are supported by a recent national survey of Australian parents where 88% report that there is a need for more severe penalties for underage serving of alcohol and stricter enforcement and penalties for public drunkenness (Quantum Research, 2009). Volumetric taxation reform and advertising bans on alcohol have been identified as the two most effective interventions (in terms of both Disability-Adjusted Life-Years and cost-effectiveness) in the reduction of alcohol-related harm in Australian society (Doran et al., 2008). An understanding of the effectiveness of parental and sibling interventions needs to be examined within this broader context of the social and cultural environment and the known effectiveness of universal prevention strategies.

4.8.2 Individual factors

As previously described, unsafe drinking patterns have been significantly linked with several individual factors including age of initiation, current age and gender. Ethnic backgrounds, religion, access to money, and the influence of peers have also been correlated with drinking patterns. Young people with higher levels of recreational spending money are more likely to misuse alcohol (Kooreman, 2007; Livingston et al., 2008). In Victoria, Australia, young people from a non-English speaking household were less likely to report high-risk drinking (Livingston et al., 2008). There have been several reports on religion as a protective factor against alcohol misuse in adolescents (da Silva et al., 2007; Francis, Fearn, & Lewis, 2005; Milot & Bryant Ludden, 2008; Sinha, Cnaan, & Gelles, 2007) and while some religious cultural contexts may provide children with 'sips' of alcohol, the research on this and the long-term outcomes in relation to alcohol use is difficult to interpret. Inconsistency in the measurement of input variables such as religion, religiosity, culture and spirituality make comparisons difficult. Without longitudinal studies that examine these factors, we cannot draw firm conclusions about any link between alcohol use in a religious context and the later misuse of alcohol in adulthood.

Several studies have found that peer drinking patterns are strong predictors of adolescent alcohol use (Andrews, Tildesley, Hops, & Li, 2002; Bot, Engels, Knibbe, & Meeus, 2005; Windle, 2000). Peer influence may moderate adolescents' alcohol use, particularly if initiation to alcohol has already commenced (Dick et al., 2007). Both cross-sectional studies and longitudinal studies over a twelve month period have shown that friends' drinking patterns are a strong predictor of adolescent alcohol use (Andrews et al., 2002; Bot et al., 2005; Engels, Knibbe, Vries, Drop, & Breukelen, 1999; Windle, 2000; Wood, Read, Palfai, & Stevenson, 2001). However, the effect of peers' drinking may be over-estimated, as longitudinal studies conducted over 24 and 36+ months show that this effect diminishes as adolescence progresses. Further, when environmental and genetic factors are taken into account, the association between peer and adolescent drinking is non-significant (Andrews et al., 2002; Engels et al., 1999; Hill, Emery, Harden, Mendle, & Turkheimer, 2008).

4.9 Social development in childhood and adolescence

Socialisation is the process by which an individual learns and develops into a social being both individually and as a member of the broader community (Clausen, 1968). This process occurs via a multitude of relationships including family, friends, and teachers. The family, particularly the parent/s, is the most important regulator and shaper of socialisation. Family members are important agents of the lifelong process of socialisation through which an individual's behaviour patterns, values, standards, skills, attitudes and motives are shaped to conform to those regarded as desirable in a given social context (Clausen, 1968; Henslin, 1985). The socialisation model is a framework that suggests that by interacting with significant others (e.g. parents, siblings, peers), children's attitudes and social behaviours, including those concerning the consumption of alcohol, adapt. The bi-directional effects of parenting mean that this socialisation may be embedded in relationships that may extend across generations, cultures and history (Lerner, Rothbaum, Boulas, & Castellino, 2002).

4.9.1 Relevant Sociological Theories

The Constructionist Model of social development in childhood and adolescence is a useful sociological framework for explaining attitudinal and behavioural adaptation, risk, and resilience in childhood and adolescence. In *Constructivist Discourse on Resilience*, Ungar (2004) defines resilience as "…an outcome from negotiation with environmental resources to define one's self as healthy amidst adversity" (Ungar, 2004)(p. 341) .

Rather than assuming a systematic relationship between risk and protective factors, the constructionist approach conceptualises risk factors as context-dependant and complex. This model dovetails with the 'Strengths Approach' in which individual differences are celebrated as unique identifiers of resilience, rather than signposts of pathology. (Early & GlenMaye, 2000). Utilising the social constructionist model, which assumes an interaction between the individual, family and environment, mediated by socially constructed norms, it is possible to examine child and adolescent adaptation in light of multiple interacting and socially constructed influences. Familial, peer, community, and wider cultural social norms and attitudes are all thought to play an important role in the construction of child and adolescent behaviour, self-perception, resilience and mental and physical well being. Moreover, a reading of social constructionist texts highlights that the key to understanding resilience lies in understanding not just interactions within the family, or between peers, or within the school, but in an examination of the combined effects and interactions between all.

4.9.2 Primary Socialisation Theory of Substance Abuse

Primary Socialization Theory (PST) has been used to describe the influence of family, peers and school on adolescent behaviour and substance use. According to PST, adolescent substance use is most strongly influenced by the primary socialisation offered

by family, peers, and school environments, with strong positive attachment to family and non substance using peers being seen as protective factors against early or heavy substance use (Whitbeck, 1999). This theory has been supported by numerous empirical studies. (Fergusson, Swain-Campbell, & Horwood, 2002; Oetting & Donnermeyer, 1998; Henry, 2008). Alcohol-specific socialisation has also been investigated utilising PST as a framework, and again the role of primary socialisation has been supported (Van Der Vorst, Engels, Meeus, Dekovic, & Van Leeuwe, 2005) with parental rules and norms being positively correlated with reduced adolescent drinking (Van Der Vorst, Engels, Meeus, & Dekovic, 2006).

5. Family

Adolescents who misuse alcohol are generally not deprived in terms of their social, developmental or economic upbringings (Stockwell et al., 2004). Whilst adolescents who have experienced parental divorce have been found to have a higher likelihood of alcohol misuse (Paxton, Valois, & Drane, 2007; Thompson, Lizardi, Keyes, & Hasin, 2008), these outcomes may reflect mediating variables in the relationship between alcohol use, parenting skills and emotional support (Roustit, Chaix, & Chauvin, 2007). Low parental income is thought to have little independent effect on child behavioural outcomes (Dooley & Stewart, 2007) and a large cross sectional study across 28 European countries suggests that parental socio-economic status has limited effect on episodes of drunkenness in early adolescence (Richter, Leppin, & Gabhainn, 2006).

Parents' and siblings' attitudes towards, and use of alcohol are embedded in a broader culture that is subject to historical and socio-cultural influences. The normalisation of intoxication in Australian sport, media images and some licensed premises (Roche et al., 2007) is by way of role modelling, an influencing factor on the consumption of alcohol by adolescents and young people. There is no evidence to suggest that family members consciously 'glorify' their alcohol use to influence children's or adolescents' attitudes toward drinking. Instead, their influence is via a kind of 'wall-paper effect', i.e., drinking that is subsumed in a broader cultural context.

6. Parental influences

Parenting is an interactive process in which children have an important and influential role (Kerr, Stattin, & Engels, 2008). Longitudinal studies have found that in early childhood, a child's behaviour influences the behaviour of parents and other adults towards the child (Kerr et al., 2008). Hence, it is now accepted that parenting is both an "action and a reaction" (Kerr et al., 2008). The quality of the parent-child relationship underpins all aspects of parenting, both generic, and that which is specific to alcohol use by off-spring.

6.1 Parent-child relationships

Evidence to 2004

The Hayes et al. (2004) report examined parental influence using the Social Interaction Model and the Social Development Model (Catalano & Hawkins, 1996). The Social Interaction Model provides a framework in which parent-child relationships are central, parental motivations overarching, and behaviour management and monitoring interact with parent-child relationships. The model provides a framework for examination of the complex interplay of parent-child interactions. The Social Development Model allows for examination of ecological factors such as wider family and community influences, bi-directional influences between parent and child, the influence of peers and other broad risk and resilience factors influencing adolescent behaviour.

In the Hayes et al. (2004) report, four family-parenting styles were related to differing child outcomes Cohesive-Authoritative, Conflictive-Authoritarian, Defensive-Neglectful, and Permissive. Cohesive-Authoritative parenting has been found to be optimal, correlating in a number of studies with positive adolescent psychological adjustment. Reports from the Australian Temperament Project (Letcher et al., 2004) indicated that only parental monitoring levels, not parental warmth, were a direct contributor to substance abuse, however parenting styles were considered to be important mediators of this relationship. The balance of evidence found that family principles and rules, parental monitoring and adolescent family attachment all contributed to adolescent delay of alcohol initiation.

Evidence Update

Australian parents report being more permissive and less authoritarian than their own parents (Campbell & Gilmore, 2007). This has been linked to higher levels of parental education but it may also be moderated by socio-cultural changes that are linked to more liberal child rearing practices (Campbell & Gilmore, 2007).

6.1.1 Support

Findings from studies which addressed parental support and adolescent perception of supportive parenting were difficult to quantify, primarily due to the various definitions of support and the combining of other parenting issues with support/warmth and 'caring'. However, 21 articles were judged to be concerned either primarily with support or to have a significant component of 'support' within the design. The Hayes et al. (2004) findings were endorsed by all of these studies, with perceived supportiveness of parents strongly linked to the effectiveness of monitoring, reduced adolescent drinking levels and reduced peer influence over alcohol use (Goldstein, Davis-Kean, & Eccles, 2005; Parker & Benson, 2004; Wood et al., 2004).

Attachment to parents, which was predicted by support measures in a number of studies, further highlighted the importance of warmth, support and close family relationships in creating resilient youth (Kostelecky, 2005; Wetherill & Fromme, 2007). Supportive parenting continued to emerge as a strong mediator of peer influence, with an inverse relationship clearly evident between level of support in the home and level of peer influence on the young person (Barnes & Farrell, 1992).

6.1.2 Monitoring

Stattin and Kerr describe monitoring as an interactive process whereby parents and children contribute to the monitoring activity, i.e. parents' efforts to solicit information from their offspring needs to be matched with their child's willingness to disclose information about their activities and whereabouts. To be effective, monitoring should reflect a positive parent-child relationship (Stattin & Kerr, 2000).

Evidence to 2004

Of all the factors identified in the Hayes et al. (2004) review, parental monitoring was the most widely studied and provided the most consistent findings. In multiple studies with differing designs, parental monitoring was found to be inversely correlated with alcohol initiation, use and misuse. However, the impact of monitoring is greatly lessened without positive parenting style, close attachment, support and warmth. Of greatest influence was mothers' monitoring of girls, followed by mothers' monitoring of boys, fathers' monitoring of girls and finally fathers' monitoring of boys (which had the least impact). Additional monitoring of extra-curricular activities, peer associations and academic progress were all positively correlated with lower alcohol use by adolescents.

Lower parental monitoring has been correlated with externalising social problems, including deviant peer associations, which have been associated with accelerated substance use. Closer child-parent relationships are negatively correlated with the strength of peer influence on drinking. While in the short-term, peer drinking has been shown to be the greatest predictor of adolescent drinking, this may however under-estimate parental influence, as parental monitoring also affects peer selection.

Evidence Update

All but one of the studies published since 2004 that examined parental monitoring and adolescent alcohol reported significant preventative effects of parental monitoring on adolescent alcohol use. The single study which failed to detect a relationship was confined to a cross-sectional sample of Mexican-American youth, indicating a possible cultural variation in the effectiveness of monitoring in comparison to other parental strategies, such as injunctive alcohol specific rules and norms (Voisine, Parsai, Marsiglia, Kulis, & Nieri, 2008).

With the exception of one study from Finland, and one from the UK, all studies were based on US samples. Parental monitoring was found to directly influence alcohol use, even after controlling for related parenting practices such as support, alcohol-specific rules and parental alcohol use (Barnes, Welte, Hoffman, & Dintcheff, 2005; Beck, Boyle, & Boekeloo, 2004; Macaulay, Griffin, Gronewold, Williams, & Botvin, 2005). The effect was found for both genders, however a number of studies found the effect to be stronger for girls (Roche, Ahmed, & Blum, 2008; Veal & Ross, 2006). Monitoring of television viewing was also found to be protective, though few studies were identified in which this was the primary focus, and these were limited by small sample sizes and self-reported retrospective recall of perceived parental monitoring in childhood (Dalton et al., 2006).

For older adolescents, studies found that early parental monitoring reduced adolescent drinking during the high school years (Siebenbruner, Englund, Egeland, & Hudson, 2006) which predicted use in the college years, but that parental monitoring was no longer a mediator once the adolescent began college, when peers became the primary influence regardless of parent-child relationship quality (Arria et al., 2008; Parker & Benson, 2004). At the extreme end of the scale, supervisory neglect was found to increase adolescent alcohol and other drug use regardless of all other parent and child variables (Clark, Thatcher, & Maisto, 2005).

Results from several studies (Arria et al., 2008; Chapple, Hope, & Whiteford, 2005; Watkins, Howard-Barr, Moore, & Werch, 2006) indicate that adolescent "self-control" mediated the effectiveness of monitoring. Children with low levels of self-control were thought to be impulsive and not concerned about the consequences that may be linked to their behaviour. Higher levels of self-control were predicted by good relationship quality and parental control and support, indicating that early positive parenting experiences may facilitate effectiveness of later monitoring for prevention of alcohol use in adolescence. In addition, supervision alone emerges as a predictor of alcohol use, with adolescents who have unsupervised free time being at greater risk of initiation, use and misuse of alcohol (Duncan, Dawn, & Stephen, 2005).

The effectiveness of monitoring is dependent on bi-directional communication between parent and child. The most effective form of monitoring was seen to occur when adolescents felt supported in their discussions with parents, and able to discuss alcohol issues in an open and honest way. Higher levels of alcohol-specific communication were also found to increase adolescents' self-efficacy in alcohol refusal (Riesch, Anderson, & Krueger, 2006; Guilamo-Ramos, Jaccard, Turrisi, & Johansson, 2005). Where parents used surveillance alone, without open communication, monitoring was found to be less effective. In addition, studies demonstrated the continuing lack of parental knowledge and self-efficacy in relation to effective communication strategies to use with adolescents (Sherriff, Cox, Coleman, & Roker, 2008).

Monitoring was still found to have a significant impact for "at-risk" adolescents (those with histories of abuse, neglect, substance use disorders, mental health issues, family substance use issues or involvement in the juvenile justice system) (Coley, Morris, & Hernandez, 2004; Robertson, Baird-Thomas, & Stein, 2008; Shillington et al.,2005). For this subgroup, monitoring and support were the primary predictors of alcohol initiation, use and escalation. Thus, although strong and supportive parent-child relationships with high levels of communication provide the best foundation for effective monitoring, the importance of monitoring outside a positive parent-child relationship remains significant.

Since 2004, a few studies have specifically addressed aspects of offspring alcohol use related to parental control. All such studies found an inverse relationship between control and drinking behavior, however these were not uniform in type (de Haan & Boljevac, 2009; Fulkerson, Pasch, Perry, & Komro, 2008; Jarvinen & Ostergaard, 2009; Parsai, Voisine, Marsiglia, Kulis, & Nieri, 2009; Roche, et al., 2008). For example, Jarvinen and Ostergaard found a direct effect, with increased control predicting reduced binge drinking in adolescents, while Fulkerson et al. (2008) found an indirect effect, with control having a direct positive relationship only to increased monitoring, and monitoring having a direct effect on drinking levels. This result is interesting in light of the findings from a large longitudinal study (Roche et al., 2008) utilising data from the US National Longitudinal Study of Adolescent Health. Structural equation modeling identified direct effects for control only for males, while monitoring and family closeness were found to directly impact drinking for girls. The possible gender differences in the indirect and direct effects of control need further investigation. Gender differences were compared in the Parsai et al. (2009) cross-sectional study, which found an inverse relationship between parental control and drinking levels for both boys and girls, with the effect being significantly higher for boys.

6.1.2 a) Parental monitoring and initiation to alcohol amongst children

There is a positive relationship between parental monitoring, alcohol-specific rules and intention to use alcohol amongst children. Results of a large longitudinal study (Tildesley & Andrews, 2008) examining the development of children's intent to use alcohol during the primary school years found that monitoring predicted alcohol intentions for both girls and boys. The effect was significant only for girls, with rules and parental norms more significant for boys.

It is not enough to simply exhort parents to monitor their adolescent child's behaviour with respect to alcohol. Not all types of "monitoring" for example produce comparable outcomes, with "passive monitoring" (parental reliance on adolescent disclosure of activities) being shown in some studies to have no effect on adolescent substance use (Parsai et al., 2009). Recent evidence also suggests that poor parental monitoring goes hand-in-hand with discrepant parent-child relationships regarding alcohol use (McGillicuddy, Rychtarik, Morsheimer, & Burke-Storer, 2007).

Summary
Parental monitoring and support remain important variables in the parent-child relationship. Whilst not all studies clearly define monitoring, it is evident that where both parents and their children contribute to the monitoring, there is a correlation with later initiation to alcohol and subsequent alcohol use. While this level of monitoring largely relies on the quality of the parent-child relationship, there is evidence that outside of a positive parent-child relationship, monitoring can still have some effect in reducing alcohol use by children and adolescents.

6.2 Gender specific parenting

Evidence to 2004

A small number of studies were identified which demonstrated a possible link between gender and effectiveness of parental monitoring. Girls who were found to be more connected to family were more easily influenced by parents, particularly mothers, while boys may be influenced both by parental influences and external influences such as school and vocational interests and self-efficacy in these areas. Of note, communication skills may be particularly important as a protective asset for males.

Genetic factors increase risks for male offspring of alcohol dependent parents (Cleveland & Richard, 2003), however support for a greater effect of parenting behaviours, media, social norms and parental controls were cited as promising areas for further research. Importantly, for both genders, stress was found to mediate biological vulnerability to alcohol misuse disorders, with stress stemming from community, family and educational environments. For both genders, parental alcohol dependence was demonstrated to increase the child's stress, which in turn increases negative affect, association with deviant peers, and increased use of alcohol.

Child temperament was found to be a strong mediating factor; however no studies were found pre 2004 which investigated a causal model tracing early childhood experiences through to temperament and later alcohol use. Thus, the variation accounted for by biological as opposed to environmental factors was, in 2004, still unclear. Findings were evident, however, which suggested that for males, a good quality relationship mediated the effect of temperament while, for females the quality of the relationship and temperament separately predicted alcohol use. Hayes et al. (2004) reported a need for more research on the interactions of biology, parenting, environment and gender.

Evidence Update

Since the Hayes et al. (2004) report, new findings related to child/adolescent gender and alcohol use have been disappointingly few, with the field suffering from a lack of longitudinal data, and over-reliance on adolescent self-report. The studies which have

been conducted, however, highlight some important areas for further exploration and indicate some possible directions for prevention, delay, and control of adolescent drinking with more gender-specific targeting of preventative and treatment measures.

Recent evidence indicates that there is a closing gap between male and female risk-taking on the whole, however the greatest change has been the slope of increase in female drinking which is now near that of males (Abbott-Chapman, Denholm, & Wyld, 2008; Wells, Speechley, Koval, & Graham, 2007). Peer influence tends to be greater for males, however males were found to have a greater influence over female peers than did females over females or males (Gaughan, 2006). Thus, cultural norms for boys, such as media and paternal and peer role modelling, may be particularly important when considering the effect on attitude formation for young males.

The evidence indicates that both male and female adolescents are placed at greater risk of initiation and heavy use by disrupted family processes (Veal & Ross, 2006). However, parent-child relationship disruption, particularly within the mother-daughter dyad, may be a stronger mediator for girls. The correlation between early alcohol use and other risk factors appears to be high and gender mediated. In a number of studies, girls have been found to exhibit more internalising behaviours (such as self-harm, anxiety and depression) and substance-use, including alcohol use, in response to distressed family interactions and conflict (Yeh, Chiang, & Huang, 2006). It seems that for females, family cohesion and closeness, perceived parental involvement and support and maternal modelling may be the key factors determining alcohol use.

Support for the meditational role of mother-daughter relationships in female adolescent alcohol use was provided by a computer-mediated intervention program study which aimed to enhance mother-daughter relationships and prevent underage drinking by early adolescent girls (Schinke, Schwinn, Noia, & Cole, 2004). This study found that by improving mother-daughter communication, bi-directional positive regard and enhanced empathy, a modest effect for reduced drinking was achieved. It was unclear whether the cognitive behavioural aspect was as effective, and the sample size was small, however this study provides added support for the importance of the quality of rapport in the mother-daughter dyad. As alcohol initiation and use in girls significantly increases their risk for later alcohol dependence, early sexual debut, school failure, other drug use, young parenthood and involvement in the juvenile justice system (Nichols & Birnbaum, 2005), this is an important area for further study.

For boys, peer group influences and academic engagement may play a role as strong as parental monitoring and communication (Hsieh & Hollister, 2004). Association with deviant peers is however moderated by monitoring. Of significance is adolescent externalising behaviours (anger problems and delinquent or antisocial acts) that typically precede deviant peer associations, which can serve as indicators of risk and signals for the need for early intervention (Gavazzi, Lim, Yarcheck, Bostic, & Scheer, 2008; Hsieh & Hollister, 2004). Early initiation and use of alcohol by males increases their risk for later alcohol dependence, externalising behaviour, likelihood of involvement in serious accidents, and involvement with the justice system both as juveniles and later as adults.

Investigation of the predictors of alcohol misuse in boys reveals a mediational effect of deviant peers, academic success and perceived ability to move into employment.

Gender differences have been identified as risk factors for initiation to alcohol. Amongst girls, more frequent consumption of a family meal was reported as being a protective factor against early initiation (Fisher, Mile, Austin, Camargo, & Colditz, 2007). Self-esteem was identified as a significant risk factor for initiation to alcohol. Boys with higher athletic self-esteem and girls with higher social self-esteem were both more likely to initiate alcohol use earlier than those who did not (Fisher et al., 2007).

Summary
The gap between patterns of alcohol use by male and female adolescents is narrowing. Disrupted family relationships impact upon both genders, with boys being more likely to exhibit externalising behaviours and connection with deviant peers, phenomena that can be mediated by parental monitoring. Girls are more likely to exhibit internalising behaviours and efforts to improve mother-daughter relationships have been linked with reduced alcohol use.

6.3 Parental use of alcohol

Evidence to 2004

Adolescent drinking was positively linked to parental alcohol use, with a number of large studies finding that adolescent use was higher when they perceived parental drinking to be high. Further evidence was obtained from studies linking parental drinking to child and adolescent intention to use alcohol. Surprisingly, adolescent intent to use alcohol and positive expectations of alcohol use were not tempered by parental alcohol abuse, with children of alcohol dependent parents more likely to drink alcohol and hold positive outcome expectancies. Adolescents whose parents drank regularly (at least once per week) were also more likely to use alcohol at an earlier age.

Biological/genetic factors were reported, with boys genetically vulnerable for increased risk of alcohol abuse where fathers were alcohol dependant, however environmental effects were thought to have greater impact. It was posited that adolescents' parental drinking may lead to negative changes in parenting style such as decreased monitoring and decreased parent-child relationship quality which then lead to increased adolescent drinking behaviour. Latent growth modelling from longitudinal studies (Barnes & Farrell, 1992) showed that parental alcohol abuse had an indirect effect on adolescent drinking which was mediated through lowered parental support and monitoring. This changed parenting was thought to be the direct cause of increased adolescent alcohol usage. Attachment to caregivers was also significant; adolescents with weaker attachments to parents who drank, and stronger regard for or attachment to peers, were more likely to drink alcohol. Limited research showed a positive effect of modelling of safe levels of controlled drinking by parents; however findings were inconsistent, with few robust studies included.

Evidence update

Parental use of alcohol is generally understood to influence children's and adolescents' use of alcohol through social learning processes (Fagan & Najman, 2005). Young children's knowledge and attitudes towards alcohol have been linked to parental alcohol use. The ability of children aged 30-72 months to identify types of alcoholic drinks by smell is significantly correlated with parental patterns of alcohol use (Noll, Zucker, & Greenberg, 1990).

All of the studies published since 2004 support the prior literature showing that parental drinking was related to adolescents' alcohol use, with one study (Macleod et al.,2008) clarifying that postnatal, rather than prenatal, maternal alcohol use predicted children's alcohol use. Parental gender is a significant variable in parental influences on children's and adolescents' alcohol use. Maternal drinking and maternal depression are significantly linked with higher use of alcohol by children, compared to mothers who abstain (Fagan & Najman, 2005).

Summary
Embedded within social learning processes, parental drinking behaviours influence offspring alcohol use. This effect is influenced by the quality of the parent-child relationship. While maternal drinking patterns have been more closely linked with children's and adolescents' alcohol use, there is a need for more longitudinal evidence on this.

6.4 The impact of alcohol consumption on parenting skills

Evidence to 2004

It was posited that parental drinking may lead to negative changes in parenting style such as decreased monitoring and decreased parent-child relationship quality, which then lead to increased adolescent drinking behaviour. Latent growth modelling from longitudinal studies (Barnes & Farrell, 1992) showed that parental alcohol abuse had an indirect effect on adolescent drinking, which was mediated through lowered parental support and monitoring. This changed parenting was thought to be the direct cause of increased adolescent alcohol usage. Attachment to caregivers was also significant; adolescents with weaker attachments to parents who drank and stronger regard for, or attachment to peers were more likely to drink alcohol.

Evidence update

Despite being aware of their child's drinking some parents perceive that they lack credibility and skills in discussing the issue when they themselves are drinkers (Graham et al., 2006; Van Der Vorst et al., 2006; Ward, Snow, Munro, Graham, & Dickson-Swift, 2006). A systematic review that aimed to explore the impact of parents' drinking on

children's wellbeing found a relationship between "heavy" (as defined by the individual studies included in the review) drinking by parents/caregivers and violence against children, parental absence, parental conflict and parental control/supervision (Girling, Huakau, Casswell, & Conway, 2006). The review also identified a need for further research that includes parents from the "general" population. Whilst this study focused on parents/caregivers with "heavy" drinking it has relevance in the Australian setting where many adults (who are parents) misuse alcohol but may not have been formally identified as having an "alcohol problem".

Summary
The impact of parental drinking on parenting skills is mediated through the quality of the parent-child relationship. There is insufficient research in this area to identify recommendations for policy or practice. More research is needed to explore the impact of parental drinking on parenting skills, in particular on the quality of monitoring and control behaviours during special events.

7. Alcohol specific parenting

7.1 Parents' knowledge

Evidence to 2004

Differential reporting of adolescent alcohol use levels by parents and adolescents indicates that parents consistently underrate their children's level of alcohol consumption. Parental education about their own efficacy and intervention techniques was shown to correlate with reduced drinking in adolescents, demonstrating a need for greater parental knowledge in the area. Parental knowledge was directly related to the child-parent dyadic quality. Adolescents who felt able to disclose their drinking to parents were more likely to heed parental warnings and reduce future drinking levels. In addition, parents were more likely to be more concerned about illicit drug use than alcohol use, despite alcohol being far more available and associated with more risks. These findings from the Hayes et al. (2004) study clearly indicated a need for more collaborative reports on alcohol consumption rather than reliance on adolescent self-report measures.

Evidence update

Inevitably, parents may underestimate their influence and be somewhat optimistic in their assessment regarding the amount of alcohol their son or daughter is drinking, hence they need to be provided with accurate information about drinking levels in their community and the short and long term harms attached to these, in order to arrive at informed positions on drinking by their off-spring. It is possible that better-informed parents would be more willing partners in school-home alliances aimed at delaying alcohol initiation and reducing levels of harmful drinking (de Haan & Boljevac, 2009).

Sixty percent of Australian parents agree that drinking alcohol affects the development of adolescents' brains and only 24% report supporting alcohol use by adolescents at parties (Quantum Research, 2009). However, behaviour changes may not be effective if they are not combined with social, environmental and economic changes. In addition, it is difficult to separate parental knowledge of young people's behaviour from the level of warmth and closeness that exists in the parent-child relationship, as the latter promotes the former, i.e., knowledge seems to be mediated by the quality of parent-child communication, which in turn influences the way the young person interprets the parent's interest in their activities, friendship networks, and behaviours regarding alcohol.

Summary
While measures of parental knowledge in relation to alcohol use by children are useful, they are not necessarily linked to positive behaviours in terms of reducing alcohol mis/use by children and young people. Instead, knowledge is embedded in the broader context of the parent-child relationship and social, economic and environmental factors that affect parents' ability to change their behaviour.

7.2 Parents' attitudes, norms and perceptions of influence

Evidence to 2004

There was a strong correlation between parental attitudes towards appropriate age of initiation and subsequent alcohol use by adolescents, and the age at which parents accepted alcohol use by adolescents at home correlated with age of initiation (Hayes et al., 2004). Over a twelve year period between 1986 and 1998, reports from the Australian Temperament Project (Letcher et al., 2004), of the age at which parents thought adolescents should be able to drink remained consistent at approximately 18 years of age. However, during the same period, it was suggested that adolescents' perceptions of the age at which they should be allowed to drink alcohol had fallen to approximately 17 years. Adolescents allowed to drink at home were more likely to drink, and adolescents allowed to bring alcoholic beverages to social occasions were also more likely to be early drinkers.

Evidence update

Recent research supports earlier evidence pointing to the need for family relationships to be sufficiently robust as to be able to withstand the influence of peer relationships during the adolescent years (Nash, McQueen, & Bray, 2005). Recent studies (Abar & Turrisi, 2008; Padilla-Walker, Nelson, Madsen, & Barry, 2008) examining the effect of parental attitudes and norms regarding adolescent alcohol use suggest that these have a "shelf life" that extends beyond the end of secondary school and even continue to be influential when the young person is separated by considerable geographic distance, e.g., by leaving home

in order to attend college/university. A positive family environment seems to attenuate potentially negative effects of peer influence during the adolescent years (Wetherill & Fromme, 2007) adding further weight to evidence supporting early parenting programs. Recently published research has also highlighted the bi-directionality of the parent-child relationship, particularly during the adolescent years – so not only is the adolescent influenced by the parent, but the parent is also influenced by the temperament and responsiveness of the adolescent (Clark, Kirisci, Mezzich, & Chung, 2008; Padilla-Walkeret al., 2008).

Other recent findings (Parsai et al., 2009; Voisine et al., 2008) refer to "*parental injunctive norms*" – "…the adolescent's perceptions of their parents' expectations for their behaviour, including the parent's expected reaction to the adolescent's use of substances" (Voisine et al., 2008 p. 265) . Obviously the young person's perception regarding his/her parent's position on alcohol is an important component of this norm, which in turn has been found in Mexican samples of adolescents to be a strong predictor of adolescent substance use (Voisine et al., 2008). Further culture-sensitive research on this important construct is warranted.

Parents may under-estimate the extent to which their influence persists over the longer term. It should be noted, however, that both positive and negative influences seem to have this long-range potential, so parents who drink, for example, are more likely to hold permissive attitudes about their off-spring drinking (Van Der Vorst et al., 2006). Some parents seem to believe that if they themselves drink, they would be hypocritical if they attempted to delay/prevent their adolescent son/daughter's initiation into alcohol use. Van Der Vorst et al. (2006) observed that their own (responsible) drinking should not prevent parents from setting and enforcing alcohol-specific rules for their teenager. These same researchers also suggest however, that alcohol-specific rules need to be reinforced over time – simply presenting these to young adolescents will not necessarily ensure that they are retained / observed by older adolescents.

Asking a parent to communicate clear attitudes and expectations with respect to alcohol assumes that he/she is able to overcome a possible reluctance to express negative views about alcohol use by young people. This concern on the part of parents that they might be seen as "wowsers" by their off-spring and/or by other parents is another obstacle that needs to be directly addressed in parent-education programs during the secondary school years. Parents need to be encouraged and assisted to (a) clarify their own views on alcohol use by their adolescent off-spring and (b) confidently assert these as a caring but authoritative parent.

Summary

Parents can under-estimate the extent and durability of their influence on their adolescent offspring's behaviour; in some cases this influence can extend over long time periods and geographical distances. The bi-directional nature of parent-child influence also needs to be understood by parents. A positive family environment can be protective against the broader negative factors that influence alcohol use by children and adolescents. Some parents express concern about the credibility of their messages to children and adolescents when they themselves mis/use alcohol. Parents need to implement alcohol-specific rules for their children that are reinforced and re-visited over time, as the nature of the risks faced by the young person change.

7.3 Parental Supply of Alcohol and "Controlled Initiation" by parents

Parental supply of alcohol to children and adolescents can taken both an active and a passive form. Active supply of alcohol occurs when parents actually supply alcohol either via tastes/sips or full drinks in the home, or by purchasing alcohol for children/adolescents to take and consume outside the home. Passive supply occurs via inconsistent or non-existent monitoring of alcohol quantities consumed in the home, thereby making alcohol an "available" and easily accessible commodity.

Evidence to 2004

Hayes et al. (2004) found that most adolescents have begun experimenting with alcohol by 14-15 years, with a large number obtaining their alcohol from parents. Some parents were of the belief that controlled initiation would prevent harmful drinking later, however, inadequate research has been conducted to support or discredit the purported benefits of this practice. The majority of studies showed that parental acceptance and provision of alcohol to young people was taken as tacit approval and led to earlier drinking, increased intention to use alcohol and heavier drinking over time.

Studies investigating controlled and monitored drinking in the home have produced conflicting reports. Despite some weak findings suggesting that controlled drinking may reduce risky drinking behaviour, adolescents permitted to drink in the home were found to drink earlier and drink more when away from the home setting. In other words, adolescents may see the controlled introduction to alcohol as an implied acceptance by parents of their drinking. Closely correlated with parental norms about adolescent drinking and parental rules, parental supply and initiation is correlated with more positive expectations about drinking in children, and higher alcohol use rates at follow up. Hayes et al. (2004) recommended the need for further research in this area.

Evidence update

There have been several studies published since 2004 that explored the role of parental supply and controlled initiation of alcohol. Almost half of Australian parents believe that they should teach their children to drink at home before they reach the age of 18 (Quantum Research, 2009) and this number is higher for older parents (45+) and those living in regional areas (Quantum Research, 2009).

It is therefore not surprising that children's consumption of alcohol in the family home is often sanctioned by parents and it is a practice that appears to be common. Most "sipping" of alcohol by young children, occurs under parental supervision in the family context (Donovan & Molina, 2008). The most common source of supply of alcohol to adolescents in Australia is parents, with 37% of 12-17 year olds reporting that their parents gave them their last drink (White & Hayman, 2006). Males were significantly more likely than females to access alcohol from commercial sources and friends' parents (Hearst, Fulkerson, Maldonado-Molina, Perry, & Komro, 2007). In Australia, some parents supply alcohol to their adolescent children in the belief that this is the "norm" and if they do not supply it, their children will approach others to purchase alcohol for them (Ward et al., 2006). This belief is supported by the recent ASSAD survey where all students consumed less alcohol per week if they obtained alcohol from their parents rather than have someone else buy it for them (White & Hayman, 2006). It also appears common for parents to allow alcohol consumption amongst children and adolescents on "special occasions" (Eaton et al., 2004). These findings suggest that many parents sanction the use of alcohol in the family home and that family structures and parenting styles may be important factors in determining place of initiation to alcohol (Komro, Maldonado-Mollina, Tober, Bonds, & Muller, 2007).

International and Australian research has consistently concluded that the place and age of initiation to alcohol are linked; the earlier the age of initiation, the more likely it is to occur in the family home (Hellandsjo Bu, Watten, Foxcroft, Ingebrigtsen, & Relling, 2002; White & Hayman, 2006). Australian parents often cite European drinking practices (where children and adolescents drink socially with their families from a young age) as an example of introducing alcohol in a controlled manner with the aim being to reduce the "novelty" of alcohol (Ward et al., 2006). However, it appears that the broader social context of these European settings and changing cultural practices is not considered. Young people in southern Europe are in fact changing their drinking practices, and becoming more like their western counterparts, thus attempts to extrapolate across different countries and cultures should be viewed with caution (Craplet, 2005).

Findings from a three-year prospective cohort study in the United States identified several risk factors for initiation to alcohol use (Fisher et al., 2007). As might be expected, older age, later maturational stage, smoking, peer drinking, positive attitudes towards alcohol, underage sibling drinking, willingness to use alcohol-related promotional items, and the presence of adults drinking in the home were predictors amongst both male and female adolescents (Fisher et al., 2007).

The evidence-base is growing to suggest a) that the more strongly youth agreed that their parents thought it was acceptable for them to use alcohol, b) that they had easy access to alcohol, or c) that it was considered acceptable for children to drink on special occasions, the more likely they were to have ever used alcohol. These data strongly suggest that harm reduction strategies normalise consumption and are counterproductive (Komro et al., 2007). Reduction in social supply of alcohol is an important strategy for prevention of initiation especially amongst preadolescents (Hears, et al., 2007; Komro et al., 2007; Williams & Mulhall, 2005). Longitudinal data has shown that child reports of parental supply of alcohol for their last episode of drinking are a strong predictor of increased alcohol use over time (Komro et al., 2007). Also, overseas research suggests that when parents do not supply alcohol, adolescents do not increase their consumption of other alcoholic drinks (Lundborg, 2007).

Encouragingly, evaluation of the effectiveness of a social marketing campaign, in New Zealand, designed to increase parental awareness of not providing alcohol showed promising trends (Kypri, Dean, Kirby, Harris, & Kake, 2005). In addition, surveys of parents show that they are generally opposed to alcohol supply to minors (or they specify "responsible conditions" of supply), that they support legal restrictions on availability and promotion, and greater enforcement of liquor laws (Kypri, Dean, & Stojanovski, 2007). This suggests that legislation and reduction in social supply of alcohol are likely to be widely acceptable to the community. A meta-analysis of 18 papers describing nine independent trials suggests that the overall effect of family interventions on the use of alcohol by adolescents is small, yet consistent and effective even at 2 years (Smit, Verdurmen, Monshouwer, & Smit, 2008).

In recent years, secondary supply legislation has been introduced in New South Wales and Queensland (Community Alcohol Action Network, 7 April 2008; New South Wales Parliament Offences Relating to Sale or Supply of Liquor to Minors Liquor Act, 2007, 117) and it has recently been debated in the Tasmanian parliament also (Community Alcohol Action Network, 9 June 2009). Secondary supply legislation makes it an offence to supply alcohol to minors in a private home without the direct approval of a parent or guardian. This legislation has been welcomed by advocates against alcohol-related harm and there is intensive lobbying to support the introduction of similar legislation in all Australian states and territories.

Summary
Many parents sanction the use of alcohol in the family home in the belief that it will teach their children to drink responsibly. The age and place of initiation to alcohol use are linked. The earlier the age of initiation, the more likely it is to occur in the family home. Many Australian parents initiate their children to alcohol using the southern European drinking model as a guide. However, they do not consider the broader social norms around drinking in that very different (and indeed changing) cultural environment. Parents are the most common source of supply of alcohol for children and adolescents and it appears that their efforts to "teach" their children about alcohol only serve to

normalise the use of underage alcohol. While The Australian Drinking Guidelines (NHMRC, 2009) recommend that for children and adolescents under the age of 18, not drinking is the safest option, many parents are concerned that if they do not provide their children with alcohol, someone else will. Parents need advice and support with regard to alcohol use by their children. There is a need for a broader social marketing campaign to support parents in using evidence-based strategies to reduce alcohol use by their children.

8. Siblings

Numerous studies have documented links between peers, parenting characteristics and behaviours, family structures and adolescent alcohol use (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2006; Choquet, Hassler, Morin, Falissard, & Chau, 2008; Dalton et al., 2006; Engels, Van De Vorst, Deković, & Meeus, 2007; Gerrard, Gibbons, Zhao, Russell, & Reis-Bergan, 1999; Hawkins, Catalano, & Miller, 1992; Hingson, Heeren, & Winter, 2006; Jablonska & Lindberg, 2007; Kemppainen et al., 2008; Knoester, Haynie, & Stephens, 2006; Kuendig & Kuntsche, 2006; Kuntsche & Kuendig, 2006; Kyle & Michael, 2007; Latendresse, Rose, Viken, Pulkkinen, Kaprio & Dick, 2008; Livingston et al., 2008; Mezzich, Tarter, Kirisci, Feske, Day, & Gao, 2007; Nash et al., 2005; Otten, van der Zwaluw, Van Der Vorst, & Engels, 2008; Paxton et al., 2007; Poelen et al., 2007b; Roche et al., 2008; Sherriff et al., 2008; Shortt, Hutchinson, Chapman, & Toumbourou, 2007; Smit et al., 2008; Smith, Sells, Rodman, & Reynolds, 2006; Spijkerman, van den Eijnden, & Huiberts, 2008; Van Der Vorst et al., 2006; Van Zundert, Van Der Vorst, Vermulst, & Engels, 2006; Velleman, Templeton, & Copello, 2005; Warner, White, & Johnson, 2007; Yeh et al., 2006). However, the role of siblings in influencing attitudes and use of alcohol by adolescents has received comparatively little attention. This section of the review focuses specifically on the influence of siblings on adolescent use of alcohol. This is primarily for two reasons (a) the use of alcohol in childhood is usually as a result of parental initiation and/or supply (b) there is no published research on the role of siblings in influencing alcohol use in early childhood.

Of the 54 articles that were retrieved after being identified as being relevant to this section of the review, the majority were cross-sectional. Most of the longitudinal studies, were based on genetically informed designs (Hill et al., 2008; Maes et al., 1999; Pagan et al., 2006; Penninkilampi-Kerola, Kaprio, Moilanen, & Rose, 2005; Rose, Dick, Viken, & Kaprio, 2001; Viken et al., 1999). Hence, there is very little longitudinal data on the environmental factors and the role of siblings in relation to adolescent alcohol use.

8.1 Socialisation by siblings

Parents have primary responsibility for the socialisation of their children (Baumrind, 1978). This process of socialisation includes education, training, and imitation as children acquire habits and values that are consistent with the surrounding culture (Baumrind, 1978). In the early childhood years, parents generally have unquestionable authority. As children make the transition into adolescence, this authority shifts, whereby the adolescent is gradually granted reasonable autonomy to make decisions (Holmbeck & O'Donnell, 1991). While most adolescents still rely on their parent/s as a source of

emotional and practical support (Smetana, Metzger, Gettman, & Campione-Barr, 2006) adolescence is characterised as a time of striving for individual identity and independence. It is a time in which socialisation with friends (who may be siblings or others) becomes more influential (Furman & Buhrmester, 1992).

Older siblings can be powerful role models as they generally have a long history of shared experiences. The hierarchical nature of sibling relationships means that siblings, particularly those who are older, are generally viewed as a source of guidance and support for their younger brothers and sisters (Jenkins Tucker,, Barber, & Eccles, 1997). As siblings enter adolescence, the relationship appears to become less unequal and there is more power sharing (Buhrmester, 1992). Exposure to siblings' alcohol use exposes adolescents to the drinking patterns of siblings' peers and in turn, this increases adolescents' experiences and contact with alcohol (Windle, 2000).

8.2 Genetic versus environmental influences

There is evidence that genetic effects influence the development of alcohol disorders and patterns of drinking in sibling pairs (Fagan & Najman, 2005; Harden, Hill, Turkheimer, & Emery, 2008; Hill et al., 2008; Hopfer et al., 2003; Jacob et al.,2003; Maes et al., 1999; Rose, 1998). However, there is an influence of alcohol use by non-biologically related adolescents which indicates that environmental factors also have an effect (McGue, Sharma, & Benson, 1996).

Twin studies provide valuable insights into the relative genetic and environmental contributions towards substance use disorders amongst siblings because they analyse data from monozygotic (MZ; 100% genetic similarity) and/or dizygotic (DZ; on average 50% genetic similarity) twin pairs. In regard to environmental influences, there should not be any significant differences between MZ and DZ twins as the majority of twin pairs live with one another throughout their childhood and adolescence. Therefore, if genetic factors are of primary importance, MZ twins should resemble each other approximately twice as much as DZ twins.

However, one of the problems with studies that only include twin samples is that they cannot differentiate between environmental factors that are shared by all family members and environmental factors that are shared only by the same-age twin pairs. Hence, twin studies that include non-biologically related siblings enable examination of shared environmental and non-additive genetic influences. A study of MZ, DZ and adoptive adolescent sibling pairs indicates that the magnitude of genetic influence on problem alcohol use is much higher than that for initiation to and use of alcohol (Rhee et al., 2003). That is, environmental influences have a strong effect on alcohol initiation and alcohol use. This is consistent with the findings of a study of the offspring of MZ and DZ twins (who had diagnosed alcohol disorders (AD) as defined by DSM-IV-TR). Offspring of MZ twins (who both had AD) were more likely to display AD than the offspring of non AD twins. Interestingly, offspring of a MZ twin who had AD (but whose co-twin did not have AD) were no more likely to exhibit AD than the offspring of non AD twins.

This supports the hypothesis that low-risk environments can moderate the effect of high genetic risk for the development of AD (Jacob et al., 2003).

Summary
While genetic factors do have an influence in the development of alcohol disorders amongst siblings, environmental factors can reduce the impact of high genetic risk. The impact of social/environmental influences appears to be greater than the influence of genetic factors for initiation to and use of alcohol and these factors can also be reasonably targeted by public health interventions.

8.3 Sibling relationships

Sibling relationships are developmentally important and commence in early childhood (Dunn, 1983). The quality of the sibling relationship is thought to be stable from middle childhood through to early adulthood, such that feelings of rivalry that may have originated in early childhood can impact on the adult sibling relationship (Brody, 1998). Such conflict between siblings can have a significant impact on personality (Dunn, 1983). Where the relationship is viewed as being positive, siblings are more likely to spend time together and observe and learn from each other's behaviour (Brody, Flor, Hollett-Wright, & McCoy, 1998; Slomkowski, Rende, Conger, Simons, & Conger, 2001; Yeh & Lempers, 2004). So, much of the mutual influence that occurs between siblings in adolescence often commences in the early childhood period.

8.3.1 Influence of sibling relationship on drinking behaviour

There are conflicting reports about the impact of the quality of the sibling relationship on drinking behaviours and influences. While some researchers have found a strong correlation between the quality of the sibling relationship and sibling influence on drinking behaviours (Brody, Flor et al., 1998; Row & Gulley, 1992; Slomkowski et al., 2001; Yeh & Lempers, 2004) others have found that the quality of the relationship does not alter the effect of the correlation between the drinking behaviour of adolescent sibling dyads (Van Der Vorst et al., 2007). These differences may be a result of the quality and the variance in the scores of sibling relationships within individual studies. While it has been suggested that the sibling relationship itself, rather than shared family influences, may best account for sibling resemblances in alcohol use (Fagan & Najman, 2005) these findings are from cross-sectional studies and may not account for the fact that the mutual influence of sibling dyads' alcohol use may result from existing mutual influence processes (Van Der Vorst et al., 2007). There is a need for longitudinal data that explores the nature and quality of the sibling relationship and the impact of this on sibling drinking behaviours.

Summary
The strength and quality of sibling relationships exerts an influence that extends beyond childhood and adolescence, to adult life. The evidence regarding the impact of the sibling relationship on adolescent alcohol use is conflicting. Longitudinal data is needed to examine the impact of the sibling relationship on alcohol use, in particular on how the quality of the relationship influences this beyond the mechanism of shared family influences.

8.4 Siblings' norms and perceptions about alcohol

Norms and beliefs about drinking influence alcohol use by adolescents (Aas & Klepp, 1992). Siblings have been reported as being more broad-minded about the use of alcohol by boys than girls but this is also linked to adolescents' own drinking patterns and so may be a reflection of higher patterns of alcohol use by males than females (Van Der Vorst et al., 2007).

8.4.1 The influence of sibling norms and perceptions on drinking behaviours

Early cross-sectional studies identified a relationship between adolescents' consumption of beer and "hard liquor" and sibling attitudes and modelling (Needle, McCubbin, Wilson, Reineck, Lazar & Mederer, 1986). However, longitudinal research suggests that adolescent norms about alcohol do not alter the influence of older siblings alcohol use and younger siblings use (Van Der Vorst et al., 2007). This may be a result of the fact that, to a large degree, siblings do not share the same norms about alcohol but this is also dependent on whether siblings have insights into each others drinking norms (Van Der Vorst et al., 2007). The drinking patterns of younger adolescents are altered by perceptions of how much alcohol an older sibling consumes but there is no evidence that older siblings are aware of this influence (D'Amico & Fromme, 1997). The more alcohol younger siblings perceive their older sibling drinks, the more alcohol they themselves are likely to consume (D'Amico & Fromme, 1997). Again, this reinforces the importance of using validated and collateral measures of sibling alcohol use.

Permissive parental norms on alcohol use positively influence children's alcohol use (Parsai et al., 2009; Voisine et al., 2008) and this may be mistaken for mutual influences of sibling norms.

Summary
Where siblings have insights into each others' alcohol norms and patterns of drinking, there is more likely to be sibling influence. However, the influence of sibling norms on adolescent alcohol use may be a reflection of parental norms and not a product of mutual sibling influence processes per se.

8.5 Sibling alcohol use

Several international studies have found that sibling alcohol use is often similar and that the patterns of alcohol use by one sibling are significantly linked to the other (Bahr, Hoffmann, & Yang, 2005; Brook, Whiteman, Gordon, & Brook, 1990; Chaveepojnkamjorn & Pichainarong., 2007; Duncan, Duncan, & Hops, 1996; Epstein, Botvin, Baker, & Diaz, 1999; Fagan & Najman, 2005; McGue, Sharma & Benson, 1996; Miller & Volk, 2002; Windle, 2000). However, there is no data on the prevalence of drinking by older siblings living in Australian families.

While cross-sectional studies have highlighted that siblings affect each others' patterns of drinking, longitudinal studies have found that sibling influence explains only a small part of the variance in sibling alcohol use over time (Ary, Tildesley, Hops, & Andrews, 1993; Poelen et al., 2007b). It appears that shared environmental factors explain most of the variance in drinking patterns amongst adolescent siblings (Penninkilampi-Kerola et al., 2005).

Consistent with patterns of alcohol use amongst adolescents (AIHW, 2008) sibling dyad studies have demonstrated that drinking increases with age. That is, as older sibling alcohol use increases so too does that of the younger adolescent sibling (Van Der Vorst et al., 2007). However, the inverse has not been found to be the case. Results of longitudinal research have not been identified bi-directional influences on drinking behaviours between sibling pairs (Van Der Vorst et al., 2007).

Summary
Cross-sectional data suggests that the influence of adolescent sibling alcohol use is bi-directional. However, longitudinal studies indicate that sibling influence explains only a small part of the variance in sibling alcohol use over time and that instead this may be mediated by shared environmental influences, family/parenting factors, and patterns of increased alcohol as adolescents' age.

8.6 Sibling influence on initiation

Siblings have been reported as having an influential role in relation to adolescents' initiation and intention to use alcohol and patterns of drinking both in terms of volume and frequency (Epstei, et al., 1999). However, longitudinal research with sibling twins found that common environmental factors explained most of the variance in alcohol use at age 14 (Rose, Dick, Viken, Pulkkinen, et al., 2001).

Summary
While siblings have been reported as having an influence on adolescents' initiation to alcohol, common environmental influences including parental norms and behaviour, access to and supply of alcohol are more likely to explain this influence.

8.7 The impact of age and gender

Older siblings are more likely to drink alcohol (Van Der Vorst et al., 2007). This is consistent with what is known about adolescent patterns of drinking, i.e., there is a direct correlation between age and alcohol consumption (AIHW, 2008).

Age and gender have been reported as contributing factors in the influence of siblings on adolescent alcohol use. While there is no evidence of a specific age at which adolescent siblings have the most influence on alcohol use by their brother or sister, siblings of the same gender who are closer in age have been reported as being more likely to influence adolescent drinking patterns (Boyle, Sandford, Szatmari, Merikangas, & Offord, 2001; McGue et al., 1996) while siblings more than two years apart have been reported as being less likely to influence younger siblings' alcohol behaviours (Boyle et al., 2001). Having a mono-zygotic twin is a greater risk factor for adolescent drinking than drinking by other siblings (Poelen et al., 2007b; Scholte, Poelen, Willemsen, Boomsma, & Engels, 2008). Consistent with social learning theory, sibling relationships are strongest when they are close in age and the same sex (Boyle et al., 2001: McGue et al., 1996). This may be explained by the fact that drinking in adolescence is highly age dependent and siblings closer in age have stronger socialisation dynamics and thus can be expected to spend more time together during adolescence. This leads to more shared experiences in terms of school, peers and leisure activities and easier access to alcohol (Boyle et al., 2001).

The influence of age may depend on the siblings' ages. If the siblings are both older adolescents and have established drinking patterns, there may be stronger bi-directional influences between siblings (Van Der Vorst et al., 2007). Older siblings who use alcohol are more likely to have peers who reflect their own alcohol consumption patterns and this in turn provides a role model and point of access to alcohol for younger siblings (Boyle et al., 2001).

Longitudinal research has shown that there are no significant differences in the effect of older siblings' alcohol use on young siblings' drinking and vice versa for different and same sex sibling dyads (Van Der Vorst et al., 2007).

Summary
Drinking in adolescence is highly age dependent. Cross-sectional studies have identified mutual influences in alcohol use between siblings of the same gender and of similar age. However, longitudinal data indicates that while older siblings' drinking affects that of younger siblings, gender has no clear effect on sibling influence.

8.8 Sibling influences on adolescents' selection of friends

Genetic factors are known to influence adolescents' selection of friend (Hill et al., 2008). Adolescents with similar drinking behaviours and personalities are more likely to become friends than those without such resemblances (Cleveland, Wiebe, & Rowe, 2005). Similarly, longitudinal research has found that siblings' patterns of drinking are influential in the selection of adolescents' drinking friends and this in turn has been linked with adolescents' drinking patterns (Conger & Reuter, 1996). This association between siblings and the selection of friends may be an artefact of shared genes. In addition, siblings may influence the alcohol use of their younger brother or sister through their influence on the adolescents' friends (Ary et al., 1993).

8.9 Siblings versus parental influences

Adolescent alcohol use is not independent of parent/family influences and so some resemblance of alcohol use between siblings is not surprising. In a supportive and positive relationship, parental permissiveness, drinking habits and alcohol-specific rules have been identified as influencing adolescent norms about drinking (Van Der Vorst et al., 2007; Brody, Flor et al., 1998; Van Der Vorst, 2005) These factors may influence siblings' alcohol use and create similarities in sibling norms towards and use of alcohol.

Again, cross-sectional studies suggest that the influence of siblings on younger children's attitudes towards, and use of alcohol is stronger than that of parents (Boyle et al., 2001 ;Brook et al., 1990; Fagan & Najman, 2005) however, longitudinal studies indicate that this effect diminishes over time. Parent influence may be present through socialisation of their children and through shaping of the selection and behaviour of adolescents' peers (Ary et al., 1993). Similarities in sibling alcohol consumption may be mediated through other variables including parental drinking patterns and enforcement of alcohol-specific rules (Van Der Vorst et al., 2005) or having the same peers with similar patterns of drinking (Hetherington, Reiss, & Plomin, 1994).

Only a few studies have explored the bi-directional influence of alcohol use between siblings. Most of the studies on the role of siblings in influencing adolescent alcohol have been cross-sectional, so the lack of prospective data means that the bi-directional influence of sibling alcohol use remains unclear (Van Der Vorst et al., 2007). There is a need to review the evidence on the role of siblings in relation to adolescent alcohol use using systematic review methodology. This would provide a basis for further longitudinal research in this area.

9. Methodological issues

9.1 Reliable and validated definitions and measurement

One of the difficulties in examining trends in initiation to alcohol use is that the definition of initiation (in terms of the volume of alcohol) is often unclear. In Australia, reports of young peoples' initiation range from having "tried" a "sip" or more of an alcoholic beverage to consuming one standard drink (full serve) which contains 10 grams of alcohol (AIHW, 2007, 2008; White & Hayman, 2006). The NHMRC guidelines do not define initiation (NHMRC, 2009), and nor are definitions of a "sip" available in the literature. The lack of a standardised definition makes it difficult to examine trends in initiation to alcohol amongst children and adolescents.

This definitional problem regarding measurement also pertains to the examination of alcohol use amongst children. Retrospective reports about alcohol consumption in early childhood are notoriously unreliable (Donovan, 2007). While national surveys report collecting alcohol consumption data on children aged 12 years and above, the research examining alcohol use in early childhood often lacks detail about the measure of frequency and volume of alcohol use (Fergusson et al., 1994) and so comparisons between studies over time are difficult. The volume of alcohol consumed is important because the number of episodes of intoxication and the age at which they occur appears to predict the misuse of alcohol in adulthood (Clapper et al., 1995; Warner et al., 2007).

Many of the measures of alcohol use are self-reported either by parents, target children/adolescents or siblings. All self-report data is subject to social desirability and/or recall bias. In the case of adolescent alcohol reporting this social desirability bias may lead to under–reporting (if the adolescent perceives they may get in to trouble or be seen as "delinquent") or over-reporting (in order to be seen as "cool" amongst the peer group). In addition, some reports of sibling alcohol use are made by the target adolescent and reflect *perceptions* of use as opposed to actual use. Target adolescents' perceptions of sibling alcohol use are inappropriate as the more alcohol younger siblings perceive their older sibling to drink, the more alcohol they themselves are likely to consume (D'Amico & Fromme, 1997). Non-independent measures of alcohol use are misleading as they do not reflect the true patterns of drinking by siblings. It would be preferable to include collateral reports of adolescent alcohol use from another source such as friends or siblings. Parents are not suitable sources of validating adolescent alcohol use because they often inaccurately estimate their children's alcohol use, in either direction (Engels et al., 2007).

Measures of alcohol use are not consistent across studies. For example, measures range from "having drunk alcohol at anytime" (Maes et al., 1999) to "how often have you drunk alcohol" (using six or eight response categories) (Fagan & Najman, 2005; Poelen

et al., 2007b) to "how many times in the last three months have you…" (Gerrard et al., 1999) "Have any of your brothers or sisters ever drunk alcohol…" (Bahr et al., 2005). In addition, some studies provide inadequate details of how alcohol consumption was measured (e.g. Vakalahi, 2002 asked "On how many occasions (if any) have you had beer, wine, or hard liquor to drink in your lifetime?"). Measures of alcohol consumption are important. Secondary data analysis from the NDSHS indicate that despite the use of validated tools for measurement of alcohol consumption, some methods are more likely to yield results that promote under-reporting of alcohol consumption (Stockwell, Zhao, Chikritzhs, & Greenfield, 2008).

One of the difficulties in examining the relationship between environmental variables and alcohol use is differentiating between shared and non-shared environmental influences (Hopfer et al., 2003). Shared environmental influences might include family structures, peers and neighbourhoods that are shared and it would be expected that these would influence siblings similarly. Nonshared environmental influences are generally divided into two types a) different exposures in the same setting (e.g. a different teacher in the same school) or b) different interpretations of the same experience (e.g. one child might reject any alcohol use as a result of parental alcohol use while a sibling may react by experimenting with alcohol). While the environment might be shared (e.g. exposure to parental alcohol use) the inferred influence on the child's alcohol use might be nonshared. Lack of clarity in these distinctions may alter estimates of variance due to shared environmental factors. Further research needs to take this into account by ensuring that shared and nonshared environmental variables are clearly defined.

9.2 Study design

There continues to be a dearth of longitudinal data and an over-reliance on cross-sectional studies, mainly conducted in the United States. As adolescent boys appear to be less easily influenced by parents, it may be particularly important to identify high risk boys early in their development, and to target these early interventions appropriately. Given that social norms around male drinking external to the family appear to have such a great impact on males, it is also important that social campaigns specifically target the accepted norms for male consumption patterns. Large, longitudinal studies focusing on Australian adolescents, and including the implications of gender differences and interactions with parental, peer and community/academic influences are needed as a matter of priority.

A further significant ongoing methodological limitation in the literature is the over-representation of studies examining college cohorts and their parents. Even within already-biased samples such as these, response patterns would suggest that skewed samples of parent-child dyads are achieved (Abar & Turrisi, 2008), thus the views of more marginalised young people and their parents are not captured. In addition, many of the studies on the role of sibling influences in adolescent alcohol use utilise twin pairs from alcohol and other drug treatment centres and/or have small samples. The subsequent

lack of statistical power and poor generalisability of these studies means the results should be interpreted with caution.

Future research needs to include Aboriginal and Torres Strait Islander populations. The role of Indigenous parents and siblings in influencing children's and adolescents' alcohol use is poorly understood. Culturally appropriate research that takes into account specific ethnicl and social norms is a priority.

It is particularly difficult to study large samples of youth as they are typically not "congregated" in one place, such as schools. Studies of adjudicated youth are typically less methodologically rigorous, being more open to sources of bias that are difficult for researchers to control (e.g. small n, high attrition, and heterogeneity). This is problematic is a number of ways, not least of which because these are the young people who may experience higher rates of comorbid mental health problems, academic under-achievement, and early school departure – all of which conspire to make them less accessible to public health messages about safe levels and patterns of alcohol consumption.

Most of the research in this area is correlational and so there cannot be any explanation of "cause and effect" relationships. While results from these studies may suggest inferences about the relationship between children's and adolescent drinking and family member influences, longitudinal data is needed to demonstrate these influences over time where other variables are taken into account. While there are some longitudinal studies that examine the influence of siblings, parents and friends simultaneously, participants' length of follow-up is relatively small (1-4 years). Given that middle childhood and adolescence are times of rapid change, longitudinal studies over longer follow-up periods are required.

Sibling measures of alcohol use and other moderating influences are typically not analysed in sufficient detail. Most studies include only a few of these variables, and this may result in an inadvertent inflation of the effect of some factors without considering the influence of other key variables. As reported by Van Der Vorst (2007), only a few studies on sibling influence accurately examined this as a bi-directional influence and tested the possible effects of moderating variables such as the quality of sibling relationships. In addition, most of the research examining sibling influence on alcohol use is cross-sectional.

Genetic influences and broader family environment factors such as parental monitoring, communication, attitudes towards alcohol and sibling alcohol use are known to influence adolescent alcohol use. However, very few studies include all of these variables, or control for them in their analysis. Hence the actual strength of any particular parental or sibling association with adolescent or children's drinking may be reduced when these other variables are considered. Longitudinal research that includes collaborating, validated reports of alcohol use from parents, siblings and children/adolescents is needed.

10. Conclusion

For adolescents, the most accurate indicator of future alcohol use is current alcohol consumption patterns (Viner & Taylor, 2007). Current alcohol consumption, age and sex are better predictors of later-life regular drinking than are measures of social influence (Ary et al., 1993; Poelen et al., 2007b). That is, social influences on future drinking patterns are mediated by current alcohol use. Community-based comprehensive interventions that focus on the broader social context may be more effective than solely focusing on the drinking behaviour of parents and siblings.

There is evidence that parents have an influence on children's and adolescents' alcohol use via the quality of the parent-child relationship, generic parental behaviours, role modelling and the use of alcohol specific rules. While a number of studies have identified links between sibling behaviours and adolescent alcohol use, many of these employed cross-sectional designs and their findings may reflect shared environmental influences and not mutual influence processes *per se*.

Interventions directed at parents are more likely to influence more than one adolescent. That is parents may influence each of their children and have an influence on their children's friends. This in turn may alter the influence of peers and negative sibling modelling. Interventions that focus on the influencing role of parents are likely to be more effective in reducing adolescent alcohol use than those which focus on siblings.

There is insufficient longitudinal evidence on the role of siblings in relation to adolescent alcohol use to provide recommendations for policy or practice. There is a need for systematic review methodology and longitudinal research, in the Australian context, to explore the bi-directional influence of sibling alcohol use in relation to influence of parental, sibling, friend and familial environmental factors simultaneously. While cross-sectional studies identify a positive correlation with family member drinking patterns, longitudinal analyses suggest that the influence of family members and friends only explains a very small part of the variance associated with offspring drinking patterns.

11. Further research

While there are gaps in the Australian research in relation to the use of alcohol by children and adolescents, there is also a wealth of research on effective interventions that have not been implemented. Funds for further research should be directed towards methodologically rigorous work that addresses variables that can be manipulated. That is, further research should be linked to variables that have been clearly demonstrated to have a quantifiable effect on children's and adolescent's alcohol use and experience of alcohol-related harms.

11.1 Areas exhausted in current research

There is a wealth of existing data and established surveys on the use of alcohol by Australian adults and adolescents. The larger surveys such as the NDSHS and the ASSAD survey are methodologically rigorous and provide extensive evidence about the drinking patterns of these groups.

There is also clear evidence on the effectiveness (both cost-effectiveness and impact on DALYs) of broader social interventions to reduce the burden of alcohol-related harm on the Australian community.

There are a number of Australian studies on the implementation and effectiveness of school-based education programs aimed at reducing alcohol mis/use amongst Australian children and adolescents. Any further research in this area should only be directed towards the evaluation of existing programs where evaluation data is not currently available.

11.2 Gaps in existing research

Longitudinal and intervention studies are critical in terms of understanding family dynamics and influences over time. While cross-sectional research provides insights into potential correlations, longitudinal data can explore relationships between variables that lead to a greater understanding of causal mechanisms in outcomes. For example, cross-sectional studies suggest that peers are an important influence on adolescent alcohol use. However, over longer periods, these effects appear to diminish. What needs to be explored is the broader context of family environmental and developmental variables and how these influence children's and adolescents' alcohol use. There is a need for longitudinal Australian research into the effect of alcohol consumption in childhood and the relationship between children's and adolescents' (including siblings') attitudes toward and use of alcohol, family dynamics and structure and the broader environmental influences. In particular, the following two areas are priorities for descriptive research in the Australian setting. Both of these priorities could be explored in the same longitudinal research study.

11.2.1 The Relationship Between Alcohol Use in Childhood and Alcohol Use in Adolescence

There is a need for Australian longitudinal research into the relationship between alcohol use in early childhood and subsequent use of alcohol in adolescence. In order to understand the relationship between sips of alcohol in early childhood and alcohol use in adult life, the data would need to be collected from early childhood to mid adolescence. There is currently substantial evidence that suggests that drinking habits in adolescence predict regular drinking in later life (Bonomo et al., 2004; Viner & Taylor, 2007). However information about the role that alcohol plays in the lives of pre-pubescent

children is lacking. Hence, if data were collected from early childhood to mid-adolescence, this would provide a more complete "picture" of the adolescent drinker which would facilitate prediction of subsequent drinking patterns in adulthood.

11.2.2 The influence of parental, sibling, friend and familial environmental factors on children's and adolescent's alcohol use

There is a need to review the existing evidence on the role of siblings in relation to adolescent alcohol use using systematic review methodology. This would provide a basis for further longitudinal research in this area. Only a few overseas studies have examined the influence of sibling, friend, parental and familial environmental factors simultaneously. While a number of studies have identified a link between sibling alcohol use and that of adolescents, there is a dearth of longitudinal data that explores this relationship in the broader context of family members, friends and other social environments.

11.2.3 Intervention research

While results from descriptive research indicate that parental drinking influences alcohol use by children and adolescents, there is a need for rigorous research to explore the effectiveness of interventions aimed at parental attitudes, beliefs, and behaviours in reducing children's and adolescents' alcohol (mis)use.

11.2.4 Indigenous populations

There is a dearth of research on the role of family members in children's and adolescents' alcohol use in Australian Indigenous families, yet we know that Indigenous young people are significantly over-represented in substance abuse and youth justice statistics. Priority needs to be given to exploring the role of parents and siblings in Indigenous settings in a way that is culturally sensitive and likely to result in meaningful interventions that are acceptable to the end-users.

11.2.5 Methodological considerations in future research

Further research in Australian settings should focus on longitudinal designs and quality randomised controlled trials of interventions. Validated tools that measure alcohol use in children need to be developed, but as a minimum, existing validated measures of alcohol use amongst adolescents should be used.

It would be preferable to not solely rely on self-report measures of alcohol use by adolescents. Instead, collateral reports of adolescent alcohol use from other sources including friends or siblings need to be considered.

11.2.6 Linking with current longitudinal studies

The Longitudinal Study of Australian Children (LSAC) and the Footprints in Time: Longitudinal Study of Indigenous Children (LSIC) are two studies that may have relevance for the subsequent empirical research phase of this project.

The LSAC study is useful in terms of contemporary currency, relevance and measures. The lead agency for LSAC study is The Australian Institute of Family Studies, and at this time, it is proposed that the study will follow children for at least 7 years. The study uses a holistic approach to child development and includes a nationally representative sample of 10,000 children in selected age ranges.

Data being collected, using a range of validated measurement tools, in the study includes:

a. Core socio-demographic measures including family and social constructs
b. Children's development and functioning
c. Family functioning (including parenting practices, child-parent relationships an stress)
d. Child and parental health (including parental alcohol consumption)
e. Child-care
f. Education

Alcohol consumption in early childhood has not been measured and at this time, it is proposed that these measures will not commence until 2012. In addition, the sample only includes one child per family and so measures of sibling influence on children's alcohol use will not be possible.

While it would be convenient to link with the LSAC study to examine the role of family members on children's and adolescents' alcohol use, the study does not include adequate measures of alcohol use by children and their siblings. At this time, there are no other active longitudinal Australian studies that would answer these research questions.

The Footprints in Time (Longitudinal Study of Indigenous Children; LSIC), undertaken by the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA), is collecting information in relation to Aboriginal and Torres Strait Islander children in the following relevant areas
:

a. Health
b. Culture
c. Education
d. Housing
e. Family relationships

Wave 1 of data collection began in April 2008 and included 1,800 interviews with a parent or primary caregiver of Aboriginal and Torres Strait Islander children.

12. Implications for practice

The implementation of multiple policies to reduce alcohol-related harm is more effective than reliance on one strategy. There is substantial evidence that regulatory interventions are effective in reducing the use and misuse of alcohol by young people. It is within this context that efforts to change parental and sibling influences on children's and adolescent alcohol mis/use should be focused. Policy makers and service providers need to consider and where possible address the social, environmental and economic factors that affect parents' (and to a lesser extent siblings') ability to change their behaviour.

Unfortunately, many parents seem to consider that their efforts at monitoring their children have little influence against the broader social and environmental influences that contribute to alcohol use by children and adolescents. Parental efforts to practice monitoring need to be supported with a broader environmental strategy to restrict the access and supply of alcohol to minors, thereby enforcing the current NHMRC guidelines in relation to the use of alcohol by children and adolescents.

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