



UNIVERSITY
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How does relevant theory inform a public alcohol policy model?

by

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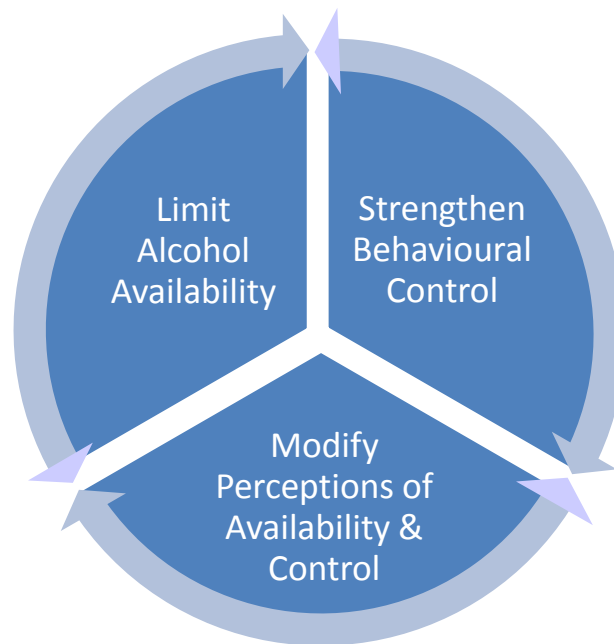
Abstract

This thesis investigates the problems associated with alcohol and solutions to these concerns through a theory based alcohol policy model. Public alcohol policy is challenging to frame in Australia in the context of the policy environment, unclear government agendas, shifting governance structures, and the influence of the alcohol industry on policy direction. To add to these complexities, the current National Alcohol Strategy has done little to reduce the extent and severity of alcohol related harms. A sociocultural focus dominates the Strategy within, predominantly, a harm reduction approach. This emphasis has resulted in issues such as alcohol availability, aggregate consumption and drinker control being inconsistently addressed in strategic actions. In the wake of these omissions, policy advancement is a pressing concern. The thesis determines a way forward for alcohol policy in Australia by analysing research related to alcohol availability and drinker behaviour. Gaps are apparent in the literature. Evidence of an ordered approach to policy development is lacking and relevant theory is not referred to for an alcohol policy model.

To inform a model for public alcohol policy, an appeal to theory is made. Analysis of population theory and behavioural theory is conducted against key indicators of alcohol associated risk. An integrated approach to alcohol problems and their policy solutions is sought. *Availability Theory* and the *Theory of Planned Behaviour* emerge as theories of relevance to alcohol outcomes and alcohol policy. The thesis demonstrates that limiting actual availability and modifying perceived availability are effective ways to lessen population consumption and harms. The importance of strengthening actual behavioural control and modifying perceived behavioural control is likewise confirmed. The thesis establishes the benefits of analysing and applying relevant theory to alcohol policy development. Results of the investigation are presented in a public alcohol policy model.

The ‘PRACTISE’ Model is the definitive contribution of this thesis to the alcohol research and public policy fields.

Figure 1: The ‘PRACTISE’ Model



The Policy ‘Risk appraisal’ of Availability and Control to Increase Strategic Effectiveness (PRACTISE) Model is comprised of a number of components. The Model incorporates the policy aims of limited alcohol availability and stronger behavioural control. Also acknowledged in the Model are the contributions of perceived alcohol availability and perceived behavioural control to the prevention of risk from consumption. The ‘PRACTISE’ Model is a theory based framework and practical way for governments and communities to confront alcohol related harms. A number of *Principles* are central to the Model, as is a *Policy Risk Index*. The ‘PRACTISE’ Model, as a scaffold for conceptualising alcohol related risk, informs interventions associated with alcohol. A suite of aims, objectives, goals and strategies support the Model. The Model is a strategic

planning tool for policy makers as well as a guide for field practitioners, and is suitable for implementation at national, jurisdictional and community levels. The Model does not contain all the answers; that would be difficult with alcohol. What is provided is a systematic way to achieve more acceptable levels of risk, in order to prevent alcohol associated harms.

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Chapter 1: Introduction

1.1 Thesis Rationale

There is a significant and pressing need for a change to alcohol policy in Australia.

Despite the formulation of successive alcohol policies for more than two decades, health, psychological and social harms, as well as costs from alcohol, persist (Collins & Lapsley 1996, 2002, 2008; English et al. 1995; Loxley et al. 2004; National Health and Medical Research Council 2009; National Preventative Health Taskforce 2008; Ridolfo & Stevenson 2001). Approximately one third of drinkers are at risk of short term harm, and one fifth of drinkers are at risk of harm in the longer term (Australian Institute of Health and Welfare 2011). Compounding these problems, sixty-two percent of the volume of alcohol consumed places drinkers at risk of acute harms, and forty-four percent results in risk of chronic harms (Chikritzhs et al. 2003).

These vital policy agendas do not currently receive the government attention they deserve. The National Alcohol Strategy (National Drug Strategy 2006), as the primary alcohol policy for Australia, has made little progress in reducing alcohol harms, despite the Ministerial Council on Drug Strategy extending the original timeframe from 2009 to 2012. The aim of the current Strategy, to achieve cultural change, lacks the necessary rigour for a national policy approach. According to some, a sociocultural frame for alcohol policy results in an unintentional increase in availability and consumption (Hawks 1989), with an inevitable increase in harms to follow. A concentrated focus on drinking culture could lead to loss of control on the part of drinkers, due to a lack of focus on alcohol availability and consumption levels. A way of alleviating this situation needs to be found.

Links between fluctuations in availability and fluctuations in consumption are not often investigated. Models of consumer response to alcohol availability are not an active

research concern (Gruenewald & Treno 2000). The reasons for this paucity are difficult to determine, except to propose that policy requires a thorough understanding of available evidence and a way to organise and apply research findings. This thesis asks if relevant theory can provide knowledge for alcohol policy alongside other available evidence, and whether reference to theory offers a more effective approach in the current policy environment. It is proposed that an investigation of theory could clarify the environmental influences on drinking choice and convince governments of the need for public policy change. Reference to theory could determine how decisions are made regarding alcohol consumption and how these learnings can transform the public alcohol policy debate. Theory could help with the organisation of evidence for policy and the systematising of policy agendas; application of theory could inform the framing of policy as well as the development of a public alcohol policy model.

A number of theories are analysed for their relevance to alcohol use and alcohol policy. Two theories are a focus of the investigation: Availability Theory (AT), a population theory (Bruun et al. 1975); and the Theory of Planned Behaviour (TPB), a behavioural theory (Ajzen 1991; Ajzen & Madden 1986). AT clarifies the influence of alcohol availability on population level consumption and harms. For Australia, these relationships are reflected in the rise and fall of alcohol associated deaths and road fatalities when compared with fluctuations in annual per capita consumption (Chikritzhs et al. 2003). The TPB is reliable in predicting outcomes at the behavioural level. The theory clarifies the intentions and motivations preceding consumption and explains perceived behavioural control as a significant predictor of alcohol related actions.

A challenge for this thesis lies in the juxtaposition of a population theory with a behavioural theory in relation to public alcohol policy and a public alcohol policy model.

These concerns are allayed when investigative findings are applied to alcohol risk environments and alcohol policy direction. Each theory explains the circumstances leading to alcohol consumption and provides valuable insights into changing drinkers' behaviour. Both theories are reliable in predicting alcohol outcomes. Each demonstrates strong explanatory power and shows potential to contribute to public alcohol policy. The possibility of basing population level strategies on AT (Bruun et al. 1975) and those for subpopulations at risk on the TPB (Ajzen 1991; Ajzen & Madden 1986) is explored. Public alcohol policy is argued to be able to accommodate crucial elements of the theories of focus. As such, the two theories form central tenets of this thesis.

Establishing the links between theory and policy enables a fresh approach to the prevention of alcohol harms. AT (Bruun et al. 1975) and the TPB (Ajzen 1991; Ajzen & Madden 1986) provide insights for alcohol policy framing. The propitious nature of theory based evidence could assist governments struggling with alcohol problems yet enable fiscal benefits to emanate from supply. The development of a public alcohol policy model, to structure and integrate disparate policy agendas, is the culmination of this thesis. As such, this thesis investigates the strengths, weaknesses, consistencies, and variations that are associated with AT and TPB and establishes each theory's potential in matters of alcohol policy relevance. Other theories are canvassed to the extent they challenge or bring further understanding to the theoretical and practical aspects of the task. The methods employed establish the most important variables to apply to alcohol policy and enable greater predictability of policy outcomes. The rationale for this thesis is afforded support by the proposition that alcohol policy be informed by theory, and the interactions between availability, consumption and harms are further investigated (Stockwell & Gruenewald 2001).

1.2 Thesis Aims

This thesis has a number of primary aims. It seeks to determine how relevant theory can enlighten the framing, structure and implementation of alcohol policy, and thereby inform a public alcohol policy model. The identification of key theories, relevant to alcohol outcomes and alcohol policy, is pursued. Analysis of population level theory is undertaken to clarify the environmental context of alcohol use. Analysis of behavioural theory is undertaken to explain the behavioural attributes of alcohol consumption. The integration of population theory with behavioural theory is pursued to conceptualise alcohol risk and inform alcohol policy. Also explored are the likely outcomes of excessive public policy approaches to alcohol. In contrast, a balanced alcohol policy framework is developed to counter the risks from the legal availability of alcohol with drinkers' stronger behavioural control. The public alcohol policy model so formed aspires to practical application. This is achieved through the development of goals and strategies for implementation purposes, based on relevant findings. Population theory and behavioural theory are essential to the aims of this thesis, the public alcohol policy model here developed, and the interventions described for the alcohol risk and harms milieu.

1.3 Scope and Assumptions

An important assumption, crucial to the thesis direction, is that alcohol is 'no ordinary commodity', but one with far reaching physiological, psychological and social consequences (Babor et al. 2003; Babor et al. 2010). The emphasis in national alcohol policy on sociocultural change within a harm reduction framework does not afford this stance (National Drug Strategy 2006). Harm reduction, in the narrowest sense, seeks to reduce the consequences of use without necessarily limiting supply or reducing consumption. This philosophy represents an unreliable policy mantra for a legally

available product like alcohol. With alcohol, more overt regulation and control by governments is certainly possible than occurs at present. The sociocultural aspects of alcohol use are secondary in effect when compared with the physiological and psychological changes evident for drinkers (Jernigan et al. 2000; Julien 1995; World Health Organization 2007b). Supply reduction and demand reduction are crucial if alcohol harms are to be reduced, consistent with *harm minimisation* (Lenton & Single 1998) and supported by this thesis.

Further, political pressures result in compromise of alcohol policy and strategic intervention. The jurisdiction of National Competition Policy over alcohol (National Competition Council 1995) limits alcohol policy effectiveness. Economic benefits for government thwart a policy solution that would reduce both supply and demand. Pressures stem from the alcohol industry in policy consultation processes (Babor, Edwards & Stockwell 1996; Cook 2005; Hawks 1993; Miller et al. 2009; Stockwell 2007). Unclear policy direction is an inevitable result. Also acknowledged are the inherent difficulties in negotiating public alcohol policy within political agendas, together with the challenge of achieving sustainable environmental change. In order to contest these circumstances, alternate public alcohol policy needs to be developed for Australia.

It is proposed in this thesis to improve public alcohol policy through application of relevant theory alongside other reliable evidence. Analysing the evidence for the environmental context of use and the attributes of consumption behaviour ought to provide a clearer policy perspective. Systematising the evidence to improve understanding and increase utility could prove a valuable quest. Population and behavioural theories explain the risk environment and predict drinking outcomes. The theories of focus provide additional capacity to disentangle cause and effect and help clarify the complex

associations between availability as supply on the one hand, and consumption as demand on the other.

The foreshadowing by AT (Bruun et al. 1975) of increased harms from increased availability and consumption shows potential for policy application. The predictive elements of the TPB (Ajzen 1991; Ajzen & Madden 1986) for alcohol use and drinking behaviours are likewise important to policy. Based on these assumptions, the thesis engages with AT and the TPB and integrates findings into a public alcohol policy model that frames alcohol policy and prioritises strategic intervention. In support of exploring the descriptive elements of theory, the lack of predictive power in social research is noted (Pawson 2006). It is within this academic gap that the current investigation seeks to focus.

1.4 Thesis Questions

This thesis provides answers to the following questions:

Central Research Question

- *How does relevant theory inform a public alcohol policy model?*

Subsidiary Questions

- *What are the most relevant theories to public alcohol policy?*
- *How does population level theory inform public alcohol policy?*
- *Which variables of population level theory reliably predict the alcohol use environment and alcohol related risk?*
- *How does behavioural theory inform public alcohol policy?*
- *Which variables of behavioural theory reliably predict the attributes of consumption and alcohol related risk?*

- *How does population theory together with behavioural theory, inform the alcohol risk environment and drinking behaviours?*
- *Can a public alcohol policy model be formed from population theory and behavioural theory?*
- *How do other theories complement the model?*

1.5 Thesis Methodology

This thesis inquires how relevant theory informs public alcohol policy and a public alcohol policy model for Australia. To answer this central research question, a number of methods are utilised.

First, discourse explores the context of alcohol policy in Australia. The challenge of making effective public alcohol policy is discussed, together with the place of alcohol in Australian society. Deficiencies in current national alcohol policy are emphasised, leading to the inquiry of a better policy framework and improved policy outcomes.

Second, a literature review is conducted to examine the extent of problems associated with alcohol and likely policy solutions. Research related to health, epidemiological, social, behavioural, policy, and theoretical perspectives is searched. The *environmental context of alcohol use* and the *behavioural attributes of consumption* are prominent features in the literature analysis. Gaps in current research are identified; these inform the direction of the thesis.

Third, the theories most relevant to alcohol policy are investigated. A vital part of this stage of the inquiry is to determine the extent to which these theories could progress the alcohol policy agenda. Key theories are selected and analysed according to chosen criteria. Analysis of significant theories proceeds in two categories: *Population Theory*

and the Environmental Context of Alcohol Use – within the perspective of ‘supply’, ‘demand’ and ‘harms’ components of harm minimisation; and *Behavioural Theory and the Attributes of Consumption* – as the control factors, motivations, expectancies and perceptions that influence ‘demand’ and ‘harms’.

Fourth, analysis and synthesis of research for alcohol policy forms the primary focus of this section. Population level relationships explained by Availability Theory (AT), a theory of focus, are investigated to understand alcohol outcomes and inform alcohol policy. In *Stage One*, the connections between availability, consumption and harms at the population level are examined through analysis of population studies from a number of countries. Two categories are formed for the analysis: *Review of Aggregate Studies*; and *Aggregate Studies Reporting on Relationships between Consumption and Harms at the Population Level*. Research related to situational availability is then examined. This is undertaken to establish the links between availability, consumption, and harms in community environments and local settings. In *Stage Two*, perceived availability, a significant indicator of alcohol use, is analysed.

Fifth, analysis and synthesis of research for alcohol policy is the method adopted for this stage of the inquiry. Studies applying the Theory of Planned Behaviour (TPB), a theory of focus, to general behaviours and alcohol specific behaviours are investigated to understand alcohol related actions and inform alcohol focused policy. In *Stage One*, three categories are formed for the analysis: *General Behavioural Studies*; *Studies of Alcohol Specific Behaviours*; and *Behavioural Change Interventions*. In *Stage Two*, the relative contributions of key variables of the TPB are determined through further investigation of the research analysed in *Stage One*.

Sixth, comparative analysis forms a significant part of the methods of this section. Results of the analysis of AT and the TPB are combined to engender a number of theoretical perspectives on alcohol associated risk and alcohol related policy. Relationships between *actual alcohol availability*, *perceived alcohol availability*, *actual behavioural control*, and *perceived behavioural control* are explored.

Seventh, findings from the analysis of theory are applied to public alcohol policy. The concept of a continuum of alcohol associated risk is discussed in preparation for the development of a public alcohol policy model. Significant variables of the theories of focus are integrated to demonstrate the benefits of limited alcohol availability and stronger behavioural control. Indicators of risk are assessed for the insights they confer to public alcohol policy. The *Policy 'Risk appraisal' of Availability and Control to Improve Strategic Effectiveness*, or 'PRACTISE' Model, is developed, incorporating key concepts of the theories of focus. Also presented is a diagrammatic representation of the 'PRACTISE' Model.

Eighth, discourse is the method undertaken to explore the opportunities and challenges associated with the 'PRACTISE' Model. Discussed are: what the Model offers as innovation for alcohol policy; how the Model could transform current alcohol policy for Australia; the circumstances necessary to support the successful introduction of the Model; and how success of the Model is to be determined. The contribution of relevant theory to public alcohol policy is further discussed.

Ninth, discourse confirms the underlying thesis assumption that 'relevant theory *can* inform a public alcohol policy model'. Discussion occurs regarding the primary outcomes and unique contributions of this thesis, together with the strengths, limitations and

implications of the investigation. Recommendations for future research are proposed, including the further development of theory to inform public alcohol policy.

1.6 Research Significance

This research is timely. Societal harms from alcohol are substantial at international and national levels and are not expected to reduce significantly in the immediate future. Harms and costs from alcohol are evident in Australia, where a sociocultural focus is prominent within a harm reduction policy framework. A proportion of these costs is incurred through policy development and implementation processes. Financial and human losses occur from ineffectual policy that fails to deliver a desirable level of environmental change. Reduction in the burden of unsuccessful policy could be possible from the thesis findings, where a systematic approach to policy development is demonstrated and an alcohol policy model is presented.

This thesis has potential to contribute to alcohol policy discourse, impact on the processes underpinning policy development, and change public alcohol policy direction. A significant contribution of the thesis is the systematic application of theory to the risk and harms that ensue from alcohol. The investigation of theory to inform the alcohol risk environment and alcohol consumption behaviours has not been undertaken previously. The culmination of this thesis, as a public alcohol policy model for Australia, symbolises a new era of alcohol policy investigation. As such, this thesis represents a unique contribution to the public policy and alcohol research fields.

1.7 Thesis Outline

The thesis comprises a number of chapters consistent with emerging themes of the investigation. *Chapter Two* provides an introduction to the inquiry within an alcohol policy context. *Chapter Three* investigates the literature relevant to the primary questions of the thesis.

Chapter Four commences the exploration of theory for alcohol outcomes and alcohol policy. *Chapter Five* undertakes an analysis of AT for alcohol policy. *Chapter Six* continues the investigation of theory for alcohol policy through analysis of the TPB.

Chapter Seven integrates findings from analysis of AT and the TPB in preparation for development of a public alcohol policy model. *Chapter Eight* discusses the concept of a continuum of risk for alcohol policy and strategic practice. The ‘PRACTISE’ Model is formed. *Chapter Nine* explores the political and policy opportunities and challenges that would accompany the implementation of the ‘PRACTISE’ Model.

Chapter Ten integrates the various components of the thesis and draws the inquiry to a conclusion. The contribution of theory to an alcohol policy model is confirmed. The implications of thesis findings for future alcohol policy and opportunities for further alcohol related research are discussed.

Chapter 2: Australia's Alcohol Policy Context

2.1 Introduction

Public alcohol policy presents a dilemma. Alcohol, as a legal commodity, is manufactured, traded, sold and consumed in a majority of countries, including Australia (World Health Organization 2007b). An extensive range of alcohol products is universally available. The beverage is enjoyed in private homes and public places (Australian Institute of Health and Welfare 2008, 2011); celebratory, sporting and other communal events regularly involve use. Yet, alcohol causes immeasurable harms to communities and societies. "The damage caused by consumption of alcohol is closely related to the level of consumption of both individuals and populations" (World Health Organization 2007b, p. 2).

National alcohol policy for Australia is less than successful in addressing availability and limiting use of this legal product. Alcohol associated harms are prevalent in this country (Australian Institute of Health and Welfare 2011; National Preventative Health Taskforce 2008), and extend to Indigenous settlements in outback communities (Martin 1998; Nicholas 2007; The Drug and Alcohol Office Western Australia & the University of Notre Dame Australia Broome Campus 2010). The Australian Government could employ reliable means, such as legislation, taxation and other policy levers to limit supply, reduce consumption, and minimise harmful effects (Babor et al. 2003; Babor et al. 2010; Loxley et al. 2004). Yet, evidenced strategies are not systematically applied by all governments, despite the fiscal, health and social advantages to be gained from doing so. Limited adoption of the key recommendations of the National Preventative Health Taskforce on alcohol is cause for additional concern (Daube 2010).

Insufficient reliance on evidence results in ready access to alcohol and risky drinking for much of the population (Australian Institute of Health and Welfare 2011; Chikritzhs et al. 2003; Chikritzhs, Whetton, et al. 2010; National Health and Medical Research Council 2009). Further, drinker control is not subject to attention in alcohol policy discourse. A significant cause of limited policy success is the jurisdiction of the National Competition Policy (NCP) over alcohol; the NCP ensures the viability and competitiveness of business enterprise, irrespective of the harms associated with consumption (National Competition Council 1995). The ineffectiveness of public alcohol policy is also due to alcohol industry efforts to ensure ongoing availability of alcoholic products. The industry presents a challenge to the public health position of alcohol as a problematic beverage (Room, Babor & Rehm 2005). Other causes of deficient alcohol policy include the lack of an organised approach to the analysis of evidence, and the usual competition of agendas for political attention and government resolution.

2.2 Public Alcohol Policy Challenges

2.2.1 Political and Policy Processes

Alcohol policy is difficult to formulate. Public policy is affected by complex systems that support political and societal organisation. Some of these influences are by no means consistent with strong alcohol policy that would reduce availability, consumption and harms. Approaches contrary to creating safer drinking environments come from broad government strategies that aim to achieve growth, innovation and rising productivity through open market competition. In Australia, alcohol is protected by the NCP (National Competition Council 1995), making it a difficult product to manage within a public health reform agenda. Alcohol forms part of the Consumer Price Index and is thought of as an 'ordinary' household commodity.

The political and economic environments surrounding alcohol are of benefit to business and hospitality, but not to health and social policy. Alcohol sales and consumption are part of the economy of nations (World Health Organization 2007b), and any large drop in the availability of alcohol would be met with political and business opposition. Political pressures on otherwise strong public policy increase the complexity of achieving large policy gains in short periods of time. Alcohol policy is fraught with challenge similar to the public health and social concerns surrounding food and tobacco products (Daube 2010). Community opinion can likewise affect the success of public policy; a sound alcohol policy can fail as a result. These circumstances require challenge from public health organisations and interests to undo the harms that prevail from alcohol and ensure alcohol is treated as an 'extraordinary' commodity (Babor et al. 2003; Babor et al. 2010).

Achieving an agreed alcohol policy position is a highly competitive process involving political, policy and industry players. The criterion for determining good policy is continually being contested and revised (Swerisson 1998). Effective public alcohol policy not only addresses availability, but also takes into account the capacity of a population to cope with a particular level of access. Public alcohol policy should influence the environmental context of use and the behavioural attributes of consumption; the loss of control of at risk drinkers is crucial in this regard. Taking these matters into account, an improved public alcohol policy for Australia could be possible.

But, within federal and state environments, there is no straightforward or universal way to achieve the best alcohol policy outcomes for Australia. The issues that ultimately make the political agenda, and how well these problems are dealt with, are hard to predict. The world of public policy making is complex (Kingdon 1995); these difficulties extend to alcohol. Good results are not inevitable; public policy can produce unpredictable results,

irrespective of a reliable evidence base. A rigorous alcohol policy approach considers how evidence for policy is used and how policy decision making occurs (World Health Organization 2007b). Notwithstanding, there is ongoing contention between policy players as to the primary cause of alcohol harms and the focus of alcohol policy. For these reasons, the framing and structure of future public alcohol policy for Australia is crucial, as are the strategies chosen for action.

There are a number of ways to explain policy, including policy related to alcohol. Definitions highlight the commonalities and differences evident with policy and the various processes that support policy development. Policy is described as dynamic and structured action to achieve a stated or understood purpose, and as political decisions and their consequences (Bridgman & Davis 1998). Policy is also referred to as a blueprint or plan of activities, a list of issues that are relevant to a particular public agenda (Dalton et al. 1996). Policy is considered as a negotiated set of outcomes, within diffuse interests and an indeterminate number of variables (Lin & Gibson 2003). Consistent with these descriptions, policy can be construed as a social mechanism for change.

Irrespective of the prevailing definition adopted for policy, the making of public policy is primarily a political task. Policy making, including that related to alcohol, is dependent upon the employment of power by those involved in policy development processes (Lewis 2009); policy and politics are closely related concepts (Freiberg & Carson 2009). Viewed within a political context, advancement of a particular policy objective is largely due to the confluence of three streams: ‘policy recognition’ where an issue gets on the policy agenda; ‘policy stream’ when particular approaches to the issue are contested; and ‘political stream’ acknowledging outside influences on a specific policy position (Kingdon 1995). As an Australian example, the Living with Alcohol Program (LWAP) owes much of its

success to an alignment of political, business and policy influences, and a strong evidence base for policy direction (d'Abbs 2004). Community concern regarding alcohol and road safety issues, the concurrent release of low alcohol beverages, and the political will on the part of government to challenge alcohol harms, all coalesced for policy advancement.

Moreover, policy achievement depends on the systems and sequences that support policy development. The cyclic nature of alcohol policy in Australia can convey a sense of order to a potentially disordered process and promise beneficial change from a new policy iteration. Some authors suggest the stages of the policy cycle are highly important (Bridgman & Davis 1998). Others stress the value of social capital and stakeholder engagement in a successful policy passage (Hardaker, Fleming & Lein 2009; Winter 2000). Community tolerance for continuity or change can also influence the policy cycle. But policy is largely reliant on the government of the day and the political and social pressures that shape policy outcomes. When a change of government or government policy maker occurs, this can disrupt the course of initial policy intent and challenge successful outcomes.

Policy systems are not as organised as might be expected. Within an ideal political system, successive alcohol policies are developed and endorsed by national and state governments to achieve population level change. Politicians, policy makers, industry players, policy communities, key leaders of influence, as well as nongovernment organisations, local communities and individuals all exert pressure to achieve a preferred policy position. These processes, potentially aimed at health and social improvement, are attempted with varying levels of success. But multiple influences do not support an organised, rational, or linear course of policy development. The 'linear rational' model, as a way of envisaging public policy making, has inadequacies (Freiberg & Carson 2009). In

many situations, policy advancement takes place as ‘an unregulated chariot race of carts and horses’ (Pawson 2006).

All the same, a strong national policy process can break down at the state level (Freiberg & Carson 2009). This may be due to unforeseen circumstances, such as an unanticipated change of government or government Minister; a chance event, like a costly natural disaster; or an unanticipated challenge to a strongly entrenched policy position. As additional policy pressure, the social norms and circumstances of population groups experiencing alcohol harms can sway political agendas and, inevitably, the frame of public policy (Schneider & Ingram 1993). As an example, the advocacy of those concerned with the prevalence of Fetal Alcohol Spectrum Disorders (FASDs) has helped create momentum for change and some acknowledgment of this important policy agenda.

Experts in the alcohol policy field are generally optimistic that the next phase of policy will build on the strengths of previous iterations and overcome any serious limitations. A view prevails that policy is based on the best available evidence. This is not necessarily the case, despite the potential of evidence to improve resource allocation and health related outcomes (Redman, Stickney & Mitchell 2011). Political, social and community circumstances can prevent advancement of policy concerns and may result in the conscious avoidance of a clearly evidenced policy solution. Evaluation of past alcohol policy is generally lacking. If some form of evaluation does occur, results are not necessarily incorporated into the next policy iteration. Policy improvement does not always follow a new policy direction; policy is not always consistently developed or implemented (Pawson 2006). Neither does alcohol policy always produce the best population health outcomes for the community. Shifts in the marketplace and demands

from political players, such as the industry, account for a less than ideal policy direction (Cook 2005).

Alcohol policy presents a particular challenge for Australia; the community is accustomed to the ready availability of alcohol and drinking has become a national pastime. The ‘cultural’ context of alcohol use is largely driven by the ready access to alcohol that drinkers expect, and a willingness on the part of citizens to tolerate consumption related behaviours. However, the general public is beginning to question the place of alcohol in Australia. Almost 80% of adults surveyed believe there is a national drinking problem (Foundation for Alcohol Research & Education 2012a; Wilson 2009); this may help drive a level of policy transformation. Despite community concern, the challenge is largely political, especially in the context of competing national policy agendas and consecutive Australian Governments that have failed to successfully confront alcohol associated harms.

In the current economic environment, financing a comprehensive alcohol policy is demanding, with government revenue apportioned to a number of alcohol related agendas (Blewett et al. 2011; National Drug Strategy 2006; National Preventative Health Taskforce 2009). Evidenced policy approaches, such as limiting availability and reducing consumption (Babor et al. 2003; Babor et al. 2010; Loxley et al. 2004), can result in lost business, lost jobs, and lost revenue, presenting a risk for governments and communities as well. Despite these anomalies, public alcohol availability (Bruun et al. 1975) and drinkers’ loss of control (Heather 1995) are proposed in this thesis as the main drivers of Australia’s problems with alcohol. Until such time as alcohol is perceived as a constant threat to public health, governments will likely downplay the links between availability and harms, and continue to make alcohol more accessible and more desirable, consistent with an industry position.

2.2.2 National Alcohol Policy Governance

An opportunity for strong alcohol policy effort was passed over, due to national governance arrangements in the last decade. The pursuit of the common good through good governance is an acknowledged part of public policy development (Stanhope 2007). The functioning, in recent years, of the former Ministerial Council on Drug Strategy (MCDS) and the Intergovernmental Committee on Drugs (IGCD) is cause for concern. These committees, tasked with addressing alcohol problems at high government levels, have made little progress in changing the political and policy landscapes surrounding alcohol or reducing the prevalence of alcohol related harms. Problems partly result from the mostly select involvement of Justice, Police and Health Department representatives in these committees, with the exclusion from membership of other government entities, such as Liquor Licensing Authorities. The omission of important policy agendas, like a cap on liquor licenses and the prevention of chronic conditions related to alcohol, also contributes to a loss of relevance.

Clear governance arrangements are required in the wake of reform of the Ministerial Council System in 2011, and the Council of Australian Governments' (COAG) decision to disband the MCDS (Council of Australian Governments 2011). Anecdotal evidence suggests a drop in Ministerial attendance at MCDS in recent years, with some Ministers delegating attendance to Departmental officials. Police Commissioners' direct involvement in these committees had also waned. MCDS governance was maintained by financial and personnel support from jurisdictions, as well as meeting attendance and out of session work. These arrangements resulted in added pressure on jurisdictions without the benefits that flow from a strong national alcohol policy position. Yet, the IGCD will continue to convene and relevant Ministers will meet 'on occasions' when Ministerial level policy decisions are required (Department of Health and Ageing 2011).

Clarification of key governance responsibilities for the prevention of harms from alcohol is necessary. The absence of streamlined governance arrangements precludes a robust alcohol policy agenda. As an example, an Australian Monograph of Fetal Alcohol Spectrum Disorders (FASDs), developed following an IGCD Committee Workshop in South Australia in 2008 (IGCD Working Party on Fetal Alcohol Spectrum Disorders 2009), has still not been officially endorsed nor its recommendations progressed at a high government levels. Since that time, the Monograph has been referred from one Ministerial Committee to another with no agreement on ultimate responsibility for implementation. The Monograph has recently been released more widely. The most current government activity for this agenda involves the conduct of a House of Representative Inquiry into FASDs in 2012. This investigation takes place at considerable government expense, despite the rigorous evidence and well informed recommendations presented in the Monograph. The lack of satisfactory progress in important policy agendas, like FASDs, does much to frustrate research and policy experts ‘on the sideline’. Solutions for improved governance arrangements for alcohol need to be found.

The Commonwealth/State governance divide contributes to a weakening of strategic effort and leads to less than optimal arrangements to address the risk and harms from alcohol. In this environment, ‘turf wars’ occur over responsibilities for health service provision and health related budgets. Contentions regarding funding allocations persist. Strategic expectations are imposed by the Australian government on jurisdictions; states and territories may recognise the advantage of a national alcohol policy position, but can lack the infrastructure and resources necessary to deliver a level of change. Within a multitude of possible policy solutions, selective intervention occurs at local levels as a way of countering national expectations and reducing implementation costs.

The National Health Reform Agenda will also stifle advancement of national alcohol policy. A change in health governance and health delivery is at the core of this reorganisation. Announced in 2011, these reforms aim to restructure the provision of health related services across Australia. While the main impact of these changes applies to hospitals, the establishment of local area health organisations means an inevitable restructure of management systems and primary health care services to efficiently align with the national reform agenda. These changes will further contribute to a disjointed approach to alcohol policy, at least in the short term. Jurisdictions and communities get caught in the turmoil of policy fragmentation (Room, Babor & Rehm 2005).

In these circumstances, it is important to afford the public health community a share in governance of the alcohol prevention agenda; a public health approach is where alcohol policy effort is best directed. Alcohol represents a persistent public health problem (Room, Babor & Rehm 2005). The Australian National Preventive Health Agency, together with the Standing Council on Health convening Health Ministers, is where the primary prevention work of alcohol policy is best managed. The Australian Health Ministers Advisory Council Principal Committees of 'Australian Health Protection' and 'Community Care and Population Health' are well placed to provide expert advice to the national alcohol prevention agenda. The newly formed COAG Legislative and Governance Forum on Food Regulation, previously the Australian and New Zealand Food Regulation Ministerial Council, could continue to maintain the alcohol labelling agenda. With a number of parallel processes currently in place for alcohol in the national policy arena, the roles of these various committees require further definition. If governance dilemmas are not quickly resolved, unclear policy structures and processes will facilitate stronger industry involvement in public alcohol policy direction.

2.2.3 Industry Involvement in Public Policy Making

The most powerful of voices in the alcohol policy environment are the most influential.

Considerable advantage is conferred in the marketplace to interest groups that fulfil the following: “credible information on social conditions; available policy options and likely impacts; recurrent interactions with policy makers; large and geographically dispersed membership; group cohesion and unified positions on priority issues; organisational and electoral resources; and political intelligence and strategic position in a policy niche” (Oliver 2006, p. 208).

The alcohol industry fulfils most, if not all, of these criteria. The industry’s success in influencing the public agenda for alcohol comes from the exercise of political influence and business acumen (Babor, Edwards & Stockwell 1996; Cook 2005; Miller et al. 2009; Stockwell 2007). Industry influence is a problem acknowledged for some time (Hawks 1993). In contrast, those with limited business, political, or social standing have little impact on policy direction. The presentation of evidence for policy may have negligible effect in such circumstances; research does not always inform policy direction or government decision making (Prasser 2007). As well, competing policy positions take a toll on the uptake of evidence for policy direction and help reinforce an industry position.

Consultative arrangements can be considered to be consistent with the achievement of sound policy partnerships. Alcohol is representative of a multimillion dollar global business and is strongly embedded in the economies of a majority of countries around the world, including Australia (World Health Organization 2007b). The alcohol industry plays a primary role in production and supply for most countries and assists with microeconomic reform. The industry contributes to the Australian economy through job creation and

employment in the retail, hospitality and tourism industries. The sale of alcohol provides taxation and excise based revenue and contributes to population health through wealth creation (World Health Organization 2003). Dialogue with the industry is consistent with NCP requirements that seek to remove any barrier to an open and competitive market. Taking all this into account, the inclusion of the alcohol industry in alcohol policy development is in accord with a position of key stakeholder involvement.

By way of an alternative stance, consultation with the industry is a significant hurdle to credible public alcohol policy (Anderson 2009; Daube 2012). Alcohol industry involvement in policy direction is an ineffectual public health response (Cook 2005; Hawks 1996; Holder 2005; Osterberg 2006; Room 2005; Sengupta & Hoyle 2005). Industry influence precludes a robust policy solution. Extending the discussion further, Stockwell (2007) argues that industry should not be involved in policy decisions of ‘supply reduction’ that go against their business interests. Rather, industry involvement in alcohol policy can be limited to specific ‘harm reduction’ measures: the provision of plastic glasses at high risk venues to ameliorate the effects of violence; and ‘demand reduction’ strategies that seek to educate the general public of the risks associated with alcohol (Graham & Homel 2008; Stockwell 2007).

Ambiguous goals in alcohol policy result from alcohol industry engagement. The industry would have governments and communities believe that alcohol is an ordinary product that is used in risky ways by only a minority of drinkers. Widespread alcohol related risk and harms suggest otherwise (Australian Institute of Health and Welfare 2011; Chikritzhs et al. 2003; Chikritzhs, Whetton, et al. 2010). According to some, industry involvement and industry sympathetic policy makers contribute to a weakening of government effort and a weakening of policy success (Bakke & Endal 2010; Cook 2005). It is no wonder that

health and social policies for alcohol have failed to achieve their intended aims. As an example, the mandatory labelling of alcohol with health and pregnancy warnings has been successfully challenged by the alcohol industry, with the voluntary labelling of alcohol by producers now agreed to by government (Department of Health and Ageing 2012). The industry has been given a two year timeframe to introduce these measures. The planned industry wording is weak (DrinkWise 2012), and unlikely to have any significant effect on consumption and harms. The policy measures to be put in place by government at the end of these two years remain clouded in rhetoric.

As a position that would exclude the industry from public policy decision making, industry ethics are questioned in the mooted establishment of an industry monitoring body (Babor, Edwards & Stockwell 1996; Stockwell 2007).

In the words of McCreanor, Casswell and Hill (2000) referred to by Cook (2005), “alcohol producers are engaged in a campaign to capture the hearts and minds of alcohol researchers and public health people, as part of a major effort to win the war of ideas that shapes alcohol policy at national and international level. They are driven by the imperative for sales and profits, which is often in fundamental conflict with the public health goal of reducing hazardous drinking and alcohol related harm” (p. 1555).

Cook (2005) declares: “the common good is not served when a powerful group wields, or at least is perceived as wielding, its economic strength to service its own interests, rather than those of the whole community” (p. 1556). The concerns expressed by researchers bring to the fore the importance of an evidenced and credible national alcohol policy for the health and safety of the whole community, not one favouring the industry position. In

agreement with this position, more than fifty Australian health experts and scientists have rejected industry funding for alcohol associated research (Miller et al. 2009). This decision represents an uncompromised approach to alcohol research and alcohol policy.

2.2.4 Ethics in Public Alcohol Policy

An ethical perspective is highly desirable to achieve the best public health and social outcomes for the community (Daube 2010). Transparency and declaration of competing interests are essential for improved interventions for alcohol (Cook 2005), and to restore community trust in government policy intent. Within complex political, social and policy environments, Australians are becoming increasingly uncertain about the values that should support public policy making (Dalton et al. 1996). In addition, the Australian government appears unsure of which evidence is most reliable, where the best alcohol policy options lie, and what policy partnerships will advance the reduction of harms from use. Under these conditions, ethical alcohol policy processes are not easily achieved.

Reliance on an ethical perspective is essential to clarify the values and processes of policy development (Lin & Gibson 2003). The ethical and moral impacts of present alcohol policy, and alcohol availability in the public domain, are largely unknown. The problem of ethics is not usually proposed, nor subject to question in alcohol policy formulation. The reasons for these omissions are not easy to determine, except to suggest that alcohol policy seeks consensus based outcomes; the establishment of an ethical perspective is low on political and policy agendas. In addition, politicians have their own values and beliefs, crucial to policy success (Fleming & Holland 2002). These circumstances add to the difficulty of forming strong and ethical alcohol policy to deliver real reductions in consumption and harms.

2.3 The Global Environment

2.3.1 Consumption Estimates and Social Value

It is difficult to engender strong public alcohol policy for Australia, or in any other country for that matter, given the global prevalence of alcohol use and harms. Approximately two billion people consume alcohol worldwide, with use legally, culturally and socially established in a majority of countries (World Health Organization 2004, 2007b, 2007c). Estimates of global consumption provide a background to local data and help inform the extent and prevalence of harms from alcohol. Global annual per capita consumption is recorded by the WHO, for persons aged fifteen years and over, in litres of pure alcohol. For all years surveyed triennially between 1961 and 2000, the adult per capita consumption is recorded as 5.1 litres of pure alcohol per annum, primarily accounted for by beer, wine and spirits. Half the volume of alcohol is consumed by ten percent of the world's drinkers. More recently, global estimates of consumption increased to 6.13 litres of pure alcohol for persons aged 15 years and over (World Health Organization 2011).

Variation is apparent between countries in the level of alcohol consumption (World Health Organization 2004, 2007b, 2011) and the harms resulting from use (Skog 2001a).

Consumption is elevated in a number of low and middle income countries. Increases in consumption in some countries reflect economic growth, better purchasing power of citizens, and the active promotion of alcohol beverages by the alcohol industry. The Czech Republic records the highest annual per capita consumption of 16.45 litres of pure alcohol; Afghanistan records the lowest at 0.02 litres of pure alcohol per annum (World Health Organization 2011). Illegal and unregistered, and therefore unrecorded levels of production, account for some of the consumption and associated harms. Total bans on alcohol operate in some countries due to the presence of strict religious values and beliefs (World Health Organization 2007b).

While alcohol beverages and the problems that ensue are historically recorded over time (Room, Babor & Rehm 2005), diversity between countries is evident in the value and significance attached to alcohol (Room & Makela 2000) and the ways that alcohol is used (Room 1998). Alcohol is defined as a drug (Julien 1995), or a food related beverage (Blewett et al. 2011), and, dependent on the values attached to alcohol, rich with symbolic meaning (Babor et al. 2010). In Australia, the beverage is not generally considered as a drug; but, if these properties are acknowledged, alcohol is thought to be less harmful than other drugs. Predominant society, customs and beliefs dictate how alcohol is viewed, how alcohol policy will operate, the rules governing availability, as well as the emergence of particular drinking problems (Peel 1997; World Health Organization 2007b). Conversely, the level of availability influences the social functioning of countries and communities, and the acceptance of drinking behaviours that inevitably require policy attention.

2.3.2 Global Action and Global Policy

International approaches to alcohol influence the direction of national policy. Alcohol is a significant component of international trade agreements across the globe. Alcohol is the first psychoactive substance to be subject to international controls and the first to be removed from international restriction (Room 2006). Western nations profit from the production and trade of alcohol. The beverage is a contributor to global and local productivity (National Drug Strategy 2006) and creates wealth through employment, income, and financial gain. Free trade of alcohol across borders and boundaries is normal practice. Of note, alcohol is the only widely used and harm producing psychoactive substance not subject to an international treaty (World Health Organization 2007b).

International trade agreements are a definite threat to the development of strong public alcohol policy (Babor et al. 2003; Babor et al. 2010) and to public health interests more

generally (World Health Organization 2007b). Within an international policy context, the World Trade Organization (WTO) operates a regulatory trading framework where rules are legally binding and trade sanctions apply. When international trading disputes arise, these are overseen by tribunals of experts with little public health expertise or understanding of alcohol harms (Zeigler 2006). Public health and safety issues are rarely a consideration when solutions are sought (Edwards & Holder 2000). These circumstances present a particular challenge for alcohol policy; alcohol is well entrenched in the taxation systems and fiscal strength of western nations.

Consistent with alcohol as a threat to public health, the WHO determined a Global Alcohol Strategy was necessary (WHO Division of Prevention and Control of Non-Communicable Diseases 2009). The WHO has endorsed a number of resolutions acknowledging the public health problems attributable to alcohol (World Health Organization 2007b). These resolutions are built on the proposition that harms from alcohol relate to the level of consumption of individuals as well as whole populations, and that risk increases as consumption increases with a lack of evidence for a threshold of harms. A large proportion of consumption occurs in high risk environments, heavy drinking sessions, or both (World Health Organization 2007a).

In support of collaborative practice, the WHO conducted meetings in a number of regions in the quest for a universally endorsed alcohol policy (WHO Division of Prevention and Control of Non-Communicable Diseases 2009). Regional advice was sought from key stakeholders during public hearings. As part of this process, six WHO technical consultations were held. A global policy to reduce the harmful use of alcohol received endorsement by the WHO in May, 2010 (World Health Organization 2010). Of concern to the health and wellbeing of nations who commit to this global policy is the stated

‘balancing of interests’ there contained. Within the policy, health outcomes are a major focus, but business and development needs are also afforded attention. Recognition of industry and business as legitimate contributors to global health policy will go a long way in maintaining the industry’s ‘upper hand’ in alcohol policy negotiation. If the WHO alcohol policy direction is actioned by all WHO member states, the status of alcohol in international and local markets could be further strengthened. These circumstances will likely prevail unless a different form of balance is able to be defined in terms of the level of alcohol availability and drinkers’ behavioural response.

The public policy task for nations, caught between the agendas of a Global Alcohol Strategy and an open market economy in support of powerful alcohol interests, is substantial. The benefits that accrue to government revenue from alcohol supply and sales are acknowledged. But, as average income increases, so does alcohol consumption (Babor et al. 2010). Therefore, the harms accompanying the legitimisation of alcohol through an unrestricted market are to be heeded. Many nations, such as those in Africa and Asia, are largely untapped as market sources; the alcohol industry is well aware of the lucrative business potential (Bakke & Endal 2010). A way to temper the path of social damage from the commercial supply of alcohol needs to be found. The World Bank has set a good example by only supporting projects with strong developmental impacts consistent with public health and social concerns (World Health Organization 2007b).

Nonetheless, the International Center for Alcohol Policies (ICAP), an industry funded body based in America, matches the policy activity of WHO by engaging consultant advisors to influence the direction of global alcohol policy (International Center for Alcohol Policies 2009). Representatives of ICAP are particularly active in developing countries where a market for alcohol products is emerging. Visiting consultants from

ICAP, enjoined to present an industry position (Bakke & Endal 2010), are wedged between reflecting the wishes of the consultation meeting and promoting alcohol as an economically beneficial product. Yet, “developing countries are sceptical about the extent to which the scientific evidence derived primarily from high income countries applies to their populations and drinking countries” (Babor 2010, p. 643). In these circumstances, much sway is needed to achieve alcohol policy acceptable to the industry, and convince meeting participants that the industry has the wellbeing of nations at the centre of its cause.

Consistent with a global policy agenda, ICAP introduced the phrase *extreme drinking* into the alcohol policy vocabulary (Martinic & Measham 2008). This term proves useful in identifying high risk consumption at the farthest end of the drinking spectrum, such as defines ‘dependence’ and ‘addiction’ (American Psychiatric Association 2000). The temptation with such a label is to view all drinking that is not extreme as acceptable, and outside the need for government policy attention. Notwithstanding, fiscal benefits are a lure for those countries that embrace alcohol as a legal product and crucial part of international trade and local business arrangements, circumstances reflective of Australia’s relationship with alcohol.

2.4 The Local Use Environment

2.4.1 A Short History of Alcohol

An historical account of alcohol in Australia reveals a chequered record of access and availability (Fitzgerald & Jordon 2009), and helps provide a background to current use and current policy. Alcohol played a prominent role in the economic currency and community life of ‘New South Wales’, as the early colony was known. Alcohol was a component of government rations distributed throughout the settlement. At that time, social harms from alcohol use would have been evident, but tolerated to varying degrees. Alcohol misuse

was likely considered acceptable in the context of an unforgiving physical environment and the social difficulties of colonial establishment. Regardless of the behavioural effects, the links between alcohol use and many health harms were not fully understood. The health consequences of use were not clearly formulated or scientifically evidenced until much later.

The events of colonialism and colonisation influenced social structures, with devastating consequences for the Australian Indigenous peoples (Fitzgerald & Jordon 2009). In addition to exposure to ‘white man’s’ alcohol, there is evidence of Indigenous populations producing fermented beverages from natural flora prior to European settlement (National Drug Strategy 2001a). The alcohol content of these earlier beverages is, of course, unknown. More recently, discriminatory prohibitions on alcohol have influenced the Indigenous response to political and policy intervention (Brady 2000). But, apart from restrictive initiatives in outback Indigenous communities (d’Abbs 2001; Duncan 2011; Kinnane et al. 2009; Nicholas 2007), Australia has never been subject to strict prohibition (Fitzgerald & Jordon 2009).

Any attempt to greatly reduce availability and access to alcohol is promptly challenged. As history reveals, the Australian ‘Rum Rebellion’ occurred in the early nineteenth century, some decades after European settlement. The community uprising was a challenge to the alcohol monopoly of the New South Wales Corps (Fitzgerald & Jordon 2009). A successful takeover of government alcohol resources was thereby accomplished. Following these occurrences, easy access to alcohol was assured by the actions of successive Governors through the establishment of local alcohol manufacture, albeit tentatively.

Social and other problems from drinking escalated throughout the nineteenth and into twentieth century, with a six o'clock closing time for hotels eventually put in place (Fitzgerald & Jordon 2009). The 'six o'clock swill', as it came to be known, saw drinkers quickly consume as much alcohol as they could before the flow was stopped, with all the obvious consequences of rapid intoxication. As proffered by Fitzgerald and Jordon (2009), the policy was popular with hoteliers; they quickly sold alcohol without the need for extended trading hours and additional labour costs. But this 'policy' approach did little to 'stem the tide' of alcohol or of alcohol related harms. Alcohol fuelled violence, inside and outside the home, was an inevitable consequence of these, supposedly, well intentioned measures. As history would show, it is not easy to get the balance right in public alcohol policy. A reversal of this trend was inevitable.

2.4.2 Country Comparison

While Australia adopted a more liberal approach to alcohol availability and use, other countries embraced different ideals. Strong movements of temperance and prohibition characterised the availability of alcohol in America (Moore & Gerstein 1981). Restrictive alcohol policies applied at political and social levels helped limit availability and reduce the problems of use, often in the context of moral and religious conviction. The Temperance Movement proved popular in America throughout the nineteenth and early twentieth century (Fitzgerald & Jordon 2009). As a consequence, the use of alcohol is still not as prevalent in America as in Australia. Thirty-three percent of Americans remain abstinent (World Health Organization 2004) compared with twelve percent of Australians (Australian Institute of Health and Welfare 2011). As evidence suggests (Australian Institute of Health and Welfare 2008, 2011; Chikritzhs et al. 2003), temperance as a respected virtue has not proven popular in Australia, despite earlier evangelistic efforts by the Temperance Movement to promote a commitment to abstinence.

Even so, many European countries integrate alcohol use within family, social, cultural and religious contexts, and have done so over many centuries (Room & Makela 2000). In some European cultures, recognisable intoxication is viewed as unacceptable (Popova et al. 2007; Room & Makela 2000), especially among older generations practicing the traditional ways of family and community. Evidence shows the integration of alcohol within family settings can provide some protection against harmful drinking and drunkenness (Strunin et al. 2010). Consistent with these findings, Mediterranean countries and culture are usually portrayed as lacking many of the problems of use of other countries. However, this belief is challenged. A high prevalence of alcohol related fetal harms is reported for communities close to Rome, in Italy (May et al. 2011).

In those countries that form modern day Europe, alcohol use and attendant harms are largely westernised (World Health Organization 2005). Countries of Europe that were once part of the Soviet Union have experienced many social and cultural problems associated with alcohol, particularly following the transition from communism to consumerism (Popova et al. 2007). The greatest proportion of morbidity and mortality attributable to alcohol is apparent in the WHO region of 'Europe' (Groves 2010; World Health Organization 2009a). Health and social consequences most likely result from the earlier merging of alcohol into most aspects of daily life in 'older' European societies, together with the direction that alcohol policy has taken in more recent years to consolidate the commercial production of alcohol. Fluctuations in availability and use are consistent with fluctuations in alcohol policy response, with regulatory measures variably applied to populations over time (Babor et al. 2003). All this being so, alcohol has increasingly become a strong symbol of a developed lifestyle in western nations (Sulkunen 2009); consumption levels support this observation.

2.4.3 Australia's Consumption Estimates

The level of alcohol use in Australia is not easy to challenge. The significance of alcohol to the Australian population is reflected in annual consumption data, a cause for public health concern. Australia's alcohol consumption is in the top third of developed countries (Organisation for Economic Co-operation and Development 2010). The annual per capita consumption for persons aged fifteen years and over in Australia is approximately 10.02 litres of pure alcohol (World Health Organization 2011). Local estimates of the Australian Bureau of Statistics (ABS) vary from those of the WHO. Apparent annual per capita consumption in litres of pure alcohol is calculated over time as (Australian Bureau of Statistics 2010-11):

- 2006 - 10.31 litres;
- 2007 - 10.57 litres;
- 2008 - 10.56 litres;
- 2009 - 10.40 litres;
- 2010 - 10.27 litres;
- 2011 - 9.99 litres.

According to ABS data, the expanded market share of 'ready to drink' (RTD) spirits accounted for some fluctuation in product consumption. Following a specific government tax applied in April 2008, sales of RTDs decreased and then rebounded to earlier levels (Greenblat 2009). Other distilled spirits increased in popularity during this period. The apparent quantity of pure alcohol available for consumption for persons aged 15 years and over has continued to decrease since 2007 (Australian Bureau of Statistics 2010-11). This downward trend indicates a reduction in harms could be possible through a reduction in availability and use.

Daily drinking in the over fourteen years age group declined from 8.1% in 2007 to 7.2% in 2010 (Australian Institute of Health and Welfare 2008, 2011). But drinking alcohol daily, weekly or less than weekly continues to be more prevalent than not drinking at all. A greater proportion of males than females drink daily in all age groups, despite the rising popularity of alcohol with young women and the associated harms evident for this gender group (McMahon 2010). The proportion of the population aged 14 years and over that has never had a full serve of alcohol increased after 1998, with a significant escalation between 2004 and 2007 from 9.3% to 10.1% (Australian Institute of Health and Welfare 2008). In 2010, this proportion rose to 12.1% (Australian Institute of Health and Welfare 2011). These data put pressure on governments to continue this trend by delaying alcohol uptake for as long as possible. This evidence also sends a message to the alcohol industry that the popularity of alcohol in Australia may have begun to wane, and greater industry effort may be necessary to encourage higher demand for alcohol. Nevertheless, survey based data is not the most reliable population level estimate; wholesale sales data is the more accurate measure (McCambridge & Kypros 2009).

The suspended collection of wholesale sales data by many states makes it difficult for governments to form an accurate picture of alcohol consumption in Australia. A High Court decision in 1997 altered the taxation advantage for jurisdictions in providing this information to the Commonwealth (Stockwell & Crosbie 2001). Following this ruling, many state governments discontinued the collection of alcohol wholesale sales data. Consequently, methods of estimating alcohol sales and consumption vary between state authorities, as confirmed through the National Alcohol Sales Data Project (Loxley, Chikritzhs & Pascal 2009). In jurisdictions where this data is not systematically collected and analysed, local consumption levels are reasonable estimates only (Chikritzhs et al. 2003).

Other research suggests per capita consumption is underestimated in Australia, due to an increase in the market share of wine and an increase in the overall alcohol content of wine (Chikritzhs, Allsop, et al. 2010). Alcohol related data, described as apparent consumption (Australian Bureau of Statistics 2010-11), does not reflect an upward trend. Unrecorded per capita consumption in Australia is estimated at 0.1 litre of pure alcohol per annum (World Health Organization 2011). Reinstitution of the collection of wholesale sales data across all Australia jurisdictions is pursued as part of the National Alcohol Sales Data Project (Loxley, Chikritzhs & Pascal 2009). The achievement of this aim will provide more reliable population level estimates. In a number of states where wholesale sales data is not systematically collected and analysed, change to legislation will be necessary to legitimise data collection systems and supporting government processes. Such enactment would enable more accurate collation and analysis of consumption data and further inform alcohol's place in Australian society.

2.4.4 The Place of Alcohol in the Australian Context

Alcohol's place in Australian society is crucial to the success or otherwise of national alcohol policy, but will be very difficult to transform within current political and social climates and current levels of consumption. The use of alcohol is embedded in the expectations and social activities of this country. "*I'll get the next round*" is frequently heard in pubs, clubs and restaurants and typifies the significance of alcohol to social functioning and group events. The statement implies that alcohol is a beverage to be heartily enjoyed, a drink not easily refused. Alcohol is revealed as a token of friendship and generosity, imbued with social expectation. But, not all drinkers consume alcohol within 'rounds' of drinking in public places. Some drink with friends and family in private homes (Australian Institute of Health and Welfare 2008, 2011); others prefer to drink alone. Hence, there is no *one* drinking culture that attends the consumption of alcohol in

Australia. Dependent on drinkers' country of origin, social connections and personal values, any number of cultures and practices accompany alcohol use.

The availability and consumption of alcohol now pervades the way of life in Australia.

The ready availability of alcohol continues in cities, rural towns, and Indigenous communities. A vast array of wine, beer and spirit based drinks are available and afforded by most Australians. Approximately ninety percent of Australian adults have tried alcohol (Australian Institute of Health and Welfare 2011); more than eighty percent have consumed an alcoholic drink in the previous twelve months (Australian Institute of Health and Welfare 2008; National Health and Medical Research Council 2009). Violence is a societal problem accompanying the ready availability and excessive consumption of alcohol (Graham & Homel 2008). A large number of licensed venues, outlets and alcohol sponsored events provide unhindered access. Wine clubs and other home delivery programs offer alcohol to the door (Wine Selectors 2012), a convenience that lessens the effort of purchase.

Consumption has, in many social circles, become an important part of what it means to be an 'Aussie' male. In earlier centuries, females were likely to accept the role that alcohol played in the masculinity of their men folk, but were themselves unable to drink legally in hotels until the twentieth century (Fitzgerald & Jordon 2009). Public consumption is, no longer, primarily a male domain. Changes in society in gender roles and workforce expectations have facilitated greater opportunity for women to consume alcohol (Room, Osterberg, et al. 2009). Women drink alongside men in bars, clubs and restaurants, at licensed events like race days, in private homes and family gatherings. Young males continue to consume at reckless levels, often matched by their female companions (McMahon 2010). The use of alcohol is now part of what it means to be a female adult or

teenager. ‘Alco pops’, a spirit based drink especially promoted to younger women, gained prominence in the alcohol market. A decision by the Australian Government to heavily tax this group of beverages resulted in a significant drop in sales in 2008, but towards the end of 2009, sales rose again to double digit growth (Kerr & Franklin 2009). This situation is most likely due to self-correcting market forces and the practice of retailers providing ‘free of charge’ soft drinks with purchased bottles of spirits.

Current levels of access to alcohol are partly due to the introduction of the NCP in Australia in 1995 (National Competition Council 1995). The NCP supports the long term sustainability of industry, but does not take into account the harms associated with alcohol. The aims of the NCP are contrary to a reduction in availability and supply of alcohol that would improve the wellbeing of populations (Bruun et al. 1975; Single 1988; Stockwell & Gruenewald 2001). The NCP supports open competition in business enterprise and makes any challenge to alcohol availability a complex policy agenda. Within this milieu, applications for new or special liquor licenses are not easily refused and evidenced based public policy is difficult to implement.

A review of NCP was conducted by COAG in 2009 (Council of Australian Governments 2009). This assessment did not address the jurisdiction of NCP over alcohol as a harmful product, but focused on the needs of the energy, transport and infrastructure industries. Without political or community challenge to the NCP, alcohol availability will likely prevail at current levels and Australian alcohol policy will continue as a weak and ineffectual response. With no suggestion of change to NCP in relation to alcohol (National Competition Council 1995), licensed outlets across city and suburbs continue to proliferate. These circumstances reflect increased licensing provisions and business practices that overshadow the health and social concerns of alcohol.

Financial benefits to governments and communities drive the national competition agenda. Bottle shops and corner stores with liquor licenses have infiltrated the suburban landscape. It will take sustained effort on the part of governments and communities to resist this trend. An example of a successful challenge to a liquor license application relates to a property previously a petrol outlet in West Hobart, Tasmania (Liquor and Gaming Tasmania 2010). The community had galvanized their views in opposition to the application. According to the licensing decision, the community's position was coherent, and intelligibly expressed. Correspondence from the Director of Public Health opposing the application is an additional reason why the license was refused; close proximity to a primary school is another. Yet, it is interesting to note that the same community often participates in local school functions, like 'quiz' nights, fairs, and 'meet the teacher' events, where liquor licenses are granted and alcohol is readily available.

The power of the alcohol industry as an active political player, and their lobbying strength within government policy processes, strongly contribute to the ready availability of alcohol. The alcohol industry is multinational in structure, finances and political power base, and is a strong influence on policy direction in Australia. The industry has developed its own policy networks through internationally funded organisations like ICAP in America (International Center for Alcohol Policies 2009) and 'DrinkWise' in Australia (DrinkWise 2012). These organisations pose as quasi alcohol policy groups rather than the promotion arm of the alcohol industry they represent, and are skilled in commandeering vulnerable researchers, policy makers and politicians to view alcohol from an industry perspective. In some instances, Australian based alcohol policy makers are drawn into the industry network, align with an industry position, and carry out industry policy work in a number of countries (Bakke & Endal 2010).

The alcohol industry has achieved unprecedented involvement in Australian policy making, as the ‘Alcohol Beverage and Hospitality Advisory Group’ (National Drug Strategy 2006). Industry involvement is likewise evident in IGCD planning for the next National Alcohol Strategy. The inclusion of industry representatives, as equal partners in policy processes, is indicative of an evolving attitude to alcohol in this country. This situation is contrary to an earlier WHO direction on alcohol that entreats the private industry sector not to undertake the public policy work of governments (World Health Organization 2007b). Government processes and industry activity in Australia render any worthwhile advance in national alcohol policy, or, for that matter, alcohol legislation, as an arduous journey indeed.

2.4.5 Alcohol Related Legislative Ruling

The legal framework surrounding alcohol is important to the formulation of public alcohol policy. The High Court of Australia overturned an alcohol related decision by the full bench of the Tasmanian Supreme Court. The ruling concerned the alcohol related death of a motor cyclist following a drinking session at a country hotel. Having handed his keys to the publican for safe keeping, the customer later demanded these be returned. The cyclist then left the hotel on his motorcycle, veered off the road and was killed. A blood alcohol reading of 0.253 was later confirmed. The wife of the dead motor cyclist, together with his insurer, sued the hotel owner and licensee alleging breach of ‘duty of care’. The Tasmanian Supreme Court ruled in favour of the deceased victim, declaring that the publican had a ‘duty of care’ to his patron. The publican then took the matter to the High Court of Australia (High Court of Australia 2009).

The High Court ruled that, except in unusual circumstances “hotel owners and licensees owe no general ‘duty of care’ at common law to customers [requiring] them to monitor and

minimise the service of alcohol, or to protect customers from the consequences of the alcohol they choose to consume” (Denholm & Beerkovic 2009). The judges found the deceased was responsible for his own actions, with the final decision welcomed by local hoteliers and the wider alcohol industry. These findings tip the balance of responsibility from the server to the drinker and certainly provide support to the notion of drinker accountability. Viewing these legal outcomes from a public health perspective, the court decision shows how alcohol availability and drinker control are subject to fluctuation in both public opinion and legal determination. These rulings also reflect the variation in thinking that attends alcohol and the difficulties in confronting harms through legislative and policy means.

2.5 Australia’s National Alcohol Strategy

2.5.1 National Alcohol Strategy Overview

The *National Alcohol Strategy: Towards Safer Drinking Cultures* is Australia’s current national alcohol policy statement (National Drug Strategy 2006). The Strategy represents a considerable challenge to successful policy outcomes in this country. The 2006-09 alcohol policy, extended at government direction to 2012, adopts a sociocultural focus within what is essentially a harm reduction approach. The aim of the Strategy is twofold: ‘to facilitate safer and healthier drinking cultures by developing community understanding about the special properties of alcohol, and through regulation of its availability’. At face value, the aim is laudable. The concept of cultural change is one easily conveyed to the general public and one consistent with the alcohol industry’s position. But viewed from a research perspective, drinking culture is not easily distinguishable from operative social customs or active policy frameworks; the *historical* culture of countries and communities and the prominent *drinking* culture are closely related (Room & Makela 2000). This latter position makes an appeal to drinking culture in the Australian policy context a risky

stance, where the population is representative of many countries and diverse cultures, and drinkers' attitudes and beliefs are also known to vary (National Drug Strategy 2002).

The Strategy's primary goal is 'to prevent and minimise alcohol related harm to individuals, families and communities in the context of developing safer and healthy drinking cultures'. Justification for an overwhelming cultural emphasis in public alcohol policy is lacking. Due to its sociocultural frame, the Strategy focuses primarily on intoxication and the effects of 'binge' drinking (National Drug Strategy 2006). Priority areas are: 'a reduction in the incidence of intoxication among drinkers; enhanced public safety and amenity; improved health outcomes in those affected by alcohol consumption; and the facilitation of safer and healthier drinking cultures'. These are important areas for policy attention through both population and targeted approaches, consistent with an evidence based policy framework. However, these priorities are incomplete in the context of 'harm minimisation' (Lenton & Single 1998).

The Strategy (National Drug Strategy 2006) falls short of the expectations of a national alcohol policy. It fails to address the complexity of issues associated with alcohol consumption and does little to prevent the prevalence of risk and harms. This omission is manifest in the lack of scope of a number of priorities. Evidenced approaches to reduce demand, consumption and harms - such as availability, legislation and taxation (Babor et al. 2003; Babor et al. 2010; Loxley et al. 2004) - are not afforded the full attention they deserve. Gaps are apparent in the breadth of interventions, as well as the evidence to justify strategic focus. The Strategy does not aim for a reduction in alcohol supply or, for that matter, population consumption. Availability is conceptualised within cultural place, and strategies to control availability are insufficient to bring about worthwhile population level change. There is scant acknowledgement of the wide range of behaviours

contributing to alcohol risk and harms. There is certainly no reference to population theory or behavioural theory as important knowledge for public alcohol policy.

A focus is missing on the prevalent patterns of consumption, apart from those related to intoxication (National Drug Strategy 2006). Despite some acknowledgement of perceptions in the introductory discourse, the various motivations, expectancies, and perceptions associated with drinking are not afforded attention. Interventions to change drinkers' perceptions of alcohol availability and behavioural control are lacking. There is no evidence of targeting the full range of at risk drinkers, as vulnerable population groups. Loss of control, a behavioural characteristic associated with alcohol problems (American Psychiatric Association 2000; Heather 1995), is not addressed. In these ways the Strategy overlooks the rich evidence base that demands a policy response (Babor et al. 2003; Babor et al. 2010; Loxley et al. 2004). So many urgent needs remain unvisited.

The Strategy aims to ensure inclusive responses for Aboriginal and Torres Strait Islander peoples and to identify interventions for their communities (National Drug Strategy 2006). But the Strategy does little to acknowledge the links between Indigenous history and culture and the consumption of alcoholic beverages (Brady 2000). The Strategy fails to address the impact of Australia's NCP, providing an open and competitive market and perpetuating alcohol risk and harms (National Competition Council 1995). There is no documented intent to increase the legal drinking age, an effective means of reducing traffic accidents for young people (National Preventative Health Taskforce 2008; Stockwell & Gruenewald 2001). Nor are situational influences such as density of alcohol outlets and hours and days of sale given priority attention. A concentration of effort on reducing intoxication, addressing the public and personal consequences of intoxication, and ameliorating the effects of intoxication is apparent, with a distinction drawn between

‘drunken’ cultures and ‘drinking’ cultures (National Drug Strategy 2006). Yet, what constitutes a healthy drinking culture is not clearly defined.

There is little focus on reduced alcohol supply. With a primary focus on the sociocultural influences on intoxication, and strategies that are predominantly directed towards harm reduction, the current Strategy is unlikely to achieve its primary policy aims (National Drug Strategy 2006). Both schemas are too narrow to justify such prominence in public alcohol policy; supply reduction and demand reduction are excluded as policy aims. In addition, collaboration with the industry contributed to this weakened policy framework; concession by alcohol policy makers to the industry position is of related strategic concern. National policy in Australia goes a long way to support the industry’s position that alcohol is not the cause of alcohol harms; misuse by drinkers is proffered as the prevailing political and policy consideration. The population as a whole, and those most vulnerable to alcohol, will continue to pay the price of deficient public alcohol policy. This situation will likely persist as long as the NCP continues to promote increased productivity related to alcohol, and COAG continues to endorse alcohol associated business competition.

As an alternative focus, a strong public health framework would challenge the level of availability and consumption (World Health Organization 2009b), not merely aim to progress ‘towards safer drinking cultures’ (National Drug Strategy 2006). In support of a different national policy focus from that of the cultural aspects of drinking, reliable and systematic evidence of variation between drinking cultures, at least in Europe, is yet to be established (Skog 2001a). Sociocultural factors are not generally the predominant influence on drinking behaviours or associated risk (American Psychiatric Association 2000; Goodwin 1985). A reduction in alcohol availability and stronger behavioural control are aims that would improve the health of the population, and are more consistent

with the desires of the community at the time of consultation for the Strategy (National Drug Strategy 2006). While cultural influences on consumption are best not ignored in alcohol policy (Peel 1997), the public health issues of alcohol availability and drinkers' behavioural response should be the primary focus. This position represents a challenge to current policy thinking and current public alcohol policy direction for Australia.

2.5.2 Alcohol Strategy Comparison

The primary focus of national alcohol policy shifts with successive iterations, not unusual with public policy development. Policy variation adds to the complexity of achieving lasting environmental change. The National Campaign Against Drug Abuse (NCADA), established in 1985, was the first formal recognition by an Australian Government that the use of alcohol and other drugs required political attention (Commonwealth of Australia 1985). Strategic funding and resourcing were integral to the approach. The policy position was achieved due to the commitment of the then Prime Minister (PM), Robert (Bob) Hawke. Policy advancement was influenced by the illicit drug use of a member of the PM's family and the government's commitment to change following these circumstances (Pennington 1999). To date, there have been no similar extraordinary events to further advance alcohol and drug policy in Australia.

Since that time, successive alcohol policies have been developed. The global burden of disease formed the dominant paradigm of the National Alcohol Strategy 2001-04; alcohol is acknowledged as an important public health concern (National Drug Strategy 2001b). The goal of this former Strategy is documented: 'to build a healthier and safer community by minimising alcohol related harm to the individual, family and society, while recognising the potential social and health benefits from alcohol'. Consistent with research findings at the time, the balance between the burden of disease and potential

benefits of use are reported as negative for men and almost equal for women (National Drug Strategy 2001b). The aims of this Strategy are stated as: ‘a reduction in the incidence of premature alcohol related mortality, acute and chronic alcohol related morbidity, alcohol related social disorder, violence and crime, and related economic loss in Australia’. These aims are realistic; they acknowledge the risks associated with consumption and the likely consequences of use.

The effects of long term excessive alcohol consumption are clearly identified in the former Strategy (National Drug Strategy 2001b). Potential health benefits of defined ‘low risk’ consumption are outlined, supported by evidence current at the time. This Strategy emphasises both risky levels of consumption and risky patterns of use as worthy of policy attention. Susceptibility to alcohol misuse is acknowledged. Interventions are aligned with the intrinsic properties of alcohol and the escalation of harms from increasing use. Contrary to current national alcohol policy (National Drug Strategy 2006), consideration is given to the level of community consumption as a strong contributor to the overall experience of alcohol harms (National Drug Strategy 2001b).

In so many ways, the current National Alcohol Strategy (National Drug Strategy 2006) diverges from the strengths and achievements of the previous alcohol strategy, despite the claim of a good evidence base and a stated intention to build on past strategic efforts. The special properties of alcohol are inadequately described and poorly addressed; a sociocultural focus rules out evidenced policy levers, such as reducing overall availability and decreasing population consumption (Babor et al. 2003; Babor et al. 2010; Loxley et al. 2004). In so doing, a range of alcohol control measures are excluded. The lack of emphasis on control of availability and control of behaviour contributes to a loss of potential alcohol policy effectiveness.

2.5.3 Supporting Consultation Processes

Despite these limitations, public consultation occurred in the lead up to the current National Alcohol Strategy (National Drug Strategy 2006). With invited jurisdictional input, improved policy outcomes could have resulted. The opinions and preferences of jurisdictional governments, academics, clinicians, policy makers and a range of community organisations and individuals were sought through collaborative practice. Consultation revealed a public belief that the availability of alcohol has proliferated due to the normalisation of alcohol use within Australian society. The increase in alcohol availability, especially through licensed outlets, is seen as significant and mostly driven by NCP. Also prevalent is the belief that availability is more effectively regulated by better enforcement of existing licensing laws. Public opinion afforded support for price related levers, such as taxation, and tighter alcohol regulation for high risk drinkers and vulnerable population groups (Australian Institute of Health and Welfare 2005a). These views did not prevent the flawed nature of current alcohol policy.

With the current National Alcohol Strategy, the Australian Government has given reign to popular policy approaches that continue easy access to alcohol, yet has avoided the important strategic work of reducing availability and consumption. Within this milieu, attention is drawn to policy decisions influenced by predominant social values and fear of voter backlash (Wellbourne-Wood 1999), rather than the complex policy challenges that attend alcohol in the public domain. Irrespective of these pressing concerns, a goal of safer drinking culture now dominates much national thought regarding alcohol policy. Such appears to be the way of policy development.

Real progress has not yet been made in preventing risk and harms from alcohol. The political will on the part of many politicians to attend to alcohol in meaningful ways is

lacking. The jurisdiction of NCP regarding alcohol is yet to be seriously challenged (National Competition Council 1995). Political abrogation is apparent, despite the public health problems associated with alcohol (Room, Babor & Rehm 2005). Licensing processes continue to add to the number of liquor outlets. This situation is evident throughout Australia and in the state of Tasmania, where the number of liquor licenses has risen by approximately thirty percent since 2002 (Department of Treasury and Finance 2010). Abundant availability of alcohol through commercial and social means (Bruun et al. 1975; Single 1988; Stockwell & Gruenewald 2001), together with diminished personal control on the part of drinkers in general (Heather 1995), compound the problems associated with alcohol and lessen the likelihood of a strong public policy response. The popularity of alcohol adds to the difficulties of reducing supply and reducing demand. Lasting solutions to pressing alcohol concerns are yet to be introduced.

2.6 The Case for Improved Public Alcohol Policy

There is an urgent need for the Australian Government to deliver effective public alcohol policy, given the health and social harms that attend alcohol in the public domain.

Alcohol, as a legal substance, is consumed at risky levels (Australian Institute of Health and Welfare 2011; National Health and Medical Research Council 2009), requiring a stronger policy response than has occurred to date. Adding to this urgency, alcohol is a contributing factor in many preventable conditions; some are chronic in nature (Chikritzhs et al. 2003; National Health and Medical Research Council 2009; National Preventative Health Taskforce 2008). Alcohol associated diseases, accidents and other events negatively affect individuals, communities and society. The harms and costs attributable to alcohol place a burden on the public and private health systems of this country (Collins & Lapsley 2008; National Preventative Health Taskforce 2008, 2009).

Harms from alcohol are currently addressed in Australia through different national policies and strategies and various expert committees, as previously discussed. This division of governance and governance related practice makes the achievement of real policy change a complicated task. Governments, in the main, lack the political will to persevere with broad sweeping policy reform. They strive to reduce alcohol related harms by endorsing strategies and actions for alcohol (National Drug Strategy 2006; National Preventative Health Taskforce 2008, 2009). Yet, they appear unwilling or unable to address the real issue of rampant availability; increased licensing provisions prevail (Department of Treasury and Finance 2010). Putting the alcohol industry 'off side' is not seen as a political option, due to the fiscal and other benefits that alcohol provides.

Despite some national effort to confront intoxication (National Drug Strategy 2006), the failure of successive Australian Governments to reduce the harms from alcohol is cause for ongoing concern. In this policy milieu, a way of specifying universal and personal risk is urgently required; the need to reduce risk is also pressing. The extent of harms for drinkers and for those not directly involved in consumption (Alcohol Education Research Foundation & Turning Point 2010; Casswell, You & Huckle 2011) highlights the gaps in current policy approaches. The National Preventative Health Taskforce (NPHT) goal of a 30% drop in risky and high risk drinkers by 2020 is a step in the right direction and would, ipso facto, increase the proportion of low risk drinkers in the population (Chikritzhs, Whetton, et al. 2010). If these aims are able to be achieved, some health and social gain would eventuate for the community. Notwithstanding, the challenge of alcohol continues because individual approaches have been put forward at the expense of population based public health strategies (Room, Babor & Rehm 2005).

A strong alcohol policy framework, that limits population availability and consumption and modifies situational and behavioural factors, could deliver health and social gains. With this in mind, the development of comprehensive and complementary strategies to reduce total consumption and associated risk are warranted (Osterberg 2006). An indicative example is the European Alcohol Action Plan proposing two main policy levers: “a population based approach to reduce overall alcohol consumption by the targeted amount of 25%; and a harm reduction approach aimed at high risk groups and behaviours” (Babor et al. 2003, p. 242). But, according to Room and colleagues (2005), those policy levers that are most effective, like reducing availability, are not so popular with governments [or the alcohol industry], making robust policy development a complex undertaking.

2.7 Creating Strong Public Alcohol Policy

Policy advancement is not beyond the realms of possibility. However, large gains are not generally made in public alcohol policy; the NCP and the alcohol industry continue to impact on policy direction. An account of evidence based policy measures are outlined in *Australia: the Healthiest Country by 2020* (National Preventative Health Taskforce 2009). The focus is on primary prevention initiatives, with a range of policy issues addressed concurrently. The National Preventative Health Taskforce (NPHT) has sought to achieve the status of Australia as the healthiest country by 2020. This objective is laudable, considering the harms that attend the availability and use of alcohol in this country. Associations between alcohol use and other risk factors, like smoking and obesity, are highlighted as areas for policy attention.

Improving health is complex, in need of evidenced and clearly structured reform. The recommendations of the NPHT require formal endorsement by national and state

governments in order to be effectively progressed. Allocation of particular parts of the alcohol prevention agenda to specific national committees is warranted. It remains to be seen if the political will to resource a health strategy of this magnitude can be found. The phased in nature of the National Preventative Health Strategy (National Preventative Health Taskforce 2009) is to be applauded. Nonetheless, in the absence of a strong policy focus on limiting alcohol availability, the aim of the preventive strategy - to reshape attitudes to promote a safer drinking culture - will face similar difficulties to the current National Alcohol Strategy (National Drug Strategy 2006).

Achieving a better policy mix between the legal status of alcohol and a reduction in associated harms is a demanding policy exercise. This is necessary if the potential for greater health and social gains is to be realised. In the current political and social environments in Australia, the role of policy communities - such as the Alcohol and Drug Council of Australia, the Alcohol and Drug Foundation, the National Alliance for Action on Alcohol, the Foundation for Alcohol Research and Education, and the Australian National Council on Drugs – is vital to reducing harms from the legal availability of alcohol. Policy communities are active in lobbying governments and discussing alcohol policy agendas in the public arena (Alcohol and Other Drugs Council of Australia 2011; Foundation for Alcohol Research & Education 2012b). The strength of policy communities lies in their relative independence from government and industry sway. This position draws support, with emphasis on the importance of networks of influence on policy processes and outcomes (Lewis 2009). If governments continue to defer to the preferred policy direction of the alcohol industry, the work of these policy communities and networks of action will be even more crucial to a sound national policy position on alcohol.

A discourse is urgently needed to address the ineffectiveness of current national alcohol policy in Australia. Health and social harms from alcohol continue and many Australians drink above safe drinking levels (Australian Institute of Health and Welfare 2011; National Health and Medical Research Council 2009). Alcohol policy communities are strategically placed to participate in this debate. The dimensions of policy discussion can be further influenced by policy entrepreneurs (Oliver 2006); new leaders can enliven policy discourse and help provide a momentum for change. Real opportunity for policy transformation occurs when new voices are heard (Lewis 2009). The emergence of entrepreneurs, relatively new to the alcohol policy arena and unsullied by previous exposure to political influence or industry sway could refresh the alcohol policy debate.

The success of the LWAP of the Northern Territory of Australia is testament to what can be achieved with ‘grit’ and determination, including a willingness to embrace political risk within the alcohol policy environment (d’Abbs 2004). The strong evidence base of the LWAP gives hope to the achievement of a future policy ‘nirvana’, where political decisions are based on good evidence and made in the best interest of the community. According to d’Abbs (2004) “governments can take bold initiatives in alcohol policy and survive – notwithstanding the powerful vested interests they might ruffle” (p. 64). But, achieving good balance in public alcohol policy can be as much about the informal connections underpinning policy, as it is about the more formal relationships of power and politics.

National alcohol policy cannot continue to depend on harm reduction principles without the adoption of more rigorous frames of reference. A number of options are evident. As one developmental measure, agreement on a set of ethical principles for the alcohol and other drug sector is crucial to improved alcohol policy outcomes (Miller 2005). As

another, investigating and systematising the evidence for limiting availability and reducing consumption levels is warranted. In accord with these sentiments, the inadequacy of current interventions to reduce availability and strengthen behavioural control is again emphasised. These pressing issues remain, yet require immediate attention in the alcohol policy arena. But, as is evident in many policy environments, health and social problems do not always translate into a strong policy frame or successful policy practice.

Nonetheless, a window of opportunity presents. The Australian Government has renewed attention on the problems related to alcohol and possible policy solutions. The media reflects this focus. Alcohol products, such as ‘alcopops’ (Kerr 2009a), and the role played in youth ‘binge’ drinking problems are subject to media scrutiny (Greenblat 2009). Further stimulating the debate, alcohol related violence and injury is also afforded media coverage (Perpitch 2009). Public discussion and media attention surrounds the issue of ‘binge’ drinking, a largely ‘out of control’ response to alcohol. As well, newspaper, television and other media cover issues related to alcohol, like availability in remote Indigenous communities (Murdoch & Skelton 2011) and alcohol taxation and the need for pricing reform (Metherell 2011). In view of these concerns, it can be said that a dialogue has commenced, albeit tentatively. A way to extend the public debate and further progress the alcohol policy agenda needs to be identified.

2.8 The Role of Public Health in Alcohol Policy

Addressing alcohol within a public health, rather than a sociocultural framework, will expand the policy approaches able to be applied at the population level. A population focus in a public health context is endorsed by the National Public Health Partnership (NPHP) Agreement (Reynolds 2009). The NPHP definition of public health is: ‘the organised response by society to protect and promote health and to prevent illness, injury

and disability'. Whole populations, as well as those most at risk, receive attention. The terms used in Australia to define the levels of prevention in a public health context are: primary prevention - total populations and selected groups; secondary prevention - at risk individuals; and tertiary prevention – clients and patients of health services (National Public Health Partnership 2006).

The main benefit of a public health approach is the alleviation of harms through addressing the cause at the population level. If the health of the community depended on the capacity of individuals, large scale failure of public health policy would occur (Magnusson 2009). A public health perspective on the risks, harms and consequences of alcohol use relies on a strong evidence base (Jernigan et al. 2000; Room, Babor & Rehm 2005) and represents a credible policy option at national and state levels. Even so, “no single policy formula or panacea” is presently available to address the range of alcohol related problems (Jernigan et al. 2000, p. 494). Yet, adoption of a public health approach to alcohol policy would do much to reduce the population burden of alcohol and reduce the harms at community and individual levels (Room, Babor & Rehm 2005).

A credible evidence base is essential to good public health, and is paramount to the successful framing of public alcohol policy (Holder 2005; Loxley et al. 2005; Marmot 2004a; Room, Babor & Rehm 2005; Sengupta & Hoyle 2005). Evidence is also an essential component of policy documentation (World Health Organization 2007a). But, according to some, reference to evidence is ‘perhaps the most important but least influential route’ to policy success (Babor 2000). This sentiment is crucial in complex environments where availability, consumption and harms are interconnected (Bruun et al. 1975). There are limits to the extent to which evidence can improve policy, with politicians and practitioners using ‘policy based evidence’ to further political ends

(Freiberg & Carson 2009). Votes do trump facts in political and policy decisions (Harris 2008); evidence is less influential than electoral voter popularity. However, other factors come into play, such as policy funding and resourcing, workforce development, and the machinations of government as earlier discussed.

Population risk management is a goal of a public health approach to alcohol. This means addressing the availability of alcohol as the source of alcohol problems. A reduction in availability can be achieved through legislation, regulation and the enforcement of public health guidelines, in association with taxation and pricing levers (Babor et al. 2003; Babor et al. 2010; Loxley et al. 2004). But the success of regulatory approaches to public health problems can, at times, be subject to compromise. Within a public health enforcement model, close relationships between the regulator and industry entities can lead to ‘regulatory capture’, where the regulator is unwilling to jeopardise relationships with industry and, instead, jeopardises the effectiveness of the regulatory process itself (Hobby 2009). Regulatory compromise is an inevitable outcome when the regulators of alcohol work in close contact with the alcohol industry (Casswell 2009). These circumstances are a potential risk for public health legislative and policy frameworks for alcohol.

Social control forms part of the overall public health agenda to achieve safer alcohol environments and improve societies in general. Social control is emphasised in efforts to reduce Indigenous drinking and associated harms (d'Abbs 2001), an area of specialisation in national alcohol policy. The targeting of specific populations in need, such as Indigenous Australians, is consistent with a public health policy position. Population level interventions are categorised by d'Abbs (2001) within a number of control constructs: deployment of formal social control mechanisms - law enforcement; attempts to influence informal control mechanisms - media campaigns; and manipulation of formal control

mechanisms in order to influence informal controls - random breath testing. Within an Indigenous context, d'Abbs (2001) strongly argues for social control to be added to the public health model of managing alcohol.

Social control is acknowledged in public health practice as worthy of detailed attention. According to d'Abbs (2001), a detailed analysis of alcohol and social control would explore: the universal qualities of alcohol; the values and costs of use; the distribution of power in social structures; the available means of control; the probability of resistance; and the patterns of values in cultures and for individuals. An investigation of this magnitude certainly has merit, as it would further inform the evidence base of social control mechanisms for public health policy. Social control means reducing supply, access and availability; lowering demand and consumption; and increasing regulatory control; consistent with a harm minimisation framework (Lenton & Single 1998). Social control is relevant to legislation that regulates access and reduces the volume of alcohol available for use. As it stands, social control is an important part of a population health approach to alcohol policy in Australia.

As a counter argument, *The Australian* newspaper declares that “health is a new word for total control” (Kerr 2009b). This view is consistent with the ‘nanny state’ debate that argues against the loss of personal freedoms in the wake of government control (Callman 2009). Kerr (2009b) claims the Australian Government has a massive social engineering agenda that will necessarily affect matters of governance, economic priorities, trade arrangements, market deregulation, foreign investments, fiscal policy and the extent to which policy systems and processes are inclusive. The concerns raised by Kerr relate to alcohol, tobacco, and obesity and the strategies of the NPHT for these particular health and social problems (National Preventative Health Taskforce 2009). The extent of social

engineering and social control is put forward by Kerr as a basis for public unease and electorate action. However, “the state has a duty to look after the health of everyone and sometimes that means restricting people’s choices” (Callman 2009, p. 6). Even so, the approach proposed by the NPHT could bring about an improved national alcohol policy and, ultimately, freedom from the tyranny of alcohol in the public domain.

Notwithstanding, the primary goal of public alcohol policy is to promote the health and social wellbeing of the general public (World Health Organization 2007b). Within a public health perspective, people’s choices are actively guided to make decisions in their best interest (Marteau et al. 2011). In this context, health and safety are human rights that coexist with the right to drink alcohol (Vandenberg, Livingston & Hamilton 2008). Social control is reasoned to take place through both informal interactions of policy players and formal agency involvement, with virtually the entire public health repertoire of alcohol policy measures viewed as social control (d’Abbs 2001). Social control can be valuable as it improves health and social outcomes not only for populations, but communities and individuals as well. Social control can take the form of government monopolies on alcohol, or regulation of the private alcohol market (World Health Organization 2007b).

A public health approach to alcohol policy would strongly rely on population evidence, could limit industry influence, and may help reverse the risk and harms that prevail. If a public health framework is adopted for alcohol, the community might have greater confidence in a health and social agenda supported by sound principles, not one subject to industry manipulation or government abrogation. Future alcohol policy would, ideally, be created through improved policy making processes, where notions of policy competition are diminished, the health and wellbeing of the population are paramount and political power and industry profits are seen as secondary concerns. It is acknowledged that the

achievement of these laudable goals is still a long way off. The research of this thesis can advance these claims.

Before the implementation of the next National Alcohol Strategy, a robust alcohol policy framework needs to be identified and marketed to governments, the community, and to individuals at risk. As an ideal, Australian governments could adopt an alcohol policy position that concedes society has gone too far in tolerating the environmental risks associated with availability, the range of consumption behaviours compounding risk, and the fiscal, health and social costs accompanying risk. As an alternate policy agenda, greater control of alcohol availability and drinker behaviour could be possible. There is, therefore, a strategic imperative for the following objectives to be advanced:

- a reduction in the population level of availability of alcohol;
- a reduction in the situational availability of alcohol;
- a reduction in the population level consumption of alcohol;
- a reduction in alcohol consumption for those most at risk;
- a reduction in risky behaviours associated with alcohol use; and
- an increase in drinkers' behavioural control.

These aims highlight the need for greater sophistication in framing alcohol policy and greater resolution in policy implementation. Embracing these aims as important policy levers could deliver improved health outcomes for the next generation of drinkers. But, changing the environmental context of alcohol use and the behavioural attributes of consumption is a complex policy task. Political and social origins of alcohol problems, as well as international and national circumstances, contribute to the challenge. Finding a way to balance these agendas represents an important step forward.

It is timely that new ways of developing alcohol policy are investigated. Present policy processes do not support cohesive policy framing or the conduct of specific alcohol research for public policy consideration. Much policy is made ‘on the run’, with a ‘scattergun’ approach to strategies and actions. These circumstances make it easier for business and industry to inveigle themselves into public policy making and influence policy direction. In such an environment, it is easier for policy makers to introduce a focus that supports their policy preferences, without reference to the wider body of available literature. Such an approach precludes exploring theory for policy. To build a strong public alcohol policy for Australia, better use can be made of existing evidence (Redman, Stickney & Mitchell 2011) and better ways developed for systematising the evidence.

2.9 Exploring Theory for Public Alcohol Policy

In an ideal environment, establishing the parameters of alcohol policy requires reference to all reliable evidence, including theory, in support of effective practice. In addition, policy knowledge needs to be useable for governments and policymakers, as well as credible to the community (Adams 2004). In Australia, the connections between alcohol policy, research and theory are acknowledged, primarily, by theorising the policy making process (Lenton 2008). Through reference to theory, achieving a balance between alcohol availability and drinkers’ behaviour is a laudable policy aim. Without reference to relevant evidence, such as theory, opinion can be treated as confirmation, and inadvertently be included in policy. As an example, the current National Alcohol Strategy is not underpinned by a strong evidence base; rather a sociocultural focus predominates (National Drug Strategy 2006). In this political and policy context, a range of reliable measures are urgently needed to reverse the availability of alcohol in all its forms (Huckle, Pledger & Casswell 2006; Marmot 2004b). A way of more accurately defining strategies

for those most at risk also needs to be identified. A clearer distinction between policy expectations and personal responsibility is needed.

An analysis of theory for alcohol policy is proposed as a valid and optimistic process. Learnings from theory have not been previously sought for national alcohol policy in Australia. This omission is not easy to explain; although a full range of evidence is not usually discussed as a basis for alcohol policy. The influence of industry limits an evidence based alcohol policy approach. While these circumstances are documented to some extent, use of a theoretical perspective to inform alcohol policy is less so. Relevant theory could help organise available evidence and improve the structure and cohesiveness of public alcohol policy. Visiting theory could enlighten the issues surrounding the availability and consumption of alcohol, and add to future alcohol policy success. This is proffered as a more reliable process than the path usually taken. In accord, the level of perceived risk and the extent of control over that risk are paramount in setting the public health policy agenda (Oliver 2006).

The next chapter examines the literature relevant to the problems associated with alcohol and investigates potential policy solutions. The review of the literature determines how alcohol policy can be strengthened and the influence of theory on current public alcohol policy. A comprehensive review of the literature will help clarify the direction of future alcohol policy and provide a fresh approach to strategic intervention. Reference to the evidence, including theory based research, could reveal how a reduction in alcohol availability and stronger behavioural control can be achieved. Reference to research findings may challenge the alcohol industry argument that the primary problem associated with alcohol is how it used, and not the intrinsic properties of the beverage itself. In

keeping with the notion of public availability and personal behaviour, this thesis explores the relevant literature with a view to developing a public alcohol policy model.

Chapter 3: Literature Review

3.1 Literature Search

Chapter Three examines the literature associated with the thesis inquiry - “*how does relevant theory inform a public alcohol policy model?*” Key issues for policy attention are established; gaps in current research are identified. Evidence is primarily drawn from academic literature and government documentation. International and national medical, health science and addiction literature, as well as national policy documents and survey findings support the inquiry. Peer reviewed journal articles are critiqued. Published alcohol and drug strategy documents and publications produced by the World Health Organization (WHO), the Australian Government National Drug Strategy, the National Health and Medical Research Council, and the Australian Institute of Health and Welfare are searched. Also examined is the evidence base for alcohol policy and population level intervention. Documentation from industry funded policy groups, such as the International Center for Alcohol Policies in America and ‘DrinkWise’ in Australia, is accessed.

The literature is investigated to determine the relevance of theory to public alcohol policy and a public alcohol policy model. Examination occurs in two main sections: *The Problems Associated with Alcohol*; and *Potential Policy Solutions*. Evidence regarding the intrinsic properties of alcohol, levels and patterns of consumption, risks, harms, costs and benefits is investigated. Global and local estimates of harm are established. Challenge to the benefits reported from alcohol use is explored, not only for drinkers, but for populations as well. Research is analysed to determine if a harm reduction emphasis for national alcohol policy is supported by a reliable evidence base.

Alcohol policy solutions are sought. Investigations exploring the environmental context of alcohol use and the attributes of personal drinking behaviours are analysed. Population

and economic availability are examined, together with the links between situational availability and consumption associated risk. Subjective awareness of both alcohol availability and behavioural control forms additional parameters for the way the literature is approached. Gaps in research are identified; these guide the direction of the investigation to follow. The review of the literature indicates the difficulties in combining coherent evidence for policy as well as the substantial challenge in directing findings for a public alcohol policy model. The potential to inform alcohol policy through a confluence of population and behavioural solutions is emphasised.

3.2 The Problems Related to Alcohol: Risk and Harm Associations

3.2.1 Overview

The problems related to alcohol are investigated in two main sections: *Risk and Harm Associations*; and *Framing Policy for Alcohol*. The risk, harms and costs from alcohol are linked with the intrinsic properties of the beverage, the level of consumption and the ways alcohol is used. Also significant to the development of risk and harms are environmental factors such as drinking location, the social milieu, and other situational variables that impact on consumption. Some population groups are particularly vulnerable to risk and harms from alcohol. While some benefits are reported from low levels of use, these claims are now effectively challenged. Current public alcohol policy framing has added to the problems associated with alcohol use.

3.2.2 Intrinsic Properties of Alcohol

Alcohol persists as a public health problem (Rehm, Room, Monteiro, et al. 2003; Room, Babor & Rehm 2005). This is due to two primary reasons: the risk and harms associated with the beverage, and the challenge in achieving effective policy solutions. The intrinsic

properties of alcohol are fundamental to the health and policy challenges associated with alcohol. Alcohol consumption causes a number of harmful effects in drinkers. The primary attributes of alcohol are neurotoxic, carcinogenic and addictive in nature (Julien 1995; World Health Organization 2007b). As a drug (Julien 1995), but also a legal product in the majority of countries, alcohol is deemed ‘no ordinary commodity’ (Babor et al. 2003; Babor et al. 2010). Alcohol is capable of creating damage to nearly every tissue and system in the human body, and contributes to physical, psychological and social harms for drinkers (Jernigan et al. 2000; World Health Organization Secretariat 2004). In recent decades, international research and data analysis has contributed to a greater understanding of alcohol, its intrinsic properties and specific problems of use; these relationships are complex and multidimensional (Room, Babor & Rehm 2005). Due to the specific effects of alcohol on drinkers, harms can impact on nondrinkers as well (Room, Laslett, et al. 2009).

Alcohol presents a significant challenge for whole populations and those most vulnerable to risk. Consumption of alcohol causes immediate and, at times, long term physiological and psychological changes for the drinker; ingestion of alcohol results in a number of neurological effects on the central nervous system, including the brain (Julien 1995; World Health Organization 2007b). Relatively small quantities of alcohol can cause these alterations. Longer term effects such as neuroadaptation, a molecular change in the brain, also occur. Tolerance and dependence result from longer term use (American Psychiatric Association 2000).

The properties of alcohol are responsible for a large proportion of the physiological (American Psychiatric Association 2000; Babor et al. 2003; Babor et al. 2010; English et al. 1995; Jernigan et al. 2000; Marlatt et al. 1988; Rehm, Gmel, et al. 2003; Ridolfo &

Stevenson 2001; Room, Babor & Rehm 2005; Sengupta & Hoyle 2005; Tiihonen et al. 1997) and psychological consequences of consumption (American Psychiatric Association 2000; Tiihonen et al. 1997). As a teratogen, or cancer forming agent, alcohol causes fetal harm (World Health Organization 2007b). Of note, the International Agency for Research on Cancer determines that alcoholic beverages are carcinogenic to humans at the highest classification of Group One (Room & Rehm 2010; World Health Organization 2007b). The Cancer Council of Australia supports this position through a policy statement on the associations between alcohol use and cancer (Winstanley et al. 2011).

Nonetheless, alcohol consumption confers enjoyment to drinkers; for many, alcohol use is a highly pleasurable activity. Alcohol is able to bring about rewarding changes in the brains of drinkers (World Health Organization 2007b), accounting for much of its popularity. According to the WHO, pleasant feelings are generated from the endogenous opioid system, particularly with lower levels of consumption. But, ingestion at higher levels can result in intoxication, sedation, coma, respiratory failure and death. Harms are due to alcohol's poisonous, intoxicating and depressant properties (Julien 1995). Given the enjoyment most drinkers experience from consumption, it is a challenge to convince the population that all alcohol use has some associated risk (National Health and Medical Research Council 2009). This task is fundamental to strong public alcohol policy and strategic intervention for Australia.

3.2.3 Level of Use and Risk of Harm

There is evidence of a dose response between alcohol intake and risk of harm.

Associations are such that the higher the level of consumption, the greater the likelihood that harms will occur. These relationships are apparent with the development of cancers, blood pressure, stroke, cardiac conditions, liver cirrhosis, delirium tremens, alcohol

dependence, impaired brain function, and congenital defects of the foetus (Edwards et al. 1995; Single 1988). A dose response is also evident with alcohol poisoning (Pequignot 1986). Increased relative risk occurs with even modest levels of consumption (Duffy 1986; National Health and Medical Research Council 2009). These findings are backed by evidence to confirm, beyond a low intake, higher levels of consumption result in heightened mortality risk (Edwards et al. 1995).

Negative effects result from the level of consumption of populations, as well as individual use (World Health Organization 2011). Absolute lifetime risk of injury increases in accord with the number of drinks per occasion and the number of drinking occasions; for both men and women, a sizeable increase in risk occurs at three drinking occasions per week (Rehm, Room & Taylor 2008). In analysis of population survey data, moderate and heavy drinkers are at higher overall risk than light drinkers; rates of drinking 43 or more drinks per month, more than three drinks per occasion, and more than 21 times a month are each associated with increased mortality risk for male youth (Leino et al. 1998). With similar levels of intake, women are at higher risk than men of a number of conditions including cancer and liver disease, due to differences in metabolic processing of ethanol between the genders (Di Castelnuovo et al. 2006).

The relationship between consumption and risk is complex. Aetiological fractions for the Australian population confirm positive correlations between the consumption of alcohol and a range of alcohol associated harms (Ridolfo & Stevenson 2001). With some diseases, like liver cirrhosis and cancers, there is a considerable time lapse in the development of harms; the older age group (40-74 years) is more likely to die from the chronic effects of consumption (National Drug Research Institute 1999). A number of other alcohol associated conditions do not display the dose response of diseases like cirrhosis of the liver

(Skog 1986). In this regard, younger people (aged 15-29 years) are more likely to die from acute harms, such as alcohol related injury (National Drug Research Institute 1999), especially young males (Begg et al. 2003).

Many of the harmful effects of consumption are apparent at the population level. Total population consumption is correlated with the rate of aggregate mortality, particularly for middle aged men; a one litre increase in annual per capita consumption of pure alcohol for males results in a one percent increase in alcohol related deaths (Edwards et al. 1995).

When the population mean of consumption increases, this can signify most drinkers in the population are consuming more (Skog 1985), not just drinkers at the heavy end of the drinking scale. Changes in consumption levels inevitably impact on mortality rates from diseases like liver cirrhosis (Skog 1986), cardiovascular disease (Rehm, Gmel, et al. 2003), and cancers (Ridolfo & Stevenson 2001); a position borne out by long term trend analysis of population level data.

The relationship between consumption and harms is not linear. Risk increases at a faster rate than consumption, and sometimes an increase in population harms is due to increased consumption by light as well as moderate drinkers (Krietman 1986; Makela 2002).

Lighter drinkers are more susceptible to variations in cultural norms than heavy drinkers, a situation explained as the ceiling effect (Skog 1985). Lower intake groups, as light and medium drinkers, can show an increase in consumption as the population mean increases, and at a greater rate than the higher consumption group. The observations of Skog (1985) show “the population tends to move in concert up and down the scale of consumption” (p. 83). Boundaries between drinking categories are therefore fluid, rendering a focus on groups most at risk as a difficult policy agenda. Yet, the links between the consumption of alcohol and the harms that result are crucial for some categories of drinkers in the

Australian population; more health and social problems from alcohol occur in population groups most vulnerable to risk (National Drug Research Institute 2007). These conditions help clarify where alcohol policy opportunities lie and indicate the importance of both population level and targeted responses.

3.2.4 Patterns of Drinking and Risk

While the level of consumption is crucial to risk and harms from alcohol, patterns of drinking are a related policy concern. Drinking patterns are strongly associated with the physical and social environments where drinking takes place, the activities that accompany drinking, the personal characteristics of drinkers and their companions, and the types of beverages used (Rehm et al. 1996). Predominant drinking patterns have been recorded across countries and cultures over many centuries (Bloomfield et al. 2002; Room 1998). Drinking patterns are identified as a drinker risk, with a policy focus in both the current National Alcohol Strategy (National Drug Strategy 2006) and the National Preventative Health Strategy (National Preventative Health Taskforce 2009). A focus on drinking patterns represents a shift from drinking volume as the primary determinant of harms (Bobak 2005). A former National Alcohol Strategy refers to patterns of alcohol use as behaviour other than the level of drinking (National Drug Strategy 2001b). While this earlier definition helps to clarify the term, the current National Alcohol Strategy does little to add to an understanding of the concept.

A focus on drinking patterns could go unchallenged in alcohol policy discourse. Drinking patterns are significant markers of health and social problems from alcohol, and for monitoring the extent of risk from use (Rehm et al. 1996; Treno, Gruenewald & Ponicki 1997). Drinking patterns would *appear* to represent clear and concise data on which to base a range of policy measures, but alcohol volume is also important (Room 2005; World

Health Organization 2009a). ‘Drinking patterns’, as a research and policy indicator, is associated with ‘levels of consumption’; both need to receive alcohol policy attention. To the uninformed, a focus on drinking patterns in public alcohol policy presents no issue. Even so, if a broad evidence base is to be adopted for policy, the focus on drinking patterns needs to be enlarged to include other associated risks.

Restrictions on the level of availability and reductions in consumption are strong public alcohol policy levers. Attention on drinking patterns in alcohol policy is convenient for the alcohol industry; this helps absolve a level of public responsibility. The intrinsic properties of alcohol and the need for controls on per capita consumption are not emphasised under such a model (Stockwell 2004). Nonetheless, the thesis position concurs with Room: “drinking patterns have become, not a matter of science but rather an ideology” where “the world of research interacts with the political world” and “where alcohol industry interests have a deep concern with how their product is viewed” (Room 2005, p. 1803). Yet, a policy window of opportunity could open if a shift in public perception of alcohol occurs (Oliver 2006). Community pressure on governments to account for and prevent alcohol harms could alter the emphasis of public policy.

For the Australian population, current estimates of harm include both the quantity of alcohol intake and how often consumption occurs. In the most recent Australian Alcohol Guidelines, the quantity and frequency of alcohol consumption are converted to estimates of harmful exposure to alcohol (National Health and Medical Research Council 2009). This type of estimate, the *quantity–frequency* measure, is used to calculate the total volume of alcohol consumed (Bloomfield et al. 2003; Rehm 1998), as well as the potential for health harms (Rehm, Room, Graham, et al. 2003). Drinking patterns are also apparent from these estimates. In this regard, drinking guidelines provide governments and policy

makers with reliable evidence and knowledge regarding alcohol and help inform a direction for future alcohol policy in Australia.

3.2.5 Global Estimates of Harm

Alcohol presents a threat to public health and safety of a magnitude not readily envisaged by the average drinker. Alcohol problems are manifest globally; alcohol contributes to the prevalence of many health harms. As a causal risk factor, the use of alcohol impacts on world health status at a similar level to tobacco (Room, Babor & Rehm 2005). Evidence from a number of countries reveals a direct relationship between alcohol consumption and more than sixty medical conditions (World Health Organization Secretariat 2004). A range of physiological, behavioural and social harms are correlated with use (American Psychiatric Association 2000; Babor et al. 2003; Bruun et al. 1975; Jernigan et al. 2000; Marlatt et al. 1988; Norstrom & Ramstedt 2005; Rehm, Gmel, et al. 2003; Tiihonen et al. 1997).

At an international level, alcohol causes 1.8 million deaths annually - approximately 3.8% of all deaths - and is responsible for approximately four and a half percent of the global burden of disease (Rehm et al. 2009; World Health Organization 2011). The damaging effects of alcohol occur from both the level of consumption and the ways the beverage is used (Room, Babor & Rehm 2005). Unintentional alcohol related injuries account for approximately a third of the 1.8 million alcohol related deaths; neuropsychiatric conditions like alcohol dependence, psychoses and depression; and injuries from road traffic crashes, burns, drowning and falls contribute to reduced life expectancy, measured according to 'Disability Adjusted Life Years' (DALYs) (World Health Organization Secretariat 2004). Alongside these concerns, 76.3 million people worldwide have a diagnosable alcohol use disorder.

Health harms are evident in both developing and already developed countries (World Health Organization 2007b, 2011; World Health Organization Secretariat 2004). In developing countries, a trend of greater economic prosperity results in increased alcohol consumption and an escalation of population level and personal harms, as well as costs. In developing countries with low mortality rates, alcohol is responsible for approximately six percent of the DALYs lost and contributes to disability, disease, injury, and premature death more than any other risk factor. In developed countries, alcohol is responsible for over nine percent of annual DALYs lost. Of note, the harms associated with each litre of alcohol consumed are greater in poorer nations than in richer nations. Within a public health policy perspective, establishing the extent of alcohol problems requires accurate measurement and long term trend analysis.

3.2.6 Measuring Alcohol Related Risk and Harms

International surveillance and monitoring of alcohol availability, consumption and harms clarifies the extent of risk and harms from alcohol and provides much of the evidence for a global policy response. Alcohol related risk and harms are determined in a number of ways, with reliable processes established both internationally and in Australia. The WHO Global Information System provides key indicators to assess the alcohol related environment in member states (World Health Organization 2009b). These categories are: production and availability; levels of consumption; patterns of consumption; harms and consequences; economic aspects; alcohol control policies; prevention and treatment; and comparative risk assessment. Factors influencing the reliability of these key indicators include: unmeasured informal production; tourist consumption; stockpiling; waste and spillage; smuggling; duty free sales; and variation in beverage strength (World Health Organization 2009c).

At a national level, population evidence is important in establishing a direction for alcohol policy (Babor et al. 2003; Babor et al. 2010; Loxley et al. 2004). In Australia, core indicators for the measurement of alcohol related harms are: mortality; aetiological fractions; hospital morbidity data; night time assaults; and road crashes (National Drug Strategy 2001a). Additional measures vital to the estimation of harms are: preventable mortality; burden of disease; disability adjusted life years (DALY's); and avoidable hospitalisations (Begg et al. 2003). Of note, the current National Alcohol Strategy does little to define or address the majority of these indicators (National Drug Strategy 2006). Nevertheless, these various measures are central to the current investigation as they provide a lens through which the harms from alcohol can be viewed. Ideal alcohol policy would address these population indicators together with risky drinking behaviours; both are crucial to a public alcohol policy model.

3.2.7 Australian Estimates of Harm

Morbidity and mortality data reveals the success or otherwise of public alcohol policy in Australia. Within these parameters, the proportion of a condition attributable to alcohol is reported at the population level for persons aged 18 years and over (Ridolfo & Stevenson 2001). Percentages vary from an absolute relationship (100%) for conditions such as: alcohol beverage poisoning, alcohol cardiomyopathy, alcohol dependence, alcohol gastritis, alcohol cirrhosis, alcohol polyneuropathy, alcohol psychosis, and ethanol/methanol toxicity and poisoning; to chronic pancreatitis (84%); oesophageal varices - male (59%), female (56%); breast cancer in females (12.15%); haemorrhagic stroke in males (27%); as well as assault (47%); fire related injuries (44%); drowning (34%); driver/rider road accidents (up to 33%); and falls (between 4% and 22% dependent on gender and age).

Gender related mortality is estimated for Australia as follows (Ridolfo & Stevenson 2001): the largest proportion of alcohol related deaths for men is due to alcoholism and alcoholic liver cirrhosis; the second largest proportion is due to alcohol related cancers. Close to half (44%) of alcohol related cancer deaths in males result from oesophageal cancer; almost one quarter (24%) is due to liver cancer. The largest proportion of alcohol related deaths for females is related to cancer. Over half of these female deaths (55%) are due to breast cancer; with oesophageal and liver cancers accounting for 24% and 13% of deaths respectively. For men as well as women, the third largest category of alcohol related deaths is road injury. The prevalence of many chronic conditions, not only resulting from alcohol use but also coexisting with alcohol related disorders, adds to the extent of harms (National Drug and Alcohol Research Centre 2001). An additional problem associated with concurrent conditions is the use of alcohol with prescribed medications; interactions can alter the intended course of treatment (Weathermon & Crabb 1999).

Many of the harms attributable to alcohol are serious social problems (Fleming 2008; Gmel & Rehm 2003; Room 1998; World Health Organization 2009a). Social impacts include unintentional injuries, antisocial behaviours, aggression, violence, workplace absenteeism, decreased productivity, and child and spouse abuse. The causal association between alcohol use and violence is subject to scrutiny. When factors other than alcohol are controlled for, an independent effect of consumption on violent assault is still apparent (Ridolfo & Stevenson 2001). Confirming these findings, an Australian investigation reveals, in 60% of alcohol related homicides, both the victim and offender had consumed alcohol (Dearden & Payne 2009). An association between alcohol misuse and negative effect is likewise confirmed for nondrinkers (Gmel & Rehm 2003; Room, Laslett, et al. 2009). These 'second hand' effects are generally related to arguments, violent actions, verbal abuse, and family and marital problems (Giesbrecht, Cukier & Stevens 2010).

Many of these social problems require active policing, particularly in and around licensed premises (Fleming 2008). In some circumstances, alcohol consumption is a direct cause of violence (Bye 2007). Given strong links between alcohol use and numerous harms, the fiscal cost of alcohol use is an important public policy consideration.

3.2.8 Economic Costs of Consumption in Australia

The burden of alcohol impacts on the economy of Australia; many of these costs are inevitably borne by individuals. Outlays for alcohol have been estimated over a number of decades, primarily using a demographic approach (Collins & Lapsley 1996, 2002, 2008). Findings are as follows: between 1988 with a total estimated cost of \$3,147.1 million, and 1992 with a total of \$3,536.1 million, the tangible economic costs of alcohol have increased by 12.4%. However, at constant prices, with the effects of inflation removed, total tangible costs for 1992 are estimated as \$3,172.8 million; the real increase in costs is calculated as 0.8%. For the same period, intangible costs of alcohol abuse at current prices are estimated to have risen by 12.9%, but only by 1.2% when calculated at constant 1988 prices. At current prices, net health care costs related to alcohol rose from \$131.2 million in 1988, to an estimated \$145.3 million in 1992. Savings from premature deaths are included in these calculations. Total estimates of tangible and intangible costs of alcohol misuse in 1992, at constant 1988 prices, are in the magnitude of \$4,031.9 million, with an increase of approximately 0.9% over 1988 estimates (Collins & Lapsley 1996).

Avoidable tangible social costs of misuse are estimated at \$2,652.9 million (Collins & Lapsley 2002). Avoidable intangible social costs of alcohol misuse for the same period are \$1,275.9 million, or approximately 63.2% of the total intangible costs. These financial imposts represent 1.98% of the Gross Domestic Product for 1998-9. Costs of alcohol misuse in Australia, totalling \$6,120.6 million for 1998-9, are further described as the

tangible social costs borne by individuals - \$2,260.8 million; business - \$2,364.1 million; and government - \$1,495.7 million. Later, the total social costs from the misuse of alcohol in Australia are estimated as \$15.3 billion; intangible costs as \$4.5 billion; and paid and unpaid production costs as \$3.5 billion (Collins & Lapsley 2008). More recent estimates suggest alcohol costs the Australian population up to \$36 billion per annum; at least \$14 billion is attributed as harm to others; tangible and intangible costs to other than the drinker could be as much as \$20 billion per annum (Alcohol Education Research Foundation & Turning Point 2010). While alcohol problems and harms are clearly associated with economic costs, and a reduction in these outlays is a laudable policy goal, the main gain to be had in identifying these costs is to inform the prevention of alcohol related risk.

3.2.9 Contextualising Alcohol Associated Risk

The concept of 'risk' is explained in a number of ways. 'Risk' is defined as the probability of harmful consequences arising from a specific circumstance or hazard such as alcohol; a 'risk factor' is an aspect of personal behaviour or lifestyle, an environmental exposure, or an inherited characteristic associated with increased vulnerability (National Drug Strategy 2001b). 'Relative risk' is explained as the risk in a directly exposed group - *drinkers*, relative to the risk in those not directly exposed - *nondrinkers* (National Health and Medical Research Council 2009). Consistent with the inherent properties of alcohol previously discussed, all use carries some risk.

The proportion of the Australian population at risk of short term and long term harm indicates the challenge for future alcohol policy. Approximately thirty percent of the population is at risk of acute harms, and approximately twenty percent of the population is at risk of chronic harms (Australian Institute of Health and Welfare 2011). Results of

earlier research reveal: of the total volume of alcohol, approximately sixty-two percent is consumed at risk of short term harms; and forty-four percent is consumed at risk of long term harms (Chikritzhs et al. 2003). These estimates are based on the definition of alcohol risk from an earlier iteration of the Australian Alcohol Guidelines (National Health and Medical Research Council 2001).

Current National Alcohol Guidelines adopt stronger measures of risk (National Health and Medical Research Council 2009). These Guidelines emphasise the nature of alcohol as a beverage and the risks associated with use. Recommendations are: for healthy men and women, drinking no more than two standard drinks daily will reduce the lifetime risk of harm from alcohol related disease or injury. For healthy men and women, drinking no more than four standard drinks on a single occasion reduces the risk of alcohol related injury arising from that occasion. Children and young people under eighteen years of age are advised not to drink alcohol at all, as are pregnant and breastfeeding women.

Alcohol contributes to the burden of disease in Australia and is a specific risk factor for numerous conditions (Australian Institute of Health and Welfare 2010a). In the ten years between 1996 and 2005, approximately 32,696 Australians died from injury and disease related to risky/high risk drinking, and 813,072 were hospitalised due to alcohol related causes (National Drug Research Institute 2009). For this period, alcohol deaths declined but hospitalisations increased. The presentation of acute injuries at health care facilities - assaults, falls, and road injury that is not pedestrian related - accounts for much of the increase. These findings certainly validate national policy attention on the intrinsic properties of alcohol and on the various ways that alcohol is consumed. But, evidence cannot justify the overwhelming focus on intoxication apparent in the current alcohol Strategy (National Drug Strategy 2006). Policy attention should rather be directed towards

reducing the level of consumption. Another significant indicator of risk, also overlooked in the current Strategy, is the location where drinking takes place.

3.2.10 Drinking Location and Risk

Associations between drinking location and other risk factors like age, correspond with the experience of risk. Drinking location presents a particular risk for drinkers and provides a convenient focus for harm prevention activities. In the United Kingdom, the influence of drinking location on population subgroups indicates some variation in risk (Meier, Purshouse & Brennan 2010). 'Off trade' accounts for 61% and 'on trade' accounts for 39% of all alcohol consumed. Heavier drinkers prefer 'off trade' more often than moderate drinkers; young people prefer 'on trade' drinking, a predominant location in hazardous drinking in the under twenty-five years age group. Yet, choice of drinking location in the United Kingdom varies from Australia.

In Australia, drinkers most often consume alcohol in their own or a friend's home, limiting exposure to some categories of harm such as unprovoked violence from a stranger.

Approximately 79.1% of the Australian population report drinking in their own home; 44.3% at a friend's home; 42.4% at licensed premises; 41.3% at restaurants and cafes; and 40.0% at private parties (Australian Institute of Health and Welfare 2011). In 2008, approximately 7.3% of the population over fourteen years reported drinking at the following venues: workplaces; raves or dance parties; public places; in a car; at school, Technical and Further Education (TAFE) facilities, and university venues (Australian Institute of Health and Welfare 2008). A later report indicates a rise to 16.3% in the popularity of these drinking locations (Australian Institute of Health and Welfare 2011).

Older cohorts, the 30-39, 40-49, 50-59 and 60 years plus age groups, mostly drink at home (Australian Institute of Health and Welfare 2005a, 2008, 2011). Up to 2008, the 20-29

year old age group was more likely to drink in licensed premises, such as pubs and clubs, than in their own home or another's home; this situation is comparable to location preference in the United Kingdom (Meier, Purshouse & Brennan 2010). More recent evidence indicates, with increasing age, this age group drinks more often in their own home (Australian Institute of Health and Welfare 2011). The 2011 report shows young drinkers in the 12-17 years age group regularly drink at private parties, but with increasing age, drinking at home increases. Further research into different age cohorts and the risk levels associated with drinking location is needed. If such a study is pursued, greater specificity in alcohol policy could be possible, and some of the links between social drinking and risk may be better explained.

3.2.11 Sociability, Drinking Socially and Risk

Sociability, combined with social drinking, adds to the experience of problems with alcohol. The risks attending social availability, and the sense of obligation attached to drinking, can affect not only heavy drinkers but also consumption not presenting an immediate concern. Social availability refers to availability within small social or family groups (Smart 1977), as well as access in consumers' social environments (Gruenewald, Millar & Treno 1993). Other descriptions explain social availability as more akin to social norms and the perception of obligation within social contexts (Abbey et al. 1990a, 1990b). Abbey and others (1990) reveal social availability is positively related to alcohol consumption; social factors contribute to the amount of alcohol consumed. Consistent with these findings, significant correlations are evident between a number of social availability indicators and measures of alcohol consumption (Abbey, Scott & Smith 1993).

Being of a sociable nature and drinking in social situations invariably result in greater overall comfort with drinking, and, consequently, an increase in risk. Examination of the

social psychology dimensions of availability reveals sociability is a strong predictor of alcohol consumption (Rabow et al. 1982). The tradition of the ‘shout’ is an important component of sociability and the social availability of alcohol in Australia (Fitzgerald & Jordon 2009). Those who drink heavily generally surround themselves with others who drink heavily (Abbey, Scott & Smith 1993); ‘shouts’ can persist over many rounds. A social network of drinkers increases availability through social connections (Bruun et al. 1975; Skog 1985) and increases the risk of loss of control. Higher ingestion to the point of intoxication leads to a range of antisocial choices requiring police attention (Fleming 2008). These findings challenge the notion of social benefits from alcohol.

Added to these risks, a greater number and diversity of alcohol outlets create more social stratification. Theoretical work on the spatial ecology of alcohol problems shows social contact with at risk populations and drinking location preference result in greater risk of harm (Gruenewald 2007). A range of drinking venues ensures alcohol is available in just the right setting, with just the right atmosphere and arrangement of likeminded drinkers. Accordingly, ‘social drinking’ is an identifier or marker of group belonging (Fitzgerald & Jordon 2009).

The social context of drinking compounds the possibility of harms from alcohol, renders planning to drink a risky decision, and makes personal restraint much more difficult to achieve. Modest but consistent interrelationships are established between a sense of obligation to serve alcohol, drinking for social reasons, friends’ and co-workers’ drinking, and a willingness to travel or go out of the way to obtain alcohol (Abbey et al. 1990b). But neither sociability nor social availability is identified internationally (Babor et al. 2003; Babor et al. 2010) or locally (Loxley et al. 2004) as a reliable public alcohol policy focus.

Nonetheless, these are part of the many relationships between alcohol related risk and alcohol associated harms in Australia.

3.2.12 Group Effect on Risk

Drinking in groups adds to the risk associated with consumption, a policy problem not easily resolved given the social nature of drinking. Drinking is an individual act, but also a social behaviour (d'Abbs 2001). The immediate and personal effects of moderate consumption enhance socialisation and pleasure; when alcohol is consumed for communal enjoyment, a group effect is evident. Alcohol's effect on risk seeking behaviour is investigated in a group setting (Sayette et al. 2004). Results reveal, among American male drinkers, a risky option is more often chosen by alcohol using groups; the decisions made by drinkers are usually riskier than those of sober participants. According to these findings, the propensity to be 'risk averse' alters with alcohol use in group settings.

Testing these assumptions is a university based study in the United Kingdom (Abrams et al. 2006). Results reveal that, after consuming alcohol, the attractiveness of risky choices to individuals is enhanced; members of groups do not show this trend. Abrams and colleagues (2006) propose that groups may provide an informal means of mutual regulation, especially in situations where social drinking is moderate. Further investigation is required to establish the extent of these impacts. Even so, the circumstances of drinking groups are shown to alter vulnerability to risk (Abrams et al. 2006; Hothrow et al. 2007; Kuntsche et al. 2006; Sayette et al. 2004). Of note, the pattern of drinking among networks of peers is predictive of future drinking (Latkin 2010), and helps explain the regularity in drinking habits of some subpopulation groups.

However, in another United Kingdom investigation, alcohol intoxication correlates with a decline in cooperation within and between university student groups (Hothrow et al.

2007). Lending support to these findings, at risk groups are not necessarily homogeneous in their drinking motivations; differences are apparent with gender and age (Kuntsche et al. 2006). Nonetheless, risk occurs in small groups of drinkers, but also extends to larger aggregates of individuals such as subpopulations and societies (Skog 1985). Social pressures include the normative influence of peers with young people (Hughes et al. 2008), and the broad effects of historic culture, as described by others (Room 1998; Room & Makela 2000).

Alcohol prevention policies can result in a shift in social norms (Moskowitz 1989). However, Moskowitz (1989) does not recommend social norms as an alcohol policy focus; neither are prevention programs, based on attitudes and beliefs, afforded policy attention. But, the more others are thought to drink, the greater the individual level of consumption (Bertholet et al. 2010). These findings confirm the significance of the perception of others' drinking to the potential for risk and harms from alcohol. Yet, the effects of drinking in a group are not altogether clear and require further clarification before inclusion in public alcohol policy. What is certain is a number of population groups in Australia are particularly vulnerable to risk, essential targets for public alcohol policy.

3.2.13 Subpopulations at Risk in Australia

The harms experienced by subpopulations at risk contribute to the population burden of alcohol, but systematic policy to confront these risks is yet to be developed. The current National Alcohol Strategy identifies: Aboriginal and Torres Strait Islander peoples; pregnant women; prisoners; people with a mental health disorder; older people; heavy drinkers; and young people at higher risk from alcohol in Australia (National Drug Strategy 2001b). National statistics likewise reveal a number of groups at greater risk of harmful substance use, including alcohol (Australian Institute of Health and Welfare

2005b). These groups are: young people aged 12-19 years; Aboriginal and Torres Strait Islander peoples; pregnant and breastfeeding women; and homeless people.

Vulnerable population groups are afforded advice in the Australian Alcohol Guidelines for low risk drinking (National Health and Medical Research Council 2009). Children less than 18 years of age are advised not to drink at all, with similar advice for pregnant and breastfeeding women. Precautions are outlined for: taking part or supervising risky activities; use of illicit drugs concurrently with alcohol; young people; older people; and a family history of alcohol dependence. Additional advice is provided for people with a physical condition made worse by alcohol, people with mental health problems, and those using prescription medications.

Young people less than eighteen years of age, who are able to access alcohol, are at higher risk from consumption. Tests of the purchase capability of underage youth in the United States of America confirm widespread commercial availability for this category of drinker (Forster et al. 1995). In Oregon, community supply of alcohol to underage drinkers is directly associated with risky behaviours such as alcohol use, 'binge' drinking, consumption at school, and drink driving (Dent, Grube & Biglan 2005). Another American study reveals the risk of drinking intentions, increased alcohol use, drunkenness, and heavy episodic use when parents allow adolescent children to drink at home (Komro et al. 2007). This investigation focused on, primarily, a low income urban ethnic sample, so caution is needed in extrapolating these results to other population cohorts and to public alcohol policy more generally.

But, the observed drunkenness and intoxication of young drinkers across Australia and the violence and injuries that occur on a regular basis (National Drug Research Institute 2009) indicate that young people are in need of specific intervention. Young people are

particularly vulnerable to the harm producing effects of alcohol due to their maturational status when strengths and vulnerabilities are still somewhat fluid in the developing brain (White & Swartzwelder 2004). Approaches need to match the various ways youth consume alcohol as well as match their propensity for risk. Not drinking alcohol at all is the safest option for this age cohort (National Health and Medical Research Council 2009), unlikely to be popular as a public policy position.

Of concern, the current National Alcohol Strategy does not focus on the extent of harms for young people, the full range of population groups at particular risk from consumption, or alcohol specific interventions for the most vulnerable of drinkers (National Drug Strategy 2006). Rather, the public safety and sociocultural aspects of intoxication receive primary attention. Certainly, intoxication is worthy of special consideration. A focus on the subpopulation of drinkers involved in drunkenness and violent acts is essential. But, intoxication is not the only risky consumption behaviour. Risk extends beyond the issues of intoxication and violence to the many ways alcohol is made available and the variation evident in consumption behaviours. Some population groups are particularly vulnerable to alcohol and related effects; this knowledge is revisited throughout the thesis.

According to results of the literature review so far, the risk and harms from alcohol, both internationally and in Australia, are immense. Harms are likely on the increase, due to the levels and patterns of use as well as the risky behaviours associated with consumption. The prevalence of morbidity, mortality and related social consequences in Australia lends support to this assumption. The high levels of risk evident for vulnerable drinkers add further weight to this proposition. Thus, the intrinsic properties of alcohol, consumption levels, patterns of use, and risk of harms, together with associated fiscal costs, indicate the direction necessary for successful public alcohol policy in Australia. These problems

require a focus in future alcohol policy and an alcohol policy model. Nevertheless, if a comprehensive public policy is to be developed, the possible health advantages of alcohol consumption need to be balanced alongside the problems associated with use.

3.2.14 Reported Health Benefits of Alcohol Use

In contrast to the harms and costs associated with use, some benefits from alcohol consumption are reported. One of the most significant gains is a potential reduction in coronary heart disease (CHD) through regular light to moderate use. Benefits are thought to occur through the physiological impact of increased levels of high density lipoprotein (HDL) on heart functioning (Baum-Baicker 1985). Protective effects on a number of cardiovascular conditions, such as ischaemic heart disease and ischaemic and haemorrhagic stroke in females, are reported (English et al. 1995; Ridolfo & Stevenson 2001). Other health benefits include decreased platelet aggregation and coagulation, the improved management of HDL in diabetes, and a reduction in overall stress levels (Baum-Baicker 1985). Some effect is apparent between a moderate wine intake and a reduced risk of dementia (Luchsinger et al. 2004).

Associations are evident between alcohol consumption, plasma lipoprotein levels and myocardial infarct (Gaziano et al. 1993). These links are demonstrated in a sample of 340 patients with history of an infarct. An equal number of age and gender matched controls participated in the study. Analysis reveals an inverse association between the moderate intake of alcohol and the risk of a 'heart attack'. Alteration in plasma lipoprotein levels is the significant mechanism affecting these health changes. The benefits of alcohol consumption are shown to be mediated, to some extent, by increases in HDL levels. Another investigation reveals light to moderate drinking, when compared with abstinence, is related to lower risk for CHD and mortality; the lowest level of risk is demonstrated at

twenty grams of alcohol, or two standard drinks per day (Rehm, Gmel, et al. 2003).

Findings reveal the risk relationship between alcohol consumption and CHD reverses with heavy drinking (Rehm, Gmel, et al. 2003).

Health benefits are further confirmed in a prospective cohort study (Carmago et al. 1997).

According to results, a reduced risk of angina and 'heart attack' is possible for males who consume one drink a day. These associations remain when either nondrinkers or occasional drinkers are used as the reference group. A later investigation demonstrates a possible net benefit to health from moderate drinking (Thakker 1998). A more recent study shows moderate alcohol intake on three to four days per week correlates with lower risk of myocardial infarct for both males and females (Mukamal et al. 2005). Other findings show a genetic basis for reduced overall risk of myocardial infarct (Hines et al. 2001).

Providing additional weight to the evidence, the 'Framingham Heart Study', with a cohort of 5,209 subjects aged between 28 and 62 years, reported protective effects from alcohol use (Djousse et al. 2000). Relationships between consumption, the type of alcoholic beverage, and peripheral arterial disease, as predictors of myocardial infarction and stroke, were researched. The protective effects of moderate alcohol consumption on the development of intermittent claudication are confirmed through these findings. Benefits are primarily associated with the consumption of beer and wine. In another study, advantage from moderate alcohol intake seems most prominent in those drinkers with poor health behaviour, who engage in very little exercise, are smokers, and have a poor diet (Britton, Marmot & Shipley 2008). These findings render policy advice of alcohol use for heart health as highly problematic. While the evidence appears to be strong regarding

heart benefit from low consumption, engaging in regular exercise, quitting smoking and improving diet could advantage the heart as much as the uptake of low levels of alcohol.

3.2.15 Challenge to Previous Findings of Health Benefits

Challenge is made to the report of health gains from alcohol consumption.

Notwithstanding the earlier evidence of heart benefits from light to moderate consumption, these findings are now disputed. In a Scottish sample of 5,766 men aged 35 to 64 years, mortality from CHD and stroke in relation to alcohol consumption is investigated (Hart et al. 1999). No evidence is found of a strong relationship between the amount of alcohol consumed and mortality from CHD, despite adjustment for potential confounders. While a positive relationship is demonstrated between level of consumption and risk of mortality from stroke, no protective benefit is evident for men drinking less than 22 units per week. These latter results are contrary to evidence of a protective effect from moderate alcohol intake (Baum-Baicker 1985; Carmago et al. 1997; Gaziano et al. 1993; Hines et al. 2001; Mukamal et al. 2005; Rehm, Gmel, et al. 2003).

In another study, changes in consumption trends, drinking patterns, alcohol problems and alcohol policies in fourteen European Union countries are analysed, with no demonstrable benefit to the heart (Apfel & Andkjaer 2001). A more recent analysis of fifty-four previously conducted investigations explores correlations between consumption level and risk of premature death from all causes, including heart disease (Fillmore et al. 2006). The focus of this investigation is a number of prospective studies reporting 'light' or 'moderate' regular use of alcohol as a protective factor for CHD. For the studies reviewed, methodological concerns are raised regarding inclusion in the 'abstainer group' of research participants who had cut down or stopped drinking altogether, due to declining health, medication use or disability. The concept of 'abstainer error', first proposed by Dr Gerry

Shaper of the Royal Free and University College Medical School in London, is thought to account for the discrepancy (Shaper 1993). It is further determined, from the seven studies not demonstrating ‘abstainer error’, that a reduction in mortality risk cannot be assured for light drinkers when compared with abstainers (Fillmore et al. 2006). It is also evident that drinkers in the abstainer group, who had reduced their intake due to poor health and age related factors, are at elevated coronary risk due to illness, rather than the absence of the consumption of alcohol. The issues raised concerning ‘abstainer error’ concur with Australian research showing ill health can lead to a choice to reduce, or cease alcohol consumption altogether (Liang & Chikritzhs 2010). Concluding comments of Fillmore and others (2006) suggest the benefits of light drinking to longer life are likely exaggerated.

Unmistakably, the benefits of alcohol consumption require further research and analysis before inclusion in public alcohol policy. The promotion of health gains from alcohol use should not form part of a public policy platform for Australia until such time as more definitive results are established. Rather, policy built on reliable evidence is the preferable strategic aim. Policy that seeks not only to reduce harm but reduce risk is the more rational approach for a legal product like alcohol. The next section of the literature review explores a related challenge - how the frame chosen for alcohol policy strongly contributes to the risk and harms so prevalent in Australia.

3.3 The Problems Associated with Alcohol: Framing Policy for Alcohol

3.3.1 Choice of an Alcohol Policy Frame

Choosing the most effective frame for alcohol policy can be difficult. Alcohol is one of many ‘wicked’ community problems beset by controversy (Schon & Martin 1994). The

debates surrounding alcohol are multifaceted in origin and not easy to resolve. Some problems are highly resistant to evidence, reason, or even cogent argument. Policy controversy, as proposed by Schon and Martin (1994), rests on the ‘underlying structures of belief, perception and appreciation’, referred to as frames. Variation in frames of reference is part of the contest between policy agendas, policy players, and policy outcomes. A preferred policy frame can be driven by personal interest, community interest, ethical consideration, reference to ‘truth’ or economic benefit. In approaching public policy, three main traditions are evident: policy science where policy makers are considered rational in their actions and policy conflicts disappear in the face of evidence; the idea of politics as a pluralistic model balancing conflicting values and interest; and dispute resolution involving the ‘practice of mediated negotiation rooted in economic rationality’ (Schon & Martin 1994). Application of each of these frames of reference could see different policy directions emerge from the same policy problem. Even so, if the risk and harms from alcohol are to be reversed, the framing of alcohol policy in Australia needs careful revision.

Within this context, “frames are not free floating but are grounded in the institutions that sponsor them, and policy controversies are disputes among institutional actors who sponsor conflicting frames” (Schon & Martin 1994, p. 29). These authors propose an institutional action frame encompasses the beliefs, values and perspectives of policy organisations or influential policy groups. They also describe metacultural frames as enduring over time, giving meaning and normative direction to policy thinking and actions. Within the alcohol policy arena, different government departments frame alcohol problems to suit their particular corporate agenda. The policing perspective views alcohol as primarily related to violence and antisocial behaviour (Fleming 2008). From another perspective, alcohol is viewed as a boost to tourism, hospitality and, inevitably, as a

revenue raiser. Within a public health policy framework, alcohol is considered a threat to the health and wellbeing of populations (Rehm, Room, Monteiro, et al. 2003; Room, Babor & Rehm 2005).

Disputes are common in the quest for policy dominance and workable policy solutions (Schon & Martin 1994). Contestable differences between policy players can conceal a bid for control of the policy making process; control of budget allocations can be a related aim. Schon and Martin (1994) propose the focus of policy players likely differs due to the extent that evidence supports a preferred policy position, or as a result of variation in interpreting research findings. When policy contentions endure, the resultant outcome can be a 'stalemate' or 'pendulum swings' of extremes, strongly influenced by the political party in power (Schon & Martin 1994). Adding to these tensions, the general policy environment can alter, as occurred with the introduction of the National Competition Policy in 1995 (National Competition Council 1995). Hill and Hupe (2009) emphasise the embedded market paradigm, representing what governments are legitimately able to accomplish and what can be left to market forces. Governments can be reluctant to interfere in business markets; they obfuscate responsibility to reduce supply and consumption, thereby ignoring a powerful frame for public alcohol policy.

A reframe of a contestable policy area, such as alcohol, can be achieved; this may not resolve, but rather provoke further policy controversy (Schon & Martin 1994). A reframe could mean revisiting the attitudes, beliefs, social norms and perceptions underpinning public alcohol policy to achieve a new set of policy agendas. A reframe may result in reassessing the gains to be achieved within a particular political environment. A reframe of public alcohol policy can also mean revisiting the expectations surrounding alcohol as well as the potential outcomes from a particular policy stance. In some cases, what may be

needed is a combination of an old and new frame (Schon & Martin 1994), or integration of two seemingly disparate frames. Nonetheless, policy failure can result from a lack of reliable evidence for a chosen policy position. This is nowhere more apparent than for the current National Alcohol Strategy for Australia (National Drug Strategy 2006).

3.3.2 National Alcohol Policy: Harm Reduction and Sociocultural Frame

The adoption of a *harm reduction* philosophy for alcohol and drug policy in Australia represents an attempt to broaden the focus of governments in response to substance use and harms. Even so, '*harm minimisation*' has formed the basis of much substance policy in Australia since 1985 (Lenton & Single 1998; Wellbourne-Wood 1999). Harm minimisation is conceptualised as a combination of supply reduction, demand reduction and harm reduction strategies, a mantra discussed in the current National Alcohol Strategy (National Drug Strategy 2006). Harm reduction, like harm minimisation, draws a distinction between the use of a substance on the one hand and the harms than result on the other. Despite the hope of a broadened focus through adoption of a harm reduction emphasis, a narrowing has occurred in the range of approaches applied at the national level. Supply reduction and demand reduction are not adequately addressed.

Harm reduction is discussed in the literature as a value neutral framework that affords a public health stance, certainly strategic, but nonetheless politically prudent (Hathaway 2005). Moreover, harm reduction is described as "a set of programs that share certain public health goals and assumptions", though not necessarily well understood (MacCoun 1998, p. 1199). Central among the tenets of harm reduction is the modification of drinkers' behaviour and the conditions of use to reduce the most serious risks to public health (MacCoun 1998). As a frame of reference, harm reduction does not require abstinence, or reduction, or cessation in use (Roche, Evans & Stanton 1997). "Harm

reduction was a clear challenge to other approaches to drug use” (Stimson & O'Hare 2010, p. 92). In a therapeutic context, harm reduction results in outcomes such as limits to consumption and harmful effects (Marlatt & Witkiewitz 2002). In treatment settings, harm reduction enables a more ethical approach to users and goals other than abstinence (Wellbourne-Wood 1999), and is an important policy advance in the face of ongoing use (Lenton & Single 1998).

Concerns are raised regarding the widespread adoption of harm reduction principles in public alcohol policy; a false application of harm reduction results in a focus on high risk drinking patterns rather than total population consumption (Stockwell 2004). A harm reduction framework could be considered a clearly evidenced way to address population level problems and advance policy concerns. Harm reduction is welcomed as a policy framework for the substance use area, gaining support from a range of experts and lay persons in the alcohol and other drugs field. Harm reduction is considered by many as a ‘global panacea’ for all substance use problems (Roche, Evans & Stanton 1997). The prevalence of this belief extends from politicians, policy makers and researchers, to managers and staff of government departments and community organisations.

But, harm reduction as a philosophy remains contestable in both policy and treatment contexts. Attention is drawn to the difference between harm reduction as a broad policy goal and harm reduction as an intervention strategy (Lenton & Single 1998). Miller (2001) suggests an absence of theoretical rigour for harm reduction results in failure to adequately deal with discourse in the alcohol policy arena, and that a considerable number of the claims made by supporters of harm reduction are idealistic or essentially defective. Within a harm reduction framework, many important issues are overlooked including policy supporting a use reduction stance (Roche, Evans & Stanton 1997). Others believe the

measures associated with harm reduction are lacking precision (Caulkins & Reuter 1997). Harm reduction can be construed as endorsement, or at best, absence of censure of use (MacCoun 1998). MacCoun (1998) further argues that an increase in consumption and harms is a likely outcome from the adoption of a harm reduction position.

Universal support for a harm reduction framework for alcohol policy is lacking. The status of alcohol as a legal product, and commercial availability as a market driven reality, require a policy model that organises and accommodates the complexities of legal access as well as those of safer use. Harm reduction cannot provide a complete framework for alcohol and other drugs policy (Roche, Evans & Stanton 1997). Stockwell (2004) recommends harm reduction approaches in policy be supported by controls on the physical and economic availability of alcohol. In addition, the success of a harm reduction approach relies on behavioural responses to strategic policy as well as to program intervention (MacCoun 1998). A 'harm reduction' philosophy represents a challenge to the public health framing of alcohol policy; a reduction in population consumption is evidenced to prevent and reduce alcohol associated harms (Stockwell 2004).

An additional hindrance to good strategic outcomes is the sociocultural focus of current alcohol policy (National Drug Strategy 2006). Social culture has been put forward as the principal mediator of risk; improvement in drinking culture is seen as a logical policy aim (Roche et al. 2005). Drinking culture is particularly important to youth consumption and related harms (Lindsay 2005). However, despite a strong focus on the cultural aspects of drinking, a definition for an *ideal* drinking culture is missing from the Strategy (National Drug Strategy 2006). According to Peel (1997), social engineering efforts aimed at the cultural aspects of consumption can be futile, especially if directed in abstract ways. An aim to 'improve drinking culture' in the current Strategy, without reducing availability and

consumption, is a case in point. The predictive value of culture on consumption is not clearly established in epidemiological models (Peel 1997).

Nonetheless, Room and Makela (2000) examine the cultural position of drinking and compare abstinent traditions with other prescriptive cultures, where drinking and daily life are intertwined, but drunkenness and loss of control are unacceptable. These authors define the cultural position of drinking as readily distinguishable: “abstinent societies; constrained ritual drinking; banalized drinking; and fiesta drunkenness”; but insist “a large residual category remains” (Room & Makela 2000, p. 475). Even so, cultural organisation is more social in structure, with opportunities and constraints all part of belonging to the group (Rayner 1992). In this respect, all members of a particular society are directly or indirectly affected by others in that culture, but the extent of influence depends upon the strength or weakness of social relations and network ties (Skog 1985).

Also posited as meaningful to the cultural debate is the centrality or marginality of drinking groups to a society, as well as the extent to which drinking occasions are integrated or separated from cultural definition (Room & Makela 2000). These authors propose that drinking customs in every society are bound up with general cultural dynamics; cultural norms can generate pressure towards an expectation of heavy drinking. Also proposed is an additional set of dimensions: “the cultural position of the drinker, the drinking group, and the drinking occasion” (p. 482); important to disentangling the drinking context. They also argue the ‘regularity of drinking’ and ‘extent of drunkenness’ are more useful alcohol policy dimensions than the cultural position of drinking.

Drinking culture may hold some validity with drinkers, but will not form the basis of a drinking revolution that embraces low levels of use. “Not all individual differences measurable within cultures can be established cross culturally with society wide data”

(Peel 1997, p. 62). In addition, there is “no single dimension likely to be able to capture the diversity of factors involved in the cultural position of drinking” (Room & Makela 2000, p. 480). Also, the cultural meaning of alcohol changes throughout the life cycle with variation evident between the genders (Babor et al. 2003). Change in drinking culture could be a longer term policy goal, but addressing availability and price are more pressing concerns in the short to medium term (Marmot 2004b). Consistent with a treatise of cultural theory and risk analysis, culture can be both formal and informal, with loose or strong ties between cultural constituents (Rayner 1992). Thus a cultural frame lacks the stability and consistency necessary for public alcohol policy. Other approaches need to be identified if a new model for alcohol policy is to be formed. However, the need to change the drinking culture in Australia is a concept that the community understands and is able to resonate with.

A sociocultural focus within a harm reduction framework is not a wise pathway for public alcohol policy. Within this milieu, alcohol is not viewed as the primary source of risk from drinking. Harms are appropriated to the way alcohol is used, not to the intrinsic properties of the beverage. Under such a framework, those manufacturing and selling alcohol cannot be held responsible for related risk and harms, a situation that removes pressure from governments and the alcohol industry. These circumstances cannot continue. Strategic planning for alcohol needs to provide relief for communities and respite for vulnerable drinkers. An ordered approach to alcohol policy could be best, where change is rationally pursued and policy impacts are regularly monitored. The next section of the literature review analyses the evidence for strong public alcohol policy and examines the most powerful policy levers to achieve sustainable change. An important consideration in examining the evidence further is to determine how an alternate public alcohol policy model, to current policy framing, can be developed for Australia.

3.4 Potential Policy Solutions: The Environmental Context of Alcohol Use

3.4.1 Overview

Public alcohol policy is complex to form and demanding to implement in ways that facilitate long lasting change. Potential alcohol policy solutions are investigated in two main sections: *The Environmental Context of Alcohol Use*; and *The Behavioural Attributes of Consumption*. It is these two sections of the literature review that inform how public alcohol policy can be framed and policy outcomes improved. These areas also help direct the investigation of theory for the development of a public alcohol policy model, pursued in latter chapters of the thesis.

3.4.2 Population Availability and Economic Availability

A body of knowledge is already to hand to form strong public alcohol policy. Evidence supports the general supply and availability of alcohol as important to public policy direction. Availability of alcohol has been acknowledged as a significant indicator of alcohol consumption and related harms over many decades (Bruun et al. 1975; Single 1988; Stockwell & Gruenewald 2001). Availability as a concept represents how easy it is to obtain alcohol in a physical, economic and legal sense (Babor et al. 2003; Babor et al. 2010; Loxley et al. 2004). Availability is related to all the control policies made by governments, the physical and legal arrangements enabling the purchase and consumption of alcohol (Smart 1977). Availability is further explained in social terms (Moskowitz 1989), representing access to alcohol in social circumstances and community setting.

In support of availability as crucial to alcohol policy, a level of consistency is evident between alcohol availability measures outlined in an Australian monograph (Loxley et al. 2004) and strategies espoused by Bruun and colleagues (Bruun et al. 1975) and Babor and

associates (Babor et al. 2003; Babor et al. 2010). Regulation of *physical availability* is achieved through: legislation; taxation and excise measures; minimum legal purchase age; enforcement of liquor laws; server liability; restrictions on hours and days of sale; restrictions on the density of outlets; and consideration of differences with regards to alcohol strength (National Preventative Health Taskforce 2009). The most effective strategies to reduce the *economic availability* of alcohol are taxation and other measures which increase the cost of purchase, and render alcohol less affordable and therefore less financially available (Babor et al. 2003; Babor et al. 2010; Room, Babor & Rehm 2005). Those legislative policy levers with the greatest impact on availability for high risk drinkers include server liability and a minimum legal purchase age (Babor et al. 2003; Babor et al. 2010).

In an American context, availability is conceptualised as all the legislative arrangements determining access: “off premise sales; hours and days of sale; population restrictions; restrictions on servers; forms of ‘on premise’ sales; criminal penalties; administrative penalties; authority to enforce alcohol control laws; dram shop liability; and local control” (Janes & Gruenewald 1991, pp. 203, 204). Janes and Gruenewald (1991) further define availability as: price restrictions; excise taxes; price advertising; and other pricing control measures. Yet, amendments to legislation and taxation reform can take years to accomplish. As an alternate policy measure, immediate and beneficial change can be achieved through more effective enforcement of the laws already in existence (Stockwell & Gruenewald 2001). Hence, there is some certainty in strategies to reduce availability, representing an important contribution to public health policy solutions associated with alcohol.

Taking these findings into account, a reduction in availability is a powerful policy lever to challenge the risk and harms from alcohol. Broad structural frameworks and local access arrangements affect the extent of availability as well as harms at both population and community levels. But, as research shows, there is much variability in the effects of decreased physical and economic availability at the point of purchase; the consequence of a reduction in physical availability in the near vicinity could be the integration of alcohol purchases with other essentials like groceries (Gruenewald & Treno 2000). This outcome reduces the real cost and effort required to access alcohol (Abbey, Scott & Smith 1993; Room, Osterberg, et al. 2009). Yet, price increases at local outlets can result in a switch to cheaper alcohol products.

Other perspectives on the effect of price show price elasticities vary between countries, but pricing changes do not always produce a corresponding change in net consumption (Room, Osterberg, et al. 2009). These authors provide examples of Sweden and Denmark, where saturation point for alcohol is thought to have occurred and population consumption stasis is now reached. They suggest the influence of price varies between poor and affluent drinkers; change in price has a greater effect on the young. However, price elasticities can result from wider social, cultural and economic circumstances and are not an attribute of alcohol as a beverage (Osterberg 2001). Pricing changes have differential effects from those of general physical availability, at least on subpopulations of drinkers (Makela 2002). Purchasing power in relation to income also has an effect, with the economics of purchase remaining influential up to a certain level (Room, Osterberg, et al. 2009).

Culmination of the paper by Room and others (2009) is a model suggesting:

“taxes, control on availability and societal responses to alcohol problems push down the real level of alcohol available for consumption; greater availability and access, purchasing power, and promotion and advertising increase the level; while cultural customs and habits, and structural changes such as urbanisation or change in gender functioning in society, drinking norms and cultural politics affect the level of alcohol in ways that are not predictable” (p. 571).

The importance of pricing policy is not negated by experiences in Sweden and Denmark where stasis is reached; findings highlight the need for sizable price changes to withstand the effects of counter influences (Holder 2009). According to some, saturation is a crude measure lacking explanatory power (McCambridge & Kypros 2009). But, saturation point is likely now reached in alcohol promotion and sponsorship arrangements associated with sporting events (Sherriff & Griffiths 2010), a concept easily understood. Nonetheless, Holder (2009) considers the position of Room and colleagues (2009) supportive of a theoretical perspective on complex alcohol systems, but questions the need for a full understanding of pricing and other matters to reduce associated harms. Moreover, the whole supply and marketing side of alcohol is as much about the way alcohol is used as it is about its regulation (Sulkunen 2009).

Even so, for some individuals, the availability and affordability of alcohol do not always translate to consumption or to the experience of harms. While restricting access and lowering availability are powerful interventions, these interrelationships are highly complex (Stockwell & Gruenewald 2001). Review of the pricing literature shows an inverse relationship between drinking and price: increased price is considered as an

effective policy response to alcohol use and harms (Wagenaar, Salois & Komro 2009).

But, the effects of pricing policies vary between product types, point of sale and drinking venues (Meier, Purshouse & Brennan 2010). Meier and colleagues (2010) concur that population groups are differentially affected by price, due to diverse risk profiles related to alcohol; the effects of pricing policies on alcohol related harms are likewise variable.

Taking the evidence into account, control of the availability of alcohol through physical, economic and legal means is an important public health goal (Babor et al. 2003; Babor et al. 2010; Bruun et al. 1975; d'Abbs 2001; Edwards et al. 1995; Groves 2010; Single 1988; Stockwell & Gruenewald 2001). Yet, the heterogeneity required in pricing policy across populations (Meier, Purshouse & Brennan 2010) makes the development of a retail pricing index by government a complex undertaking. Some connections are presumed between the more global perspectives of government control systems and local response mechanisms (Gruenewald & Treno 2000). But the connections between availability as supply, and consumer demand are not unidirectional; change in national acceptance of alcohol is often responsible for increased demand (Edwards & Holder 2000), or indeed, decline.

Nonetheless, price does bring about some change in acceptability and demand, at the very least, at the household budget level. Disposable income is strongly related to access to alcohol through economic means (Moskowitz 1989); the greater the amount of disposable income, the greater the likelihood of purchase and consumption. Consistent with this position, financial benefits are seen by Australians as one of the gains from reducing consumption or abstaining from use (National Drug Strategy 2002). But, as early as the 1970s, a focus on price in alcohol control policy was seen as weak and inconclusive (Parker & Harman 1978). This position does not however negate the importance of the

economic availability of alcohol as significant to alcohol use (Babor et al. 2003; Loxley et al. 2004; Room, Babor & Rehm 2005). Similarly, the viewpoint of Parker and Harman (1978) does not preclude use of a range of evidenced availability measures to reduce the risk and harms from alcohol (National Preventative Health Taskforce 2008).

Limits to all forms of alcohol availability offer strong protective effects to the general population (World Health Organization 2007b). Some variability in the impact of availability is due to personal attributes related to drinking, reasons for drinking, previous experiences with alcohol, and a number of other factors (National Health and Medical Research Council 2009). Research covered earlier in the literature review suggests where drinking occurs and who drinkers associate with also influence vulnerability to risk. Thus the immediate effects of physical availability are altered. Moreover, it is possible that strong measures to reduce availability will assist drinkers to control uptake as well as intake, irrespective of other factors that contribute to harm. Such an approach represents an effective demand reduction strategy. But, as the next section shows, policy effort by governments to control availability and reduce demand are countered by industry advertising that seeks to influence perception of alcohol as a beverage, and perception of alcohol's availability.

3.4.3 Perceptions of Availability: Alcohol Marketing, Advertising and Counter Advertising

A key policy tactic of the alcohol industry is to ensure the positive perception of alcohol. This goal is achieved through product advertising, marketing and promotion, and the depiction of behaviours associated with drinking in ways that encourage use. These dealings are part of an overall business approach to ensure that alcohol remains a highly acceptable product, to strengthen the viability of alcohol in the marketplace, and to increase product market share. The founding of the World Trade Organization (WTO) in

the 1990s is a pivotal point in setting the global agenda (Gould 2005), whereby the maintenance of global trade is supported by a free and open market economy. This crucial decision in the history of alcohol availability lends support to advertising and marketing strategies. International trade treaties represent a considerable challenge to restrictions on alcohol advertising.

There is little doubt that a ban on advertising and marketing of alcohol contravenes world trade practices. “The various interests that profit from alcohol sales have good reason to believe broadened trade rules could end the debate over alcohol advertising” (Gould 2005, p. 360). Yet, uncertainty for regulators persists. Gould (2005) identifies a number of challenges to health protection regulation, and government maintenance of regulation, in the face of trade liberalisation. New and largely unevaluated technologies present an additional problem for regulators and for public alcohol policy; a global response to this emerging issue is needed (Casswell & Maxwell 2005). These authors state “new products have led to new levels of inventiveness in naming and packaging” (p. 345), making regulation much more complicated. They also propose: current attempts at regulation ignore the full marketing mix evident; a global approach needs to set clear limits on alcohol marketing, and conceptual and methodological difficulties abound in measuring the effects of advertising bans.

The results of advertising and marketing are not always clear. Positive associations with a range of drinking patterns and consumption measures are observed in Australia (Jones & Magee 2011). Motor vehicle fatalities are reduced through alcohol advertising bans; elimination of the tax deductibility of advertising is another potential policy approach (Saffer 1997). Content of advertising is important in analysis that seeks to determine these connections (Finn & Strickland 1982; Strickland, Finn & Lambert 1982), as is the

frequency and nature of advertising (Madden & Grube 1994). But, much research fails to investigate the complexities of these relationships; positive correlations can be hard to demonstrate. Reference to decision making processes reveals connections between media alcohol portrayal and children's drinking, but, analysis of exposure and effect often underestimates the full extent of influence (Austin, Chen & Grube 2006). "Some results are suggestive there is a need for more sophisticated econometric, exposure and experimental studies that take into account a wider range of variables" (Smart 1988, p. 314).

Overall, the effects of advertising are inconsistent (Collins et al. 2007). Differences are evident between drinking groups; heavy drinkers and those with positive expectancies of future drinking most often expose themselves to alcohol advertising and have stronger recall of advertising content (Smart 1988). Variation is evident between the forms of advertising and incremental effects on youth. Collins and others (2007) show that drinking and driving intentions are predicted through ownership of a hat, poster or shirt advertising alcohol; some other forms of advertising show little or no influence. Concerns are raised regarding sponsorship of events where children and adolescents are present (Davoren & Sinclair 2012), as well as the negative effect on the drinking habits of sports people (O'Brien et al. 2011). Within these various contexts, alcohol advertisers are well aware of the demographics of alcohol consumption across different population groups and pitch their efforts accordingly, cause for much public health disquiet (Garfield, Chung & Rathouz 2003). Yet, scepticism regarding advertising claims is a protective factor reducing risk from the media message (Austin, Chen & Grube 2006).

The appeal of advertising content to vulnerable target groups, like young people, is in need of a new policy response (Casswell & Maxwell 2005). Links between an awareness of

alcohol marketing, drinking intentions and drinking behaviours are well established for the young (Gordon et al. 2010). The likelihood that adolescents will use alcohol, and if they already use will consume more, increases with exposure to advertising and promotion (Anderson et al. 2009). “The tragedy from alcohol use often hits earlier in life than other preventable health risks” (Kessler 2005, p. 294), necessitating the restriction of advertising to young people. Increased exposure to a variety of media, such as music video and television coverage of alcohol use, is a risk factor in adolescence (Robinson, Chen & Killen 1998). Adolescent drinking is predicted from multiple modes of advertising; prior experience with alcohol determines the source of advertising as the predominant influence (Ellickson et al. 2005). For example, brand allegiance and a predilection for broadcast alcohol advertisements at eighteen years influence the volume of beer consumed at twenty-one years of age (Casswell & Zhang 1998). Movie portrayal of alcohol and drinking leads to higher consumption in young adult males (Engels et al. 2009). Of note, the perceived consequences of drinking, as alcohol expectancies, remain an important pathway of media influence; these require future research to determine the extent of effect (Collins et al. 2007).

Despite alcohol advertising likely increasing overall consumption and misuse, especially for the young, bans on advertising have little effect. Retail discounting and coupons are used as successful industry responses (Saffer 2002). In the words of Saffer (2002), “counter advertising, rather than new advertising bans, is the better choice for public policy” (p. 173). There is interest in health as a ‘good’ (Godfrey 1989), presenting untold opportunity for the promotion of public health messages and public health policy for alcohol. Counter messaging by public health officials is a largely untried and untested area for alcohol intervention in Australia. Some media messages emphasising alcohol harms have been broadcast, but with little, if any, long term effect. As a related issue, a recent

review of food labelling law and policy recommends that general health warning messages be placed on alcohol labels, as well as specific pregnancy related warnings (Commonwealth of Australia 2011). It is yet to be seen how all the recommendations of the Blewett Review of Food Labelling Law and Policy (Blewett et al. 2011) are finally actioned by the Australian Government and if the mandatory labelling of alcohol with general health warnings is eventually able to be brought into effect. Policy communities continue to advocate for the Australian Government to take full control of the alcohol labelling agenda (Foundation for Alcohol Research & Education 2012b). The wording of general health warning labels is yet to be decided, and will persist as a contestable area between government players and industry representatives.

The brewer Lion Nathan promised to voluntarily adopt consumer health messages in support of responsible drinking choices (Hagan & Miletic 2011). This decision provides the multinational company with a 'head start', and will afford further opportunity for business control of alcohol messages. Nonetheless, problems abound with the partial labelling of some alcohol products and not others. Uninformed drinkers may avoid labelled products and choose those with no displayed health warnings (Agostinelli & Grube 2002). This choice can lead to unintended harms, especially related to pregnancy. Research referred to by Agostinelli and Grube (2002) indicates both cognitive and affective factors are important in the impact of alcohol labelling; visceral responses to words such as 'poison' and 'cancer' produce greater avoidance behaviour than the more general warnings of 'harm to health', at least in a sample of college and high school students. These authors also state "taken together, the accumulated evidence suggests that warning labels are being noticed and their content is remembered" (p. 19). This being so, there is a 'duty of care' on the part of governments and public health officials to inform the general public of the risks associated with alcohol, irrespective of whether these warnings

are heeded and despite an industry preference. Such warnings need to be backed up by sustained policy effort to address other influences, such as situational availability and improved health from reduced consumption.

3.4.4 Situational Availability and Risk

Outlet Density

Research supports the relevance of situational availability to a renewed policy framework for alcohol. Contributing to the overall availability of alcohol for populations, supply and access in community settings and local situations is now investigated. A number of indicators are important to this inquiry. At a local level, access and availability is primarily governed by hours and days of sale, outlet density, liquor licensing requirements, and legal drinking age (Babor et al. 2003; Chikritzhs & Stockwell 2002; Loxley et al. 2004; National Preventative Health Taskforce 2008; Popova et al. 2009). A number of cross sectional studies show correlations between licensed outlet density, alcohol consumption and a range of alcohol harms (Single 1988; Stockwell & Gruenewald 2001). Outlet density per head of population is used as an availability measure in research reviewed by Stockwell and Gruenewald (2001). The primary risks associated with outlet density are violence, assault, and intoxication (Chikritzhs et al. 2007; Gruenewald et al. 2006; Livingston, Chikritzhs & Room 2007; Zhu, Gorman & Horel 2004).

But, research is unable to explain whether increased liquor outlet density stimulates demand or whether higher demand stimulates increased outlets (Stockwell & Gruenewald 2001). Australian research demonstrates an extension of ‘off premise’ liquor licenses, such as those for grocery stores and supermarkets, leads to increased consumption of wine and more convictions of drunkenness (Smith 1983). In addition, density of alcohol outlets is clearly associated with teenage alcohol consumption; living within a ten minute drive of

more outlets results in larger quantities consumed (Huckle et al. 2008). Of further concern, increased outlet density leads to increased competition and lower prices for alcohol (Livingston, Chikritzhs & Room 2007), with a potential increase in risk. Further investigation of these connections is warranted.

Greater certainty is evident in the links between outlet density and violent assaults. An association is established between violence and outlet density, with availability and access to alcohol of fundamental importance to prevention initiatives (Zhu, Gorman & Horel 2004). Outlet bunching contributes to 'binge' drinking, alcohol related injuries and violence (Livingston, Chikritzhs & Room 2007). The geospatial composition of alcohol outlets also influences the potential for violence in some sociodemographic groups (Gruenewald et al. 2006). Subpopulations of drinkers can be more susceptible to changes in availability; the extent of access to alcohol can adversely influence the consumption level of those most vulnerable (Livingston, Chikritzhs & Room 2007).

Density and type of outlet contribute to the prevalence of a number of health conditions. Relationships are borne out between the density and prevalence of 'on premise' and 'off premise' outlets, the number of hours per week alcohol is sold, and liver cirrhosis mortality (Moskowitz 1989), a condition mostly evident in those dependent on alcohol. Physical, social and staffing factors within drinking venues also precipitate or moderate risk (Hughes et al. 2011). Nonetheless, flaws are identified by Livingston and colleagues (2007) in outlet density research due to the practice of treating every outlet as an equivalent value. Significant differences between venues are important and have, to date, not been adequately considered in research modelling. In the light of these findings (Livingston, Chikritzhs & Room 2007), outlet density, as a measure of situational availability, needs further investigation. Variation in effect between the different types of

alcohol outlets and the prevalence of intoxication, violence, and assault needs to be established. The influence of the type of venue on the most vulnerable of drinkers requires clarification. An associated factor - hours and days of sale - is subject to discussion in the following section.

Hours and Days of Sale

In addition to the density of liquor outlets, hours and days of sale are important measures of situational availability, corresponding with risk. Research suggests that the hours during which alcohol is sold influences the timing of consumption (Moskowitz 1989), predisposing to risk. But, as Moskowitz (1989) determines in a review of the literature, changes in hours of sale do not necessarily alter the overall level of consumption. When changes are made to access through altered days of sale, the prevalence of alcohol problems in a population is expected to correspondingly change (Stockwell & Gruenewald 2001). As determined by Stockwell and Gruenewald (2001), small changes in hours of sale can impact at significant levels in local environments. The introduction of more flexible hotel trading hours in Tasmania was followed by an increase in the number of causality traffic accidents (Smith 1988).

There are other Australian examples. Changes in Sunday trading hours in Perth adversely impacted on overall traffic safety; a 10pm rather than 6pm closing time caused a shift in the distribution of accidents, but did not increase the occurrence of traffic crashes (Smith 1983). Later trading hours for hotels in Perth resulted in a greater number of patrons, more intoxication, and consequently, increased violence (Chikritzhs & Stockwell 2002). In Newcastle, restrictions on hotel closing times to between three and three-thirty a.m. achieved a reduction in the incidence of night time assault by almost forty percent (Kipri et al. 2010).

Similar results are reported in other countries. American research suggests that increases or decreases by two or more hours in daily alcohol sales result in a corresponding increase or decrease in alcohol associated harms (Hahn et al. 2010). From these findings it is difficult to determine whether changes of less than two hours have a significant effect; this discrimination is important to alcohol public policy and intervention. Greater certainty surrounds the interrelationships between the legal drinking age and risk and harms from alcohol, as revealed by the following discussion.

Legal Drinking Age, Underage Supply and Harms

Adding to the risk and harms attributable to alcohol availability, legal drinking age and underage supply also have an influence. A number of arguments are used ‘for’ and ‘against’ a legal drinking age of twenty-one years. The social argument in favour of a lowered drinking age is that confirmation of adulthood at eighteen years of age brings a wide number of privileges and responsibilities, so why not legal access to alcohol (Toomey, Nelson & Lenk 2009). As a counter argument, modification of the legal drinking age results in a corresponding variation in intoxication related problems such as traffic fatalities, juvenile crime, serious assault, and drunkenness convictions for the age group most affected by the change (Stockwell & Gruenewald 2001). These consequences, accidents and fatal crashes, are negatively correlated with drinking age in general. When the legal drinking age is raised, harms decline in the age group of drivers most affected by the change (Moskowitz 1989; Smith 1983).

The period of youth and adolescence is one of high risk. An increase in legal drinking age corresponds with reduced levels of harm in teenagers and young adults (Stockwell & Gruenewald 2001). Risk is compounded for this group by an absence of enforced restrictions on underage drinking in public. As confirmed by an investigation in Oregon,

communities with higher minor possession laws have lower rates of alcohol use and ‘binge’ drinking (Dent, Grube & Biglan 2005). Limitations are evident in the effectiveness of age restrictions on public purchase, with young people able to access alcohol through other means (Forster et al. 1995; Komro et al. 2007). But some variation is apparent between research findings. Results of a Canadian investigation suggest changes in alcohol availability are unrelated to alcohol consumption, at least with regards to legal purchase age and beer sales (Parker & Harman 1978).

Home access to alcohol is of parallel concern. It is often assumed that drinking at home will teach young people how to drink safely. Permission to drink at home does not preclude heavy drinking episodes (Livingston et al. 2010) and will not prevent alcohol associated risk. As experimental consumers, the effects of alcohol are novel to young people; there is limited prior experience in managing these effects. The prediction of increasing demand for availability on the part of new consumers (Smart 1977) has relevance to underage supply and experimentation by the young. Coupled with the density of outlets and hours and days of sale, these circumstances present a challenge, or, alternatively, an opportunity for a bold new approach to alcohol policy. Nonetheless, a proscribed legal drinking age does not limit use for young people; both general and situational availability facilitate alcohol demand.

Tasmania Police passed legislation that prohibits the provision of alcohol on private property to those under eighteen years without the consent and supervision of a parent or responsible adult (Tasmania Police 2011). A great opportunity was lost according to the Tasmanian Health and Human Services Department. The legislation could have been extended to prohibit alcohol supply to all young people less than eighteen years of age, irrespective of drinking location or parental consent. Findings support this position in that

perceived availability for underage drinkers is significantly related to obtaining alcohol from a number of sources: persons twenty-one years and over and less than twenty-one years, commercial outlets (Wagenaar et al. 1996), and parental supply (Komro et al. 2007).

Overall, the physical availability of alcohol emerges as a prominent policy issue, worthy of serious consideration at both population and community levels. Benefits are possible in the short term from public policy that aims to reduce access to alcohol through all available means. A minimum floor price for alcohol could add to the gains from limiting physical access, but is a complex policy measure to formulate. Work on price structuring is a worthy medium to long term goal for alcohol policy (Christie 2011). But, a reduction in the overall availability of alcohol needs to be matched with policy approaches focusing on consumers' drinking behaviour. The concept of actual availability is not sufficient on its own to understand alcohol consumption (Rabow et al. 1982). Further clarification of the role of perceived availability in purchase, consumption and harms from alcohol is necessary. How drinkers negotiate the risks of ready access and the factors impacting on drinking decisions are likewise vital. These areas represent some of the answers to the policy problems of alcohol and help inform a public alcohol policy model. The behavioural attributes of consumption are important to the review of the literature, an investigation commenced in the following section.

3.5 Potential Policy Solutions: The Behavioural Attributes of Alcohol Consumption

While contextual factors such as general availability, situational availability and price have a strong influence on risk and harms from alcohol, other factors are important to public alcohol policy. The next section of the literature review will examine the psychological aspects of drinkers' response to alcohol, as well as the behavioural attributes that

predispose to risk. Behavioural dimensions include: taking risks, coping and maintaining control; motivations for drinking; alcohol expectancies; and perceptions related to risk and consumption. These areas are discussed, beginning with associations between personal control factors and coping with alcohol.

3.5.1 Control: Relationships with Coping

Control, as a behavioural attribute linked to drinking motivations, alcohol expectancies, and perceptions is investigated. Taking into account the variability evident in alcohol risk and harms, the personal capacity to cope with and control alcohol likewise varies. A response to a stimulus like alcohol is unpredictable, and depends not only on its inherent properties but also on an individual's cognitive appraisal of the 'controllability' of the stimulus (Volpicelli 1987). Different meanings are implied for 'control' according to the construct of drinking behaviours, attributes of the drinker, and the overall context of consumption (Bogren 2006). Volpicelli (1987) states, "the psychological dimension of 'controllability' importantly determines the emotional, behavioural and physiological state of an organism in responding to environmental events" (p. 384). Bogren (2006) proposes that alcohol users can be 'in control', and, if loss of control occurs, strategies are developed to overcome the situation.

Coping and control are closely aligned concepts. One way of explaining control, with relevance to the concept of 'risk' as well as 'loss of control', is to regulate one's self or one's emotions. Other explanations draw on research findings to explain and define 'self-control'. Self-control is "a set of related abilities that involves focusing and shifting attention, monitoring behaviours, linking behaviours and consequences over time, and considering alternatives before acting" (Wills et al. 2006, p. 265). Wills and colleagues

(2006) differentiate between 'behavioural self-control' and 'emotional self-control' and demonstrate these as statistically distinct variables correlating with substance use.

Following specific events perceived as 'uncontrollable', some individuals are at risk of increased drinking and alcohol abuse (Volpicelli 1987). The capacity to cope with uncontrollable and calamitous events is explained as "behaviour that protects people from being psychologically harmed by problematic social experience; behaviour that importantly mediates the impact that societies have on their members" (Pearlin & Schooler 1978, p. 2). Pearlin and Schooler (1978) suggest behavioural responses are actioned by perceptually controlling the meaning of experience, modifying harmful effects and limiting emotional outcomes; accordingly, the protective function of coping is exercised. These authors concur coping modes have an unequal distribution across society. Differences are likely reflected in population level data of alcohol consumption and associated harms.

Self-control, as a behavioural resource, has limits; depletion can be an outcome of exertion of control (Muraven & Baumeister 2000). In one investigation, self-control strength is not 'consumed' in behaviours where self-control is not activated (Muraven & Baumeister 2000). In a related inquiry, the regulatory depletion patterns of self-control of university students are investigated (Muraven, Tice & Baumeister 1998). In this American research, examination of concurrent studies reveals limits to self-regulation, with temporary depletion observed similar to what occurs in the exertion of physical strength. Building on earlier research, self-control is tested through a number of laboratory conditions with fifty-eight male volunteers recruited through newspaper advertisements (Muraven, Collins & Nienhaus 2002). A preliminary conclusion of the Muraven, Collins and Nienhaus (2002) study is that "alcohol intake may be a function of temptation to drink and self-control

strength” and “any factor that influences self-control can affect the ability to regulate alcohol in situations that call for restraint” (pp. 113, 118).

This evidence is consistent with findings of later research involving 160 social drinkers in New York (Muraven & Shmueli 2006). The study reports that resisting the urge to drink depletes self-control strength and undermines self-control performance. Mood and arousal have little effect on how much a person has to fight against the temptation to drink. Findings also reveal that individuals with low self-control cannot regulate alcohol intake very well, and excess drinking and violation of personally imposed limits are likely outcomes. Results complement earlier research. Short term exertion of self-control leads to a decrease in self-control strength (Muraven, Baumeister & Tice 1999). But benefits occur over the longer term, with a strengthening of the characteristic possible through continued practice (Muraven, Baumeister & Tice 1999). Moreover, self-control carries with it a range of meanings and behavioural outcomes based on a number of important distinctions (Bogren 2006).

In the words of Bogren (2006), a “teetotaler argument implies control over one’s self to avoid all drinking; in the age distinction argument control implies no drinking at all for the very young and moderate drinking for adults”. “In a moderate drinking argument, control is still important and there is no indication of controlled loss of control; in the getting drunk argument, control implies, for example, not vomiting when drunk, which may be seen as implying a controlled loss of control” (pp. 529, 530).

These variations are further explained. Findings from an American investigation of male alcoholics in outpatient treatment demonstrate ‘loss of control’ and ‘inability to abstain’

are separate constructs (Kahler, Epstein & McCrady 1995). In this study, difficulty in controlling consumption is most evident for those subjects who drank to high levels. Findings indicate a negative correlation between alcohol consumption and control; when consumption increases, self-control decreases. Loss of control is not associated with the frequency of consumption in this research. Kahler and colleagues (1995) concede that inadequate research measures could account for some results. Nevertheless, inability to abstain is contended in this thesis to be closely related to loss of control. These concepts can be represented on a continuum that seeks to categorise the discretionary aspects drinking - from completely nonvolitional to entirely volitional behaviour (Wall, Hinson & McKee 1998).

Behavioural responses are not always what they seem. Behaviours that appear 'out of control' to an observer can represent a response to the immediate surroundings and the perception of possible options in a particular situation (Gifford & Humphreys 2007). These authors contextualise addictive alcohol behaviours as occurring in a social milieu, either risk or protective in effect. It is possible for the social context of drinking to mask behaviours and potential risks. Intoxication, as an 'out of control' response to alcohol, is not immediately recognisable, representing a challenge to prevention as well as to public health policy (Brick & Erickson 2009). If intoxication occurs in a celebratory context, such as at a party with lots of jollity, the incident is not always acknowledged and rarely challenged. In these contexts, loss of control is not generally distinguishable from celebratory behaviour; these circumstances go hand in hand in some cultures (Room & Makela 2000). The next section of the literature review will investigate relationships between behavioural control and the motivations linked with consumption behaviours.

3.5.2 Control: Relationships with Drinking Motivations

Drinkers throughout the world and in Australia consume alcohol for a multitude of reasons and anticipated effects (Beck, Summons & Thombs 1991; Nagoshi 1999; Volpicelli 1987; Wills et al. 2006). In analysis of motivations and drinking control of 142 students at Arizona State University, Nagoshi (1999) concurs that the *level of alcohol use* is associated with drives like celebration and social activity, but also with sensation seeking and a desire for loss of control; *problems with alcohol use* are associated with more negative motivations, such as anxiety. It is evident that adolescent alcohol use is primarily driven by a desire for positive effects from consumption (Beck, Summons & Thombs 1991), somewhat in agreement with Nagoshi (1999). But, while motivation is intrinsically an internal psychological concept, the relationship with actual risk becomes more evident throughout the course of consumption. Loss of control once substance use has begun is a significant risk factor for harms (Nagoshi 1999).

Other studies confirm additional motives for consumption. Kuntsche and others (2006) review past empirical research of drinking motives in young people aged between ten and twenty-five years. In the 82 studies analysed, little variation in motivation is evident between the genders in late childhood and early adolescence. Later into adulthood, gender specific drinking motives are evident. With regard to personality factors, alcohol use by adolescent boys is largely driven by social motivation. For boys, “extraversion and sensation seeking behaviours correlate with enhancement motives” while “neuroticism and anxiety correlate most strongly with drinking motives for coping”, especially for girls (Kuntsche et al. 2006, p. 1844). Some cultural similarities in drinking motivations are observed in the study, with social enjoyment reasons found to be prevalent across countries. Unlike other research referred to by Kuntsche and colleagues (2006), their

findings show impulsive behaviour does not significantly predict drinking motives when extraversion and neuroticism are taken into account.

Recent and annoying problems occurring ‘day to day’ are an alcohol associated risk, as shown in an investigation of more than a thousand school students in New York (Wills et al. 2006). These authors draw on the work of others to suggest substance use can occur as a way of dealing with stressful circumstances and significant life events. Results reveal that good behavioural self-control and good emotional self-control are both inversely related to substance use, of importance to future prevention initiatives. Findings of Wills and colleagues (2006) are consistent with those of Volpicelli (1987) confirming the tension reducing effects sought through alcohol use. Following events viewed as uncontrollable, drinkers may consume alcohol to reduce the effects of a deficiency in endorphin activity (Volpicelli 1987).

The importance of the psychological dimension of controllability in response to the environment is also emphasised by Volpicelli (1987). In support of this position, impaired control, as an eroding of intention, is of fundamental significance to consumption “without qualification with alcohol dependence” (Heather 1995, p. 1047). Heather (1995) further states “impaired control appears early in the history of alcohol dependence and problems, rather than late” (p. 1047). Control and loss of control are associated with a number of drinking motivations. Competency as a drinker is linked with being able to hold alcohol, and being able to stop drinking when limits are reached (Bogren 2006). As an additional factor, drinkers can be motivated to drink by their desire to lose control. “Drinking to extreme intoxication with radical changes from sober behaviour will often be a goal for the drinker, rather than an accidental misjudgement”, a planned loss of control (Room & Makela 2000, p. 481). While a determination to lose control is an important motivating

factor for some drinkers, other anticipated effects drive consumption behaviours, such as alcohol expectancies.

3.5.3 Control: Relationships with Alcohol Expectancies

Alcohol expectancies, as the experiences anticipated from consumption, are closely aligned with motivations for drinking and other behavioural control factors. Abstinence is predicted by anticipation of negative effects; the level of consumption is explained by positive expectancy (Leigh & Stacy 2004). For college students, the frequency of intoxication relates to the expectation of sexual enhancement from alcohol; global positive expectancies predict maximum daily quantity (Carey 1995). In addition, significant variation is evident between attitudes and expectancies, with the latter a more proximate indicator of excessive consumption (Wall, Hinson & McKee 1998). How links are formed between expectancies and loss of control is explained; the anticipation of excess consumption and the expectancies accompanying heavy drinking help precipitate loss of control. Nonetheless, expectancies do require some form of cultural endorsement in order to operate as drinking motivations (Leigh 1990).

Alcohol expectancies predict use, change in use, and misuse across the two decades into middle adulthood (Patrick et al. 2010). Alcohol related cues create psychological and physiological responses, consistent with classical conditioning (Laberg 1986). Laberg (1986) maintains there is more to the link between expectancies and craving than the physiological effects of alcohol; the severely dependent drinker is influenced to a greater extent by alcohol cues than those less dependent. Consistent with Laberg (1986) on the psychological responses to alcohol in the form of expectancies, Leigh states the “perceived desirability of the effects of alcohol is an important factor in understanding the relationship of expectancies to drinking” (Leigh 1987, p. 135). This author concludes the negative

effects of drinking, disinhibition and loss of self-control, are more influential in the choices of heavy drinkers than anticipation of the positive effects of consumption. Leigh (1987) also states the positive experiences associated with drinking are more often reported by heavier consumers, with a minimising of harmful effects notoriously undertaken by this group. What is certain in the review of the literature is that behavioural control plays a sizeable role in the development of motivations, coping, expectancies and alcohol associated risk. These connections are important to understanding the behavioural attributes that lead to consumption, and in particular, the perceptions that contribute to risk. This mostly unexplored area for alcohol policy is now investigated.

3.5.4 Perceptions: Relationships with Risk and Consumption

Control, coping, motivations and expectancies are all subjective constructs of personal behaviour. 'Perceptions' are another. Psychological aspects of drinking, such as perceptions, influence alcohol related risk. Despite the wealth of information related to drinkers' perceptions, a way of including this rich knowledge in alcohol policy for Australia is yet to be developed. Both positive and negative relationships are evident between the extent of perceived risk in a particular situation and associated risk taking behaviours (Reyna & Farley 2006). Individuals appear to be either predominantly risk takers or risk averse. Reyna and Farley (2006) discuss risk taking and risk aversion as rational responses to specific situations, particularly if decision making processes in relation to the presenting environment are sound. These authors observe that risk taking, particularly in adolescence, occurs in intentional and unintentional ways, with diversity in behaviour requiring different policy responses. They propose conscious risk taking, especially for higher levels of risk, decreases as age increases from adolescence into adulthood. Taking these circumstances into account, policy needs to account for a potential variation in risk between different drinking cohorts.

Contrary to expectations, adolescents often overestimate risk and “do not perceive themselves to be invulnerable” (Reyna & Farley 2006, p. 2). Reyna and Farley’s (2006) research supports the position that children and adolescents are less able to delay gratification through inhibiting risky behaviours when compared with adults. In this study, behavioural control factors exert an influence. An “overall tendency to view one’s self as more invulnerable to risk than unspecified others” is relevant to understanding decisions and behaviours (Reyna & Farley 2006, p. 25). These findings are especially germane to alcohol consumption. In a study of American children aged nine to thirteen years, those children with low perceived risk for self, coupled with high perceived risk for other children, have the highest percentage of childhood alcohol use at one year follow up (Reyes et al. 2010). Of related importance, perceptions of how much peers drink and their attitudes to alcohol, referred to as ‘social norms’, also show an effect on alcohol related behaviours for young people (Hughes 2008; Hughes et al. 2008).

Risk perceptions are further explained in an Australian *Study of Attitudes and Behaviours of Drinkers at Risk*, with perceptions of health effects clearly demonstrated (National Drug Strategy 2002). Excessive drinking and perceived effects are covered in the research report, as are perceptions of the positive benefits of abstinence. Moreover, in Australia, the National Drug Strategy Household Survey reports on: the perception of drugs most associated with a drug problem; drug use perceived as most concern to the community; the drug most associated with mortality; as well as perceptions of the health effects of alcohol (Australian Institute of Health and Welfare 2008, 2011). Similarly, the current National Alcohol Strategy mentions the public perceptions of alcohol consumption, drawn from National Household Survey data (National Drug Strategy 2006). But, this acknowledgement has not led to a focus on perceptions in public alcohol policy or strategic intervention.

Alcohol related perceptions are an overlooked opportunity for alcohol policy; perceptions are not a focus of strategic alcohol approaches. Nonetheless, an analysis of subjective concepts, such as perceptions, could provide additional knowledge of relevance to alcohol availability, drinking decisions and the risk and harms that ensue. Investigation of perceptions could help clarify the subjective relationships between coping, motivations, expectancies and control. But risk from alcohol availability and use in the community extends not only to drinkers who generate behavioural perceptions and cognitive decisions about alcohol, but also to nondrinkers who experience injury and social harms as a result of the drinking of others (Room, Laslett, et al. 2009). Influencing through policy, the risk perceptions of those who consume alcohol, could benefit the innocents caught in the crossfire between the excesses of availability on the one hand, and the risk taking behaviours of drinkers on the other. It is clear that the problems surrounding vulnerable drinkers, as well as nondrinkers, persist in relation to policy framing and intervention. The links between vulnerable drinkers, as at risk population groups, and loss of control will next be investigated as part of the solution for alcohol policy in Australia.

3.5.5 At Risk Population Groups and Loss of Control

The drinking of at risk subpopulations contributes to health and social harms in Australia. Livingston and colleagues (2007) determine the long term health problems of vulnerable groups are adversely influenced by variation in availability, a situation compounding an already compromised health status. Reversing the risk status for these population groups is an important role of alcohol policy. International research confirms loss of control as a significant behavioural issue for many categories of drinkers. Evidence reveals loss of control is a contributing factor to alcohol dependence (Caetano 2002; Heather 1995; Jellinek 1952; Julien 1995; Ludman, Yucel & Pantelis 2004; West 2006; World Health Organization 1992). Other categories of drinkers at risk of losing control are determined

as: heavy drinkers (Room & Leigh 1992); ‘binge’ drinkers (Engineer et al. 2003; Marczinski, Combs & Fillmore 2007); those with concurrent mental health and alcohol related problems (Lejoyeux et al. 1999; Sonne et al. 2003); children of alcoholics (Chassin & Barrera 1993; Murray, Clifford & Gurling 1983; Schuckit 1987); social drinkers with other control related issues (Muraven, Collins & Nienhaus 2002; Muraven et al. 2005); pregnant women unable to stop drinking (Smith et al. 1987); and young people in general (Martin et al. 2000; Wills, Ainette & Mendoza 2007; Wills et al. 2006). Those who drink to intoxication represent a group at risk of disinhibition and behavioural loss of control (Marczinski, Combs & Fillmore 2007).

Despite international evidence confirming the importance of behavioural control, there is a dearth of research of alcohol use and loss of control for subpopulations at risk in Australia. The most detailed investigations relate to Indigenous Australians (d'Abbs 2001; Hall, Hunter & Spargo 1993; Hunter, Hall & Spargo 1992), confirming associations between loss of control and alcohol harms. Even so, the lack of recent Australian research into the loss of control of vulnerable groups is likely due to a policy focus on harm reduction, rather than on those nonvolitional behaviours that contribute to alcohol risk. Despite these gaps in the Australian literature, there is convergence between the categories of drinkers with loss of control issues identified in the international studies described above and those population groups determined to be most at risk in Australian Government publications (Australian Institute of Health and Welfare 2005b; National Drug Strategy 2001b; National Health and Medical Research Council 2009). This is certainly an area warranting further investigation to determine the full extent of drinker loss of control in Australia. These issues are revisited later in the thesis.

3.6 Literature Review Summary

According to the review of the literature, there are a number of problems associated with alcohol and with alcohol policy, as well as potential solutions to these concerns. Risk and harm associations are clearly demonstrated with regard to the intrinsic properties of alcohol and the levels and patterns of use, both globally and in Australia. Other important issues relate to the development of policy more generally and the specific difficulties of forming alcohol policy within a harm reduction philosophy and sociocultural frame. Epidemiological research and findings of behavioural investigations have potential to provide answers for challenging alcohol policy problems.

Solutions are possible with reference to the environmental context of use, primarily availability in all its significant forms: population availability, situational availability, economic availability, and perceived availability. Another part of the solution includes the behavioural attributes of consumption: control, motivations, expectancies and perceptions. According to the literature, the personal ability to cope with alcohol is dependent on the extent of alcohol available in the drinking environment as well as a drinker's behavioural response in situations of varying levels of access. If public alcohol policy is to address these concerns, alcohol availability and consumption behaviours require a substantial focus.

Perceptions represent a potential policy solution. As evidenced in the literature, drinkers display different ways of coping with alcohol in various social situations and drinking circumstances. Drinking motivations and alcohol expectancies add to the risk through associations with perceptions and other control factors. The concept of control is of fundamental relevance to drinking decisions and drinking behaviours, of significant import to public alcohol policy. The ability to cope with and maintain control over behaviours

associated with alcohol determines, to a large extent, the capacity to avoid risk as well as minimise harm. Loss of control is a significant issue with subpopulations at risk from alcohol; depletion of control contributes to the risks experienced in particular drinking circumstances.

Population indicators, alongside behavioural indicators, are again emphasised as significant contributors to risk. An alcohol policy framework that combines these factors could assist in policy advancement and support development of a public alcohol policy model. As shown throughout the review of the literature, there is good evidence to inform public alcohol policy direction. But this evidence is not organised nor applied in logical ways to aid policy framing or strategy development. Current levels of alcohol availability and current ‘styles’ of drinking behaviour are not consistently addressed in current policy approaches; these problems require immediate confrontation by government officials, public health experts and concerned communities. Turning around these problems will not be an easy task. Even so, this thesis adds to the knowledge of alcohol problems and presents potential solutions to the challenge of public alcohol policy.

3.7 Gaps in Current Research

A number of omissions are identified relevant to the thesis inquiry. The importance of availability and consumption, as indicators of alcohol associated risk, is a recurring theme throughout the literature. But, documented use of population theories to inform policy direction for alcohol availability and consumption in Australia is lacking. Nonetheless, the environmental context of alcohol use has the potential to inform public alcohol policy. There is a lack of research of behavioural theory for public alcohol policy. No substantial review of behavioural theories in relation to alcohol use is identified. The attributes of consumption behaviours have potential to inform the path of policy success. Behavioural

control, associated in the literature with coping, motivations for drinking, alcohol expectancies and perceptions, is generally ignored in alcohol policy discourse. The place of drinkers' perceptions is not usually considered when policy direction is developed. These gaps are apparent in the literature, despite the significance of the use environment and behavioural responses to alcohol availability in the development of risk and harms.

No synthesis of theory to inform the course of public alcohol policy in Australia is evident. Problems are apparent in current national alcohol policy (National Drug Strategy 2006); other intended policy reforms are yet to be well progressed (Daube 2010). There is no evidence of the structured use of theory to redirect public alcohol policy in this country. An overview of research in the form of theory is usually overlooked in this regard. This is despite valid theory providing an explanation of observed phenomena, a reliable predictor of associated outcomes (West 2006). While copious epidemiological evidence and other science based research is available, this is not systematically applied in the frame and structure of public alcohol policy, or to a public alcohol policy model.

A theoretical perspective on the course of alcohol policy is decidedly absent. Theory is not utilised in the literature as knowledge for a public alcohol policy model. No comprehensive alcohol policy model has yet been developed for Australia, one that can inform and energise national alcohol policy by addressing environmental factors alongside consumption behaviours. There is no way of knowing whether an excessive, or alternatively, more moderate response to alcohol is supportable; this inquiry is not well covered in the literature to date. A way of overcoming these omissions needs to be identified. The challenge then, central to the aims of this thesis, is to establish the evidence in support of theory and determine how theory can contribute to a public alcohol policy model, thereby answering some of the questions that remain.

The gaps identified in the literature help define an investigation of theory for alcohol policy and inform the direction of this thesis. Theory is searched to clarify the environmental context of alcohol use and the attributes of consumption behaviours. Analysis of theory is directed towards the availability and consumption of alcohol and the inevitable harms from demand and use. Theory is analysed to explore the synergy between population strategies on the one hand and behavioural interventions on the other. Reference to theory is undertaken to advance knowledge of supply, demand and harms from alcohol and provide comprehensive evidence for strategic direction. Theory is investigated to organise and strengthen the evidence base for public alcohol policy and to contribute to a public alcohol policy model. The next chapter commences this process through identification of the population and behavioural theories with potential to inform public alcohol policy.

Chapter 4: Establishing the Potential of Theory for Alcohol Policy

4.1 Introduction: Theory as Reference for Policy

Theory is reflective of robust explanatory power to describe and explain significant relationships. The evidence for policy that theory can provide is acknowledged in the health and social science literature. Valid theory is a credible evidence base for the new public health paradigm (Baum 2002). Explanatory models, such as theory, provide a way of controlling for environmental variation (Smelser 1976). Even so, theory is a symbolic way of representing the ideal world instead of putting together already known ways of viewing an issue, providing unexpected perceptions (Galtung 1990).

But theory has limits to its application. While theory is a conceptual framework for key constructs, it is not a panacea in all situations (DiClemente, Crosby & Kegler 2002). With reference to theory, full control over all variations and environmental conditions is not possible (Smelser 1976). Current theories are unable to fully predict a range of behaviours or behavioural change mechanisms (Baranoswki et al. 1997). Consistent with this position, theory is necessary in policy making, but not without practical issues regarding its utility, especially with models of health care (Lin & Gibson 2003). The concerns raised by Lin and Gibson (2003) regarding theory in health care modelling underestimate the explanatory and predictive power of theory and fail to recognise that theory has much to offer in the development of public policy.

To add foundation to environmental strategies and behavioural interventions, this thesis argues that public alcohol policy can be built on theoretical concepts. As a moderate position, Room (2007) suggests policies are more generally formed on fragments of theories, not on full blown theoretical statements; theoretical models do not dictate one

policy direction but a range of choices. Policy requires more of the art of policy making to merge with the science to ensure “scientific findings don’t fall on blank minds that get made up as a result” (Pang 2007, p. 247). Nonetheless, the indirect influence of theory on policy already occurs through the academic backgrounds and organisational experiences of governments and policy makers. These influences mainly occur in unstructured ways that hinder cogent policy responses to complex social issues.

In the making of alcohol policy, where key values and ideas need clarification, the place of theory is distinctively relevant. Theory can assist in selecting the factors that more often influence health related behaviour (DiClemente, Crosby & Kegler 2002). The development of constructs, including valid theory, occurs primarily in relation to a core category of concepts, or perhaps several categories (Strauss 1987). The application of theory, in addition to a reliance on data, is the logical next step to take public alcohol policy to a more informed position. Theory provides an additional layer of evidence for policy and assists in the organisation of research findings. Theories selected to inform alcohol policy need to clarify the alcohol use environment, predict the choices of drinking behaviour, and explain the inevitable consequences of use. Population level theories with relevance to the environmental context of alcohol use are acknowledged; behavioural theories representing the attributes of consumption are identified.

If theory is used for the direction of alcohol policy, it needs to be consistent with well acknowledged frames of reference, such as harm minimisation. *Harm minimisation* is a comprehensive policy frame for substance use and substance policy (Lenton & Single 1998). Within a harm minimisation context, *supply* encompasses availability in all its forms, including general, situational and economic perspectives. *Demand* includes drinkers’ responses to alcohol and the thought processes and behaviours that drive

consumption. *Harms* occur as a result of relationships between alcohol availability and consumption behaviours. In these contexts, the links between population level alcohol policy, interventions for subpopulations and relevant theory are plausible; exploration of theory for public alcohol policy is a worthwhile undertaking.

4.2 Stage One: Population Level Theory and the Environmental Context of Alcohol Use

Stage One determines the theory that most informs the environmental context of alcohol use at the population level. The following data bases were searched for all years to identify research most applicable to this stage of the inquiry: AUSThealth, AUSTROM, CINHAL, MEDLINE, PubMed and SocINDEX. Search terms used are: ‘alcohol’, ‘alcohol related problems’, ‘availability’, ‘consumption’, ‘demand’, ‘environment’, ‘framework’, ‘harmful consequences’, ‘harms’, ‘health’, ‘model’, ‘population’, ‘structure’, ‘supply’, and ‘theory’. In all, nine significant population theories are identified.

4.2.1 Discussion of Population Theories of Interest

For theory to be relevant to public alcohol policy it must go some way in explaining relationships between alcohol availability, consumption behaviours and the consequences of use, important indicators of alcohol problems. The most applicable theory to population alcohol policy needs to encompass the harm minimisation components of *supply*, *demand* and *harms*. Three theories are identified that address at least two of these indicators. These theories are *Availability Theory* (AT), describing relationships between availability, consumption and harms at the population level (Bruun et al. 1975); *Supply and Demand Theory* (SDT), as fundamental principles of economic theory and practice (Klein 1988); and the *Rational Addiction Model* (RAM), an economic theory of demand for a good that is addictive (Becker & Murphy 1988).

Six theories are not subject to further scrutiny. The rationale for exclusion lies in these theories addressing no more than one of the *supply*, *demand* and *harm* components. One of these theories is *General Diffusion Theory* (GDT), whereby “the diffusion of a behaviour takes place in an abstract medium of social networks as well as geographical proximity” (Ferrence 2001; West 2006, p. 110). While West (2006) defines diffusion theory as a comprehensive population theory, it is considered in the current context as one primarily explaining interactions within immediate social networks. The theory does not refer to supply or demand, or give due focus to harms. Nonetheless, GDT can help explain how patterns of consumption develop within groups and how one group of drinkers influences other groups (Skog 1985).

Four socio-ecological models of health are identified, whereby several different fields of research are bridged as relationships between individuals and their environments (Stokols 1996). The comprehensive *Biopsychosocial Model* has some face validity in explaining environmental influences on health harms. However, the theory is primarily a philosophy of clinical care and a practical clinical guide (Borrell-Carrio, Suchman & Epstein 2004; Engel 1977), not applicable in a population context. Other ecological theories - the *Person Environment Fit*, describing worker wellbeing in relationship to the work environment; and the *Ecology of Human Development Theory* (Stokols 1996), acknowledging the progression from childhood to adulthood within changing immediate environments - do not account for the *availability/supply* of a good within the use environment or the *intake/consumption* of a good as *demand*. These theories are not a focus of analysis. They do assist, however, in clarifying some of the key environmental influences on health related harms.

An associated model, *Sociocultural Theory* (Stokols 1996) first systematised by Vygotsky, “is based on the concept that human activities take place in cultural contexts, and are mediated by language and other symbol systems” (John-Steiner & Holbrook 1996, p. 191; Vygotsky 1986). Relationships between supply, demand and harms are not a premise of the theory, so it is unsuitable as a public alcohol policy basis. The Public/Population Health Model (PHM) is also acknowledged, but, as explained by Babor and colleagues (2010, p. 7), is “concerned with the management and prevention of diseases and injuries in human populations”, and is not specific to alcohol. Availability Theory (AT) as a population level model describes the effects of alcohol control policies on total populations (Bruun et al. 1975). AT is specific to alcohol and better covers supply, demand and harms than the PHM. For these reasons AT, but not the PHM, is subject to analysis.

4.2.2 Primary Population Theories of Focus

Three theories that cover at least two of the components of *supply*, *demand*, and *harms* are described. First, AT (Bruun et al. 1975) outlines the concept of population level alcohol availability. As a general model, the theory explains relationships between availability, consumption and harms. AT refers to a set of hypotheses that argue for controls over the public availability of alcohol to influence the extent of alcohol related problems and harms (Single 1988; Stockwell & Gruenewald 2001). Connected hypotheses are as follows: alcohol availability is positively related to the mean level of consumption; mean consumption is correlated with heavy drinking; and heavy drinking is associated with adverse health and social effects. According to AT: ‘heavy use’ is categorised as a dependent variable; ‘alcohol consumption’ is determined as an independent variable.

The complex links between independent and dependent variables are not fully explained by AT. As well, the precise relationships proposed by the theory between heavy users and

mean population consumption are contestable (Duffy 1986; Miller & Agnew 1974). Nonetheless, the authors of AT propose “the proportion of heavy users appears to be approximately proportional to the square of the mean consumption”, such that “we would expect a population with a mean consumption per consumer of 10 litres of pure alcohol per year to contain 3% of heavy consumers”; when total consumption increases, so does the prevalence of heavy users (Bruun et al. 1975, pp. 35,36). Despite these claims, the foundations of AT are broader than the name implies. The theory encompasses not only supply as availability, but also demand as consumption, and alcohol associated harms. Analysis of AT could assist in determining how best to limit access to alcohol, contain use and reduce harms. Analysis of AT could provide knowledge for public alcohol policy and a public alcohol policy model.

The second theory considered, *Supply and Demand Theory* (SDT), is essential to an economic perspective. The principle of ‘supply and demand’ underpins conceptualisation of the theory; this notion is prominent in the writings of economists and in the forming of economic policy. Economic researchers (Thweatt 1983) refer to the term ‘supply and demand’ as originating from the text of James Steuart (1767) “*Inquiry Into the Principles of Political Economy*”. ‘Supply and demand’ as a theory is originally referred to in the 1890’s edition of “*Principles of Economics*” (Marshall 2009). Hence, the concept of supply and demand has been an active consideration in economic matters for some time. SDT essentially covers how price is determined in the marketplace (Klein 1988). The concept of elasticity, how supply and demand respond to factors like price, is fundamental to the theory.

Availability of a good, as supply, is reliant on demand from potential consumers; as the price rises, a corresponding fall occurs in the quantity of the product required (Godfrey

1989). According to Godfrey (1989), “economic theories of consumer behaviour start from the premise that consumers have to make choices because consuming one good, say a bottle of wine, involves foregoing the consumption of other goods” (p. 1124). In addition, ‘supply and demand’ is used to inform economic concerns like changes in wage structure (Katz & Murphy 1992) and provides some certainty of forecast in volatile business markets (Fisher et al. 1994). Supply and demand is referred to in economic analysis related to alcohol, including by Godfrey (1989). Examination of SDT (Klein 1988), within an alcohol policy context, helps disentangle the impact of alcohol in the marketplace and the level of demand of consumers.

The third theory discussed, the *Rational Addiction Model* (RAM), involves the conceptualisation of a consistent plan on the part of addictive consumers to rationalise utility over time (Becker & Murphy 1988). Utility refers to how well a product meets the requirements of a purchaser. A basic concept of economic models of addictive behaviour is that “an increase in past consumption of an addictive good raises current consumption because it increases the marginal utility of current consumption of that good” (Grossman, Chaloupka & Anderson 1998, p. 631). A goal to maximise health, as an alternate to maximising utility, leads to different decisions about a product (Godfrey 1989). The RAM was developed at a time when moderate alcohol consumption was not seen as problematic and alcohol was thought to afford some health related benefits (Grossman, Chaloupka & Anderson 1998). Although not described in the literature as such, the RAM is a subset of SDT; the level of current demand is predicated on an increase in past consumption reliant on supply. ‘Binges’ and abrupt discontinuation of consumption, as features of addiction, are consistent with the RAM (Godfrey 1989). In the context of the RAM, predictions are made regarding the population effects of rises in price on the consumption of addictive

goods (West 2006). According to the RAM, if the price of a product such as alcohol increases, use will generally decrease (Becker & Murphy 1988).

Economic modelling of the RAM is relatively complex (Becker & Murphy 1988); the practical inferences able to be drawn are fairly simple. “The consumption of a certain good is termed to be an addiction if an increase in past consumption of the good leads to an increase in current consumption ... because the consumption of many of these goods harms the consumer and others” (Grossman, Chaloupka & Anderson 1998, p. 631). With reference to the RAM, use of a product decreases through increasing the various costs to the consumer that are associated with a product. While not strictly a comprehensive theory of the environmental aspects of alcohol use, the RAM is included as it acknowledges external factors, such as price, that impact on alcohol consumption. The RAM has wider application than for drinking behaviours. The RAM has relevance at an individual drinker level, but also for populations (West 2006).

4.2.3 Analysis of Included Population Theories

Three population theories - AT, SDT and the RAM - are now described to assess their strengths and limitations in relation to alcohol outcomes and alcohol policy. The theories are detailed with respect to authors and date of publication. The theories combine aspects of ‘supply’, ‘demand’ and ‘harms’ in explaining the environmental context of alcohol use (*Table One*).

Table 1: Population Theory and the Environmental Context of Use

Population Theory	Supply	Demand	Harms
Availability Theory (AT) Bruun et al., 1975; Single, 1988; Stockwell, 2001. A specific alcohol related theory defining relationships between population availability, aggregate consumption and the prevalence of harms	Supply is determined by the population availability of alcohol	Demand is conceptualised as the population consumption of alcohol	Harms are determined as the prevalence of alcohol risk and problems across a population
Rational Addiction Model (RAM) Becker & Murphy, 1988. The theory involves a consistent plan on the part of addictive consumers to rationalise utility over time; an increase in past consumption can result in an increase in current consumption as addiction	Supply is contextualised as price, taxes and legal penalties	Demand can be increased by the rationalisation of the utility of the product Demand can be decreased by price, taxes, legal penalties and health costs, all operate as constraints on use	Health related costs are covered as harms, as is increased current consumption as a result of increased past consumption Primary focus is on addictive behaviours, not alcohol related problems more broadly, such as intoxication and longer term frequent use
Supply and Demand Theory (SDT) Marshall, 1890, 2009; Klein, 1988. An economic model of price fundamental to economic theory	Supply relates to the quantity and price of a product available to be accessed and purchased	Demand is determined by consumer's income relative to the price of a particular product and to product alternatives	Harms to the consumer from the product are not conceptualised in the theory

4.2.4 Choice and Justification of a Population Theory

The *Rational Addiction Model (RAM)*: According to West (2006), addictive behaviours, as conceptualised in the RAM (Becker & Murphy 1988), are made on a rational cost benefit basis from a consumer perspective. But the long run demand for addictive products is more elastic than those not addictive; price changes may have only limited effect on overall consumption (Godfrey 1989). The RAM provides no direct account of the relationships between the amount of alcohol consumed and the level of harms experienced, only to determine if an increase in past consumption leads to an increase in present

consumption, the good consumed is addictive (Grossman, Chaloupka & Anderson 1998). Neither does the RAM provide explanation of consumption resulting in irrational and risky behaviours and out of control responses. The theory fails to account for the various ways alcohol is consumed and the acute health harms immediately following use. The RAM does, however, afford recognition of alcohol as an addictive good, consistent with the view of alcohol as ‘no ordinary commodity’ (Babor et al. 2003; Babor et al. 2010).

The RAM has some validity across the subpopulation of addictive drinkers (Becker & Murphy 1988); it may not be possible to apply the theory to interventions for the remainder of a population not addicted to alcohol. As such, the theory has only limited application to alcohol use behaviours within the context of the supply, demand and harms framework of harm minimisation. The theory does increase understanding of the association between price and use of a product and, in this way, could further inform aspects of availability in relation to consumption. It is not advisable to direct the theory to the prevention of drinking not generally considered addictive. The RAM is a useful adjunct to other models explaining dependence and addiction to alcohol. But, according to its limitations, the RAM is not applicable to some aspects of public alcohol policy.

Supply and Demand Theory (SDT): The terms ‘supply’ and ‘demand’ form part of the comprehensive policy framework of harm minimisation (Lenton & Single 1998). SDT (Klein 1988; Marshall 2009) helps inform the relationships between alcohol availability and consumption behaviours (Godfrey 1989). SDT has limitations; it is essentially a broad economic theory that does not account for the risks and harms associated with a particular good or service. Without reference to the harms from specific products such as alcohol, the theory is restricted in application to public alcohol policy. SDT is useful to define the economics underpinning the availability and use of alcohol, and can help explain the

fluctuations evident in population consumption. Thus, according to SDT, the price of alcohol is always a consideration when a decision is made to purchase and consume alcohol (Godfrey 1989). Due to limitations, the theory does not fully explain the connections between supply, demand and harms, and is insufficient for broad public alcohol policy application.

Availability Theory (AT): AT has predictive strength in determining the effects of alcohol availability on consumption, risk and harms (Bruun et al. 1975; Single 1988; Stockwell & Gruenewald 2001). The theory encompasses a number of categories of alcohol problems. The assumptions of AT provide justification for the preventive effort to control alcohol in the public domain (Single 1988). According to Single (1988), no threshold exists where an individual suddenly acquires the risk of adverse consequences from drinking. Rather any level of consumption carries with it some risk, no matter how small, in accord with other evidence (National Health and Medical Research Council 2009). While differences exist between populations in the dispersion of alcohol consumption, these are in fact quite small (Bruun et al. 1975). Adoption of the primary tenets of AT would strengthen the evidence base for public alcohol policy and assist in disentangling relationships between availability, consumption and risk.

Conceptualisation of AT's key variables renders it representative of a number of other models, such as 'supply and demand' of SDT; and the harms related to addictive products and addictive consumption, as covered by the RAM. While AT is a broad population level theory, this is considered an advantage with reference to the environmental context of alcohol use. Despite a relatively long provenance, the theory is still germane to the current alcohol policy milieu. As such, the theory can be adopted due to the relevance to general alcohol risk, the overall use environment, and to public alcohol policy. AT is the most

comprehensive theory to apply at the population level, but it may have additional potential. The utility of the theory for at risk groups and local situations is explored later in the thesis, thus adding to the knowledge base for a public alcohol policy model.

While each of the three theories has some benefit for public alcohol policy, AT stands out as comprehensive in its coverage of supply, demand and harms related to alcohol. Caution is warranted. The “impacts of availability policy on the use of alcohol may be as heterogeneous as patterns of availability themselves” (Stockwell & Gruenewald 2001, p. 704). Other theories of focus complement AT. One informs associations between supply and demand for alcohol (SDT); the other acknowledges alcohol as an additive good performing differently in the marketplace from nonaddictive goods (RAM). But, AT (Bruun et al. 1975) as a general population theory does not provide a detailed account of drinkers’ demand apart from population level relationships. Neither does AT offer detailed explanation of drinking behaviours as the control factors, motivations, expectancies and perceptions that lead to the consumption of alcohol. In order for public alcohol policy to be more effective, drinkers’ responses need to be accounted for in policy framing and strategic practice. Theories that explain the behavioural attributes of alcohol consumption are next identified. The following discussion will increase understanding of theory for a public alcohol policy model, the basis of which is now established in the learnings associated with AT.

4.3 Stage Two: Identifying Theory Most Relevant to the Attributes of Consumption

Stage Two determines the behavioural theory that most informs alcohol consumption as *demand* for alcohol. The section outlines a rationale and criteria for investigating behavioural theories. Justification for the choice of a behavioural theory for alcohol policy

and a policy model is presented. According to DiClemente and colleagues (2002), behavioural theories are an economical way of combining assumptions and propositions to explain and predict human behaviour. Others suggest behavioural theory frames self-control and impulsiveness as a choice between sooner reward and later reward (Vuchinich & Simpson 1999), of relevance to alcohol consumption.

The following data bases were searched for all years to identify the theory of most relevance to this stage of the inquiry: AUSThealth, AUSTROM, CINHALL, MEDLINE, PubMed and SocINDEX. Search terms used are: ‘alcohol’, ‘attributes’, ‘behaviour’, ‘consumption’, ‘control’, ‘expectancies’, ‘framework’, ‘health’, ‘loss of control’, ‘model’, ‘motivations’, ‘perceptions’, ‘review’, and ‘theory’.

4.3.1 Discussion of Behavioural Theories of Interest

As a way of rationalising the choice of behavioural theory for public alcohol policy, reviews of health behaviour theory are discussed. A number of ‘stage’ theories are described as the most familiar theories of health related behaviour (Weinstein, Rothman & Sutton 1998). These are: the Theory of Reasoned Action (TRA) (Fishbein & Ajzen 1975); the Theory of Planned Behaviour (TPB) (Ajzen 1991; Ajzen & Madden 1986); the Health Belief Model (HBM) (Becker 1974; Becker & Maiman 1975); Protection Motivation Theory (Maddux & Rogers 1983); and Subjective Expected Utility Theory. These theories are tested against each other to establish similarities and differences of explanation and effect (Weinstein 1993). While not expressly considering the TRA as distinct from the TPB, the modification of the earlier theory with the additional variable of ‘perceived behavioural control’ is acknowledged by Weinstein (1993).

Other reviews seek to describe the coverage of theory in the health related literature, and to assess the proportion of behavioural research utilising relevant theory (Painter et al. 2008).

The most frequently referred to theories, outlined by Painter and colleagues (2008), are: the Social Cognition Theory (SCT) 27.5% (Bandura 1986); the Transtheoretical Model/Stages of Change (TTM) 27.5% (Prochaska & DiClemente 1992; Prochaska & Velicer 1997); the HBM 20.0% (Becker 1974; Becker & Maiman 1975); the TRA/TPB 15.9% (Ajzen 1991; Ajzen & Madden 1986; Fishbein & Ajzen 1975); and Social Networks/Social Support Theory 15.9%. Warnings against the conduct of ‘statistical horse races’ for theory, and the inevitable discard of the ‘loser’, is worthy of note (Nigg, Allengrante & Ory 2002). A more cautionary position acknowledges the utility of the most applicable theories to a given problem, together with some integration of less relevant theories to provide additional insights.

Adding to the relevance of theory to health behaviours, behavioural theory is conceptualised as ‘content specific’ or ‘content free’ (Ajzen 1998), useful demarcations when applying theory to a specific policy agenda like alcohol. While content free theory is relevant to many policy agendas, it must be applicable to a specific agenda in order for policy gains to be realised. The TPB is the most general and popular of the content free theories (Ajzen 1998). Ajzen (1998) describes SCT (Bandura 1986) as another of the general models relevant to all behaviours. Content specific models are listed by Ajzen (1998) as the HBM (Becker 1974; Becker & Maiman 1975); and the Perceptual Cognitive Approach (PCA) dealing with illness presentations (Leventhal, Levelthal & Contrada 1998). Noar and Zimmerman (2005) also list: the HBM, the TRA (Fishbein & Ajzen 1975), the TPB (Ajzen 1991; Ajzen & Madden 1986), the TTM (Prochaska & DiClemente 1992; Prochaska & Velicer 1997), and SCT (Bandura 1986) as applicable to various behaviours. These five theories are likewise discussed in relation to health behaviour change (Nutbeam, Harris & Wise 2010).

Within a process of selection, those theories less relevant should not be entirely discarded (Nigg, Allengrante & Ory 2002). Rather their strengths in relation to alcohol use and alcohol policy are important; some are referred to elsewhere in the thesis. A number of theories are less known, such as the PCA (Leventhal, Levelthal & Contrada 1998) mentioned by Ajzen (1998); or less utilised like Social Networks Theory noted by others (Painter et al. 2008). These two theories are not included in Noar and Zimmerman's (2005) list. A decision is made not to subject these lesser known theories to further scrutiny; these are judged as more limited in representing the complexities of alcohol use and alcohol policy. There are, however, a number of theories able to be successfully applied to behavioural change related to alcohol (Webb, Sniehotta & Miche 2010). The behavioural theory most applicable to alcohol outcomes and alcohol policy is now sought.

4.3.2 Analysis of Behavioural Theories of Focus

In order to select a behavioural theory to inform public alcohol policy, the most useful models, as determined by others, receive attention (Noar & Zimmerman 2005; Nutbeam, Harris & Wise 2010; Painter et al. 2008). These theories are investigated in relation to the attributes of consumption behaviours that result in *demand* for alcohol. The key behavioural attributes against which the theories are analysed are: '*control/loss of control*'; '*motivations and expectancies*'; and '*perceptions*'; as the dominant attributes of alcohol demand and drinking behaviours discussed in the literature review. Behavioural theories contain various constructs of control, motivations and perceptions in explanation of alcohol use (*Table Two*).

Table 2: Behavioural Theory and the Attributes of Consumption

Behavioural Theory	Control/ Loss of Control	Motivations and Expectancies	Perceptions
Health Belief Model (HBM) Becker, 1974; Becker & Maiman, 1975. A social psychological theory of beliefs and decision making in response to health related cues	Not a specific focus of the model	Motivations and expectancies based on the perceived benefits and costs of health related behaviour Motivations also relate to treatment effectiveness and adherence to a medical regimen	Perceived likelihood of experiencing a health condition, the probable severity of the condition, personal vulnerability to the disease or condition, and the anticipated effectiveness of a proposed health regimen
Social Cognitive Theory (SCT) Bandura, 1986. A social cognitive theory of health related behaviour involving proximal and distal goals	Not an explicit component of the model	Outcome expectancies regarding environmental cues, social expectations, and own behaviour	Perception of behavioural control is conceptualised as self-efficacy, the belief that one can perform a particular behaviour in specific circumstances, rather than the notion of locus of control
Transtheoretical Model (TTM) Prochaska & DiClemente, 1992; 1997. A model of decision making, otherwise known as the ‘Stages of Change’	Not a specific inclusion of the model	The balancing of benefits and costs that occur in the ‘contemplation’ stage are closely aligned with expectancies and motivations in relation to behaviour change	Self-efficacy is primarily conceptualised in relation to the prevention of relapse, particularly in a therapeutic context
Theory of Reasoned Action (TRA) Fishbein, 1975. The TRA is conceptualised for behaviour that is entirely volitional	Loss of control is not an inclusion of the model, as the TRA is only valid for behaviour that is entirely volitional	Motivations and expectancies are related to attitudes, intentions and social norms	Perceptions primarily based on the social norms concept, as how acceptable a behaviour is to significant others, and the influence this view has on behavioural performance
Theory of Planned Behaviour (TPB) Ajzen & Madden, 1986; Ajzen, 1991. The TPB is conceptualised for behaviour that is not entirely volitional, such as alcohol use	Control and loss of control conceptualised in the model - the TPB is valid to explain behaviour that is not entirely volitional The predictive power of ‘perceived behavioural control’ is pivotal	All the primary variables of TPB contribute to behavioural motivation The ‘perceived behavioural control’ variable is proposed by the authors of the theory to be able to represent all the motivations, expectancies and intentions contributing to behaviour	The addition of the ‘perceived behavioural control’ variable, over and above the TRA, adds to the prediction of behaviour not under the control of the doer In a variation of the TPB, ‘perceived behavioural control’ directly impacts on behaviour and bypasses intention altogether

4.3.3 Choice and Justification of a Behavioural Theory

The *Health Belief Model* (HBM) is a social psychological theory of the beliefs and decisions that arise in response to health related cues (Becker 1974; Becker & Maiman 1975). The HBM determines that a decision leading to health related behaviour is primarily associated with health benefits, consequences and costs. Perceptions of the susceptibility to an illness, the possible severity of the illness or condition, and the perceived benefits and costs of taking a particular course of action are all fundamental concepts of the HBM (Rosenstock, Strecher & Becker 1988). The model focuses on two aspects of behaviour: threat perception and behavioural evaluation (Sheeran & Abraham 1996). In the HBM, health related motives are based on the perceived value of reducing health threats; the perception of behavioural barriers is related to self-efficacy (Rosenstock, Strecher & Becker 1988). The concepts of 'control' and 'loss of control' are not a focus of the HBM.

The greatest weakness in applying the HBM to public alcohol policy is the lack of conceptualisation of control and loss of control, important factors in alcohol use and alcohol related harms (American Psychiatric Association 2000; Heather 1995). Another weakness of the HBM is a primary concern with avoidance of illness, despite use of the theory in preventive health behaviour (Janz & Becker 1984). Nonetheless, the HBM is valuable (Becker 1974; Becker & Maiman 1975). The HBM can predict an individual's avoidance of drinking as a health related risk and represent a decision to access the health system for alcohol problems. The theory could be useful in explaining behaviours not immediately identified as health associated. A case in point is drinking and driving, not overtly an illness linked action. But, if drink driving is viewed as a health risk, the HBM can encompass this behaviour, with the health consequences and costs of drink driving

able to be represented by the theory. But the HBM does not present a convincing explanation of all alcohol related behaviours, or for alcohol policy more generally.

The HBM correlates more strongly with some behaviours than others', and fits best with actions that are less repetitive (Kirscht 1988), reducing its relevance to alcohol consumption. The HBM proves useful in early intervention initiatives for alcohol, such as screening for health risk (Becker 1974; Becker & Maiman 1975). In addition, the HBM could be used in conjunction with other models, like the TRA (Fishbein & Ajzen 1975), to predict health related behaviours that are entirely volitional. As previously discussed, alcohol use is subject to loss of control (American Psychiatric Association 2000; Heather 1995). Hence, the general application of the HBM to public alcohol policy has considerable limitations. The HBM does not recommend particular interventions to improve health behaviours; the greatest contribution is in relation to health education encompassing attitude and belief dimensions (Janz & Becker 1984).

Social Cognitive Theory (SCT) is focused on expectancies about environmental cues, self-efficacy and behavioural outcomes (Bandura 1986; Rosenstock, Strecher & Becker 1988). SCT is a social cognitive theory of health related behaviour conceptualising: proximal and distal goals; physical, social and self-evaluative outcome expectancies; beliefs about self-efficacy; and beliefs about personal and situational impediments in contrast to health system impediments (Ajzen 1998). A distinction is drawn between 'locus of control': a generalised notion about the self; and 'self-efficacy': concerning personal abilities in specific settings (Rosenstock, Strecher & Becker 1988). Rosenstock and others (1998) acknowledge the contributions of SCT to behavioural knowledge as increased understanding of the role of expectations in motivational reinforcement, and the introduction of self-efficacy as a notion of efficacy expectation rather than outcome

expectation. Self-efficacy as a concept of SCT is closely aligned with the TPB variable of 'perceived behavioural control' (Ajzen 1991; Ajzen & Madden 1986). In some research of the TPB in alcohol related situations, self-efficacy is used as a proxy for perceived behavioural control (Johnston & White 2003).

But SCT does not define barriers or costs associated with a particular action (Rosenstock, Strecher & Becker 1988). SCT does share many of the strengths of the HBM (Becker 1974; Becker & Maiman 1975) and the TPB (Ajzen 1991; Ajzen & Madden 1986); behaviour is thereby explained through a number of interrelated variables. The underlying complexity of behaviour is acknowledged. According to Ajzen (1998), SCT foregoes some utility in dividing the categories of the TPB into further subsystems of behaviour. The identification of a number of cognitions that lead to behavioural action makes SCT of some use to public alcohol policy. Loss of control is not a consideration in SCT, limiting its universal application to alcohol use behaviours and alcohol related outcomes. With loss of control not conceptualised in the theory, SCT is of limited relevance to alcohol policy and the development of a public alcohol policy model.

The *Transtheoretical Model (TTM)*, otherwise known as the 'Stages of Change' (Prochaska & Velicer 1997), is a framework of decision making involving five discrete stages: precontemplation, contemplation, preparation, action, and maintenance. The TTM is conceptualised to enlighten and facilitate change in health harming behaviour, and is used as a therapeutic tool in treatment for addiction. In the TTM: precontemplation represents the period before an individual even thinks about changing; contemplation is when an individual seriously considers behavioural change; preparation is about getting ready for the proposed change; action is when the behavioural change is accomplished; and maintenance is about sustaining the change in behaviour.

The balancing of benefits and costs that occur in the contemplation stage of the TTM are closely aligned with the expectancies and motivations of other theories. The threat of relapse and the capacity to avoid this occurrence with addictive behaviours are essential to the model; self-efficacy is strengthened by supportive and therapeutic relationships within a treatment context. When applied to actions more generally, the TTM provides a framework to understand general behavioural change (Prochaska & DiClemente 1992; Prochaska & Velicer 1997). In reality, increments of behaviour change are not so clear cut, with a linear model such as the TTM presenting a rather simple explanation for what is a highly complex undertaking. As well, due to the lack of conceptualisation of loss of control, the TTM does not fully represent behavioural attributes related to alcohol consumption.

The *Theory of Reasoned Action (TRA)* explains and predicts behaviours that are under the volitional control of the doer (Fishbein & Ajzen 1975). With the TRA, the primary variables of *attitudes*, *social norms* and *intention* lead to the achievement of behaviour. Loss of control is not an inclusion in the model, as the TRA is only valid for behaviours that are completely volitional. In the theory, motivations and expectancies are related to attitudes, intentions, and social norms as the expectation that others approve or disapprove of the behaviour in question, or might undertake similar behaviour themselves.

Perceptions are based on the social norms concept as the acceptability of a given behaviour to significant others (Hughes 2008), as well as the influence others have on one's intention to perform behaviour (Fishbein & Ajzen 1975). Within these explanations, the TRA has the potential for a greater range of influence than the HBM (Weinstein 1993). Behavioural consequences within the TRA are viewed not only as health outcomes, but also as outcomes unrelated to health (Weinstein 1993). As a precursor to the TPB (Ajzen 1991;

Ajzen & Madden 1986), the TRA is unable to predict and explain behaviours where loss of control is a risk, and is less functional than the TPB in explaining alcohol use.

The *Theory of Planned Behaviour (TPB)* is conceptualised for behaviours not entirely volitional (Ajzen 1991; Ajzen & Madden 1986), like alcohol use. The variables of the TPB represent the control factors, motivations, expectancies and perceptions that lead to an intended behaviour. Primary variables are *attitudes*, *social norms*, and *perceived behavioural control*; these directly influence *intention*. The addition of the perceived behavioural control variable, over and above the TRA (Fishbein & Ajzen 1975), contributes to the prediction of behaviour not under the control of the doer. In a variation of the original TPB, perceived behavioural control directly impacts on behaviour and bypasses intention altogether. Like the TTM (Prochaska & DiClemente 1992; Prochaska & Velicer 1997), the stages leading to specific behaviour may not be as definitive as portrayed by the TPB. According to the second version of the TPB, as intentions do not always culminate in behaviour, behavioural outcomes are more accurately predicted through perceived behavioural control.

Of the five theories matched against key attributes of alcohol behaviour, only the TPB comprehensively covers control/loss of control, motivations and expectancies, and perceptions. The perceived behavioural control variable represents all the motivations and intentions that contribute to behaviour (Ajzen 1991; Ajzen & Madden 1986). As a stage theory, the TPB accommodates the influence of internal factors: control, motivations and perceptions of behaviour; and external factors: environmental impacts and the social norms of significant others (Hughes 2008; Hughes et al. 2008). Unlike the TRA (Fishbein & Ajzen 1975), the TPB accounts for loss of control as a behavioural possibility, and is the

only theory of those reviewed to specifically do so. Within the analysis of theory for alcohol behaviour and alcohol policy, the issue of loss of control is pivotal (Heather 1995).

There is much overlap between the HBM, the TRA, and SCT. The TTM displays some similarities with these other models. All the theories of behaviour reviewed refer in some way to the concepts of motivations, expectancies and perceptions. Each of the models could be applied to alcohol use, and each would have some place in public alcohol policy. Due to the limitations of the HBM, the TTM, the TRA, and SCT, these theories are not considered suitable for general application to alcohol related behaviours, or as primary contributors to the development of a public alcohol policy model. Loss of control, as a key determinant of problems with alcohol, receives little attention in all but the TPB.

Acknowledgement of loss of control as a behavioural possibility, and perceived behavioural control as a pivotal variable, renders the TPB of particular interest for public alcohol policy. As a content free model, applicable to a wide range of alcohol associated behaviours, the TPB (Ajzen 1998) is confirmed with potential to inform public alcohol policy and a public alcohol policy model for Australia.

Summary: Two theories are identified that comprehensively address environmental and behavioural aspects of alcohol use. Availability Theory (AT) sheds light on the availability of alcohol at the population level through links with the variables of consumption and harms. Complementing this knowledge, the Theory of Planned Behaviour (TPB) clarifies the actions and perceptions of drinkers as they negotiate the alcohol use environment. These theories therefore, AT and the TPB, are crucial in understanding alcohol as a pressing public policy concern. The TPB and AT have not previously been combined to inform alcohol consumption behaviours in the use environment. The theories are disparate; one is a population level theory and the other a

theory of behavioural action. Differences between the theories are an advantage when seeking to inform public alcohol policy and a public alcohol policy model. Each theory suggests a different level of intervention for alcohol use and consumption behaviours. While both theories reveal predictive and explanatory strength, they have not been concurrently applied to alcohol use or public alcohol policy.

Both theories are valuable in anticipating drinking outcomes, similar in scale of importance, but different in application within an alcohol policy context. AT enlightens the alcohol use environment and makes clear the associations between alcohol availability, consumption and harms (Bruun et al. 1975). AT provides information for developing interventions at the population level. The TPB demonstrates predictive strength, particularly through the variable of perceived behavioural control (Ajzen 1991; Ajzen & Madden 1986). In this regard, the TPB will likely assist in the development of interventions for at risk groups where loss of control is an issue. Together, these two theories afford predictive value in a range of drinking settings and scenarios.

Consideration of AT and the TPB is recommended for public alcohol policy in Australia. The two theories help verify the underlying premise of this thesis: that valid theory *can* inform public alcohol policy and a policy alcohol policy model. The development of alcohol policy related to public availability and personal control can be anticipated within the theoretical frameworks of AT and the TPB. Substantiation of this position will next be sought from analysis of the population level evidence that underpins AT. Investigation of the variables represented by AT will further validate these claims.

Chapter 5: Investigating Availability Theory for Alcohol Policy

5.1 Introduction: Using Availability Theory for Public Alcohol Policy

The chapter further investigates Availability Theory (AT) (Bruun et al. 1975) for public alcohol policy and a public alcohol policy model. Whether a key variable of AT is significant enough to be used on its own in alcohol policy is kept to the fore. AT has, as a fundamental precept, strong causal associations between availability, consumption and harms at the population level. According to the theory, harms are affected directly by consumption, and indirectly by availability through consumption. Corresponding with the claims of AT, the theory is representative of a research perspective on ‘availability’, ‘consumption’ and ‘harms’. The ‘harms’ variable of AT is conceptualised differently according to investigative focus over time: originally, in relation to ‘heavy users’ (Bruun et al. 1975); next, as ‘alcohol related problems’ (Single 1988); and later in association with ‘at risk users’ (Stockwell & Gruenewald 2001). Consistent with these claims, the links between availability and consumption and the risk of injury, disease and death need further clarification. Demand for alcohol, as aggregate consumption, is a pivotal variable of AT. These relationships are not fully informed by AT; associated evidence clarifies the connections.

AT embodies a continuum of ever increasing risk from increasing availability and increasing consumption, reflective of the general notion of population level harms. This position bears affinity with the 2009 Australian Alcohol Guidelines, determining there is no level of consumption of alcohol that is risk free; risk increases exponentially with increased consumption (National Health and Medical Research Council 2009). However, according to AT, when population consumption increases, the prevalence of heavy users is

likely to increase (Bruun et al. 1975). “A population can be viewed as a network of interconnected actors” (Skog 1985, p. 97). It can be assumed heavy drinkers in a population include those physiologically dependent on alcohol. Heavy drinkers experience considerable physical, psychological, and social harms as a result of their drinking (American Psychiatric Association 2000). Even so, there is no clearly defined ‘alcoholic’ population at the right hand tail of alcohol distribution (Miller & Agnew 1974).

Within universal contexts, such as those described by AT, the prediction of harms from alcohol availability is more certain. This position has support. The most effective interventions are those impacting on the environmental context of use (Babor et al. 2010; Loxley et al. 2004; Norman, Bennett & Lewis 1998). AT’s basis, that alcohol harms are predicated on population availability and aggregate consumption, could be a key to future alcohol policy success. The impact of alcohol availability on local environments and subpopulations at risk is likewise advanced as a significant policy concern. Social phenomena are complex and need to be subject to analysis at an equivalent level of complexity (Strauss 1987). Analysis of the literature in support of AT could disentangle the relationships that drive alcohol problems and determine the relevance of the theory for public alcohol policy.

Substantiation of the claim that AT can inform alcohol policy is next sought from a research perspective. Many of the problems with current alcohol policy (National Drug Strategy 2006) could be overcome through reference to AT (Bruun et al. 1975; Single 1988; Stockwell & Gruenewald 2001) and related research. The investigation to follow occurs in two stages: *Stage One* analyses the evidence of AT’s validity at population and situational levels; and *Stage Two* analyses the links between perceived availability, alcohol

consumption and harms. In these ways the literature is synthesised in relation to alcohol policy and a public alcohol policy model.

5.2 Stage One (*Step One*): Analysis of Availability Theory for Alcohol Outcomes and Alcohol Policy

5.2.1 Selection of Studies for Analysis

Step One analyses the population level evidence in support of the primary associations of AT. The following data bases were searched for all years to identify the relevant literature: AUSThealth, AUSTROM, CINHAL, MEDLINE, PubMed and SocINDEX. Google Scholar was also utilised. Search terms used are: ‘aggregate’, ‘alcohol’, ‘all-cause’, ‘annual sales’, ‘availability’, ‘Availability Theory’, ‘consumption’, ‘harms’, ‘morbidity’, ‘mortality’, and ‘per capita’. Overall, twelve studies are identified with relevance to the inquiry. Of these, two studies are not subject to further scrutiny. Excluded studies report on ‘alcohol units per week/drinks per day’ (Allen et al. 2009; Colhoun et al. 1997) rather than annual per capita consumption. Survey based data, on which the excluded studies are based, has limitations (McCambridge & Kypros 2009). Aggregate measures are the more reliable estimate of the quantity of alcohol available for consumption (Bloomfield et al. 2003). Altogether, ten studies based on aggregate consumption measures are analysed. These studies are important as they illustrate population level associations between availability, consumption and harms for western countries of focus.

5.2.2 Results of Analysis of Aggregate Studies

Population level evidence from countries of focus provides knowledge for public alcohol policy in Australia. The research reviewed is primarily European and originates from the following regions: European Union countries plus Canada and the United States of

America (Norstrom & Ramstedt 2005); European Union countries plus Norway (Hemstrom 2001); fourteen European countries (Norstrom 2001; Ramstedt 2001a, 2001b; Rossow 2001; Skog 2001a, 2001b); and Sweden (Norstrom 2006). A Canadian specific investigation is also analysed (Ramstedt 2005).

The first step of *Stage One*:

- demonstrates the claims of AT that the level of per capita alcohol consumption and the extent of alcohol harms are closely aligned with the availability of alcohol at the population level (Bruun et al. 1975); and
- confirms the position that relationships between availability, aggregate consumption and harms can inform alcohol policy.

Results are reported in the following categories: '*Review of Aggregate Studies*' (N=1); and '*Aggregate Studies Reporting on Relationships between Consumption and Harms at the Population Level*' (N=9). For each category, findings are presented in alphabetical order by first author. Most of the studies in the second category are included in the Norstrom and Ramstedt analysis (Norstrom & Ramstedt 2005). These investigations are identified by the specific marker '+'. Comparable research conducted since that time is also analysed (Norstrom 2006). Data and research methods are described; significant relationships between availability as aggregate consumption, and alcohol related harms are reported (*Table Three*).

Table 3: Relationships between Aggregate Population Consumption and Alcohol Related Harms

Review of Aggregate Studies (N=1)		
Authors, Year and Data	Research Focus and Methods	Significant Relationships
Norstrom & Ramstedt, 2005 Data Source: existing studies of 16 countries	Alcohol related mortality Research Methods: literature review and analysis	All-cause mortality; liver cirrhosis and other alcohol related diseases; accident mortality, homicide and suicide (No systematic link with IHD mortality at the population level)
Aggregate Studies Reporting on Relationships between Consumption and Harms at the Population Level (N=9)		
Authors, Year and Data	Research Focus and Methods	Significant Relationships
+ Hemstrom, 2001 Data Source: IHD mortality - WHO Mortality Data Base; Alcohol sales - Brewers Assn of Canada Data Adjusted For: lag effect of alcohol sales per capita, age adjusted IHD mortality rates, tobacco use	Ischaemic heart disease mortality Research Methods: Box Jenkins method of time series analysis	No cardioprotective effect is evident at the population level Other significant associations: a slight cardioprotective effect of alcohol for 30-44 year old women in high consumption countries
+ Norstrom, 2001 Data Source: male all-cause mortality - WHO Mortality Data Base; Alcohol sales - Brewers Assn of Canada Data Adjusted For: age standardised mortality rates	All-cause mortality in 14 European countries Research Methods: Box Jenkins method of time series analysis, pooled estimates	All-cause mortality In no country does a reduction in mortality follow an increase in consumption (No significant impact of alcohol in the youngest age group when mortality from disease is used as the outcome measure)
Norstrom, 2006 Data Source: sickness data - Statistics Sweden; Alcohol sales - Brewers Assn of Canada Data Adjusted For: real wages, unemployment status	Sickness absence Research Methods: Box Jenkins method of time series analysis	Increase in sickness absence for men (No significant correlation for women) Other significant associations: unemployment for both men and women
+ Ramstedt, 2001 (a) Data Source: suicide mortality - WHO Mortality Data Base; Alcohol sales - Brewers Assn of Canada	Suicide in 14 European countries Research Methods: Box Jenkins method for time series analysis, standard	Low consumption countries - suicide rates for males and females; medium consumption countries - suicide rate for females

Data Adjusted For: alcohol use trends, mortality statistics trends	error of pooled estimates	(No significant relationship for suicide rates in high consumption countries) Other significant associations: drinking culture defined as representative of low post-war per capita consumption
+ Ramstedt, 2001 (b) Data Source: cirrhosis mortality - WHO Mortality Data Base; Alcohol sales - Brewers Assn of Canada Data Adjusted For: yearly change in per capita consumption and age specific mortality rates	Liver cirrhosis mortality in 14 European countries Research Methods: Box Jenkins method of time series analysis, standard error of pooled estimates	Pooled all countries - liver cirrhosis mortality males and females Other significant associations: alcohol effect larger for men than women
+ Ramstedt, 2005 Data Source: suicide mortality - Statistics Canada; Alcohol sales - Statistics Canada Data Adjusted For: age standardisation, yearly change in alcohol and suicide data, unemployment	Suicide at the population level in Canada Research Methods: Box Jenkins method of time series analysis, standard error of pooled estimates	Total suicide rate as well as males and females separately Other significant associations: stronger association for women
+ Rossow, 2001 Data Source: age standardised homicide rate - WHO statistics; Alcohol sales – registered alcohol sales from the countries of focus Data Adjusted For: age standardisation, yearly changes in alcohol and homicide data	Homicide: a cross cultural comparison of relationships in 14 European countries Research Methods: Box Jenkins method of time series analysis, pooled estimates	Total homicides rate Other significant associations: drinking culture characterised by heavy drinking episodes
+ Skog, 2001 (a) Data Source: accident mortality - WHO Mortality Data Base; Alcohol sales - Brewers Assn of Canada Data Adjusted For: long term trends	Accident mortality rates for traffic accidents, accidental falls, and other accidents in 14 western European countries Research Methods: Box Jenkins method of time series analysis, pooled estimates	Pooled all countries - fatal traffic accidents: males and females; fatal accidental falls: males and females; other fatal accidents: males but not females Other significant associations: greater effect where drinking to high levels of intoxication is more common (Reliable and comparative evidence of differences in drinking culture is missing)

<p>+ Skog, 2001 (b)</p> <p>Data Source: accident mortality - WHO Mortality Data Base; Alcohol sales - Brewers Assn of Canada</p> <p>Data Adjusted For: long term trends</p>	<p>Overall accident mortality in 14 European countries</p> <p>Research Methods: Box Jenkins method of time series analysis, standard error of pooled estimates</p>	<p>Pooled groups of countries</p> <p>Other significant associations: total accident mortality rate (male accident mortality is four times as large as females)</p>
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Note: The studies analysed above use alcohol sales data as a proxy measure for population consumption. Detail regarding the Box and Jenkins method of time series analysis is originally covered in the text *Time Series Analysis: forecasting and control* (Box & Jenkins 1976).

5.2.3 Discussion of Results (*Stage One - Step One*)

Results of the analysis confirm the strength of population level relationships between availability and consumption as aggregate sales data, and alcohol related harms. The primary tenets of AT (Bruun et al. 1975) are supported. All-cause mortality is significantly affected by variations in the level of consumption (Norstrom & Ramstedt 2005). These associations are such that the greater the aggregate consumption of alcohol, the greater the prevalence of alcohol mortality. “Total mortality is a classic indicator of the overall health of the population” (Norstrom & Ramstedt 2005, p. 126). The methods used in the aggregate studies reviewed by Norstrom and Ramstedt (2005) are, primarily, time series analyses based on autoregressive integrated moving average (ARIMA) modelling. According to findings, when population consumption increases by one litre of pure alcohol per capita, the prevalence of alcohol related diseases and other harms likewise increases (Norstrom 2006; Norstrom & Ramstedt 2005; Ramstedt 2001a, 2001b, 2005; Skog 2001a, 2001b). In approximately half the countries of focus in the research of Norstrom and Ramstedt (2005), significant relationships are demonstrated between per capita consumption and mortality from accidents and homicide. Relationships are also evident between alcohol consumption and suicide in most regions, but, in the middle and south of Europe, these links are less obvious. The difference between regions of Europe in suicide prevalence is likely due to a predominance of post-war ‘wet’ or ‘dry’ drinking cultures that influence consumption levels and drinking patterns (Ramstedt 2001a).

A number of investigations adjust for demographic variables such as age (Hemstrom 2001; Norstrom 2001; Ramstedt 2001b, 2005; Rossow 2001). Other studies consider: the lag effect of alcohol sales (Hemstrom 2001); annual change in population consumption and related mortality (Ramstedt 2001a, 2001b, 2005; Rossow 2001); long term trends (Skog 2001a, 2001b); and other risk factors such as tobacco use (Hemstrom 2001). Wages and

unemployment status are also adjusted for (Norstrom 2006; Ramstedt 2005). Drinking culture is not controlled for as a variable in any studies, but is reported as having some part to play in suicide (Ramstedt 2001b) and homicide prevalence (Rossow 2001). “Reliable and systematic comparative evidence of differences in drinking culture is still missing” (Skog 2001a, p. 57).

Significant relationships are apparent between alcohol consumption and a number of alcohol related conditions. Associations are evident between per capita consumption and mortality from liver cirrhosis (Norstrom & Ramstedt 2005). Liver cirrhosis is strongly affected by alcohol consumption, estimated using standard errors for pooled all countries: males (0.126) $p < 0.001$, and females (0.085) $p < 0.001$ (Ramstedt 2001b). Positive associations between alcohol and the prevalence of suicide are also revealed using standard errors for pooled estimates; effects vary according to whether a country has a low, medium or high level of population consumption (Ramstedt 2001a). Associations between consumption and suicide are shown to differ for males (0.038) $p < 0.001$, when compared with females (0.066) $p < 0.05$, using standard error estimates (Ramstedt 2005).

Other significant associations are evident for overall accident mortality in fourteen European countries, utilising the standard error of pooled all age groups: males (1.82) $p < 0.001$, females (0.45) $p < 0.001$ (Skog 2001b). Similar research methods investigate mortality rates, with positive associations for fatal traffic accidents: males (1.28) $p < 0.001$, females (0.38) $p < 0.001$; fatal accidental falls: males (0.40) $p < 0.001$, females (0.07) $p < 0.05$; and other fatal accidents: males (0.55) $p < 0.01$, with no significant association for females (Skog 2001a). Also noteworthy is an association between an increase in sickness absence in men and a one litre increase in per capita alcohol consumption, estimated using logarithmic modelling (0.13) $p < 0.05$ (Norstrom 2006). Significant relationships are also

evident between total alcohol sales and homicides, measured as a regression coefficient (0.085) $p < 0.001$ (Rossow 2001).

According to these findings, a significant increase in alcohol harms occurs at the population level when annual per capita consumption increases by one litre of pure alcohol. However, no cardioprotective effect from alcohol is demonstrated at the population level (Hemstrom 2001; Norstrom & Ramstedt 2005); benefit to heart health from alcohol consumption is challenged by these findings. There are no Australian studies utilising similar methods to the research reviewed above (*Table Three*). Yet, apparent consumption figures are estimated annually by the Australian Bureau of Statistics (Australian Bureau of Statistics 2010-11). These calculations inform various research findings, such as the rise and fall in a number of hospital based indicators of alcohol harms that occurs with a rise and fall of per capita alcohol consumption (Chikritzhs et al. 2003). Findings validate population level relationships between alcohol availability, consumption and harms, and confirm a direction for population level alcohol policy for Australia.

5.2.4 Discussion of Policy Relevance

All-Cause Mortality: There are a number of policy inferences drawn from the analysis of population studies. According to research (Norstrom 2001; Norstrom & Ramstedt 2005), an increase in population consumption is associated with an increase in all-cause mortality. In the studies reviewed, there is no evidence of a decrease in alcohol related mortality where an increase in population consumption occurred. However, overall, stronger effects are apparent from a one litre change in annual consumption in northern Europe and Canada than in the middle and south of Europe. Statistically significant relationships are evident between per capita consumption and mortality from alcohol related diseases, including liver cirrhosis, in all countries under review (Norstrom &

Ramstedt 2005). Taking these results into account, if all-cause mortality is to be reduced in Australia, alcohol policy should aim to reduce annual per capita consumption by one litre of pure alcohol.

Liver Cirrhosis, Sickness Absence: In a comparable way, to decrease liver cirrhosis mortality across a population, alcohol policy can aim to reduce annual per capita consumption by one litre of pure alcohol. A reduction in the overall level of consumption will reduce the prevalence of liver cirrhosis mortality for both males and females (Ramstedt 2001b); these affects are demonstrated across a number of countries, as well as across different demographic groups. Associations are also evident between per capita consumption and sickness absence in men (Norstrom 2006), a study postdating Norstrom and Ramstedt (2005). A relationship between per capita consumption and sickness absence is not evident for women in the later study (Norstrom 2006). The lack of effect could result from differences in alcohol consumption between men and women, but may also result from a greater willingness of women to attend work when unwell, a possibility not discussed by the study authors. Nonetheless, alcohol policy directed towards sickness absence is indicated. To reduce sickness absence particularly for men, per capita consumption needs to correspondingly reduce.

Homicide, Accident Mortality: It is also clear that alcohol policy, if it is to reduce the prevalence of homicides across a population, needs to reduce overall per capita consumption as well as heavy drinking episodes. The findings of Norstrom and Ramstedt (2005) associated with acute health harms, such as accidents and homicides, are consistent with results of another investigation. While research results are not uniform across regions and drinking cultures, a relationship with homicide is evident in countries where consumption is characterised by heavy drinking episodes (Rossow 2001). Behavioural

factors account for some association between alcohol consumption and health harms, an issue discussed in following chapters. Population level effects are evident between changes in aggregate consumption and overall accident mortality (Skog 2001b), fatal motor vehicle traffic accidents, and accidental falls (Skog 2001a). Skog (2001b) states “the absence of decreasing trends in accident mortality rates in many European countries was due to increasing levels of alcohol consumption” (p. 45). Therefore, in order to reduce overall accident mortality rates, alcohol policy can aim to reduce overall per capita consumption.

Suicide: Moreover, to reduce suicide rates across a population for both genders, alcohol policy can aim to reduce annual per capita consumption by one litre of pure alcohol. Significant relationships are evident between population level consumption and suicide (Ramstedt 2001a, 2005), also contributing to all-cause mortality (Norstrom & Ramstedt 2005). A one litre increase in per capita consumption is associated with a significant change in European suicide rates for both males and females, specifically in low consumption countries (Ramstedt 2001a). For medium consumption countries, the female suicide rate is most affected by the level of alcohol consumption. In high consumption countries, there appears to be no relationship between alcohol consumption and suicide. Studies cite cultural factors, drinking patterns, the composition of alcohol abusers, and systems of social control as additional determinants of suicide (Ramstedt 2001a, 2005). Personal control factors may also come into play, a concept discussed in detail in the following chapter. It is deduced from these suicide related findings that culture has some part to play in alcohol harms, but cultural effects are not always apparent in population level data and, therefore, are not generally a reliable basis for population level alcohol policy.

Ischaemic Heart Disease: There is no evidence of a systematic link between aggregate consumption and ischaemic heart disease (IHD) mortality at the population level (Norstrom & Ramstedt 2005). Aggregate data reveals the absence of a cardioprotective effect at the population level (Hemstrom 2001). This finding is consistent with other research challenging the assumption of heart benefit from alcohol consumption (Apfel & Andkjaer 2001; Fillmore et al. 2006; Hart et al. 1999), as covered in the literature review. Australian research supports this finding (Liang & Chikritzhs 2010). Taking these relationships into account, it is clear that public alcohol policy should not promote population level alcohol consumption as a way to reduce the risk of IHD mortality.

It is evident from the studies analysed above that the primary tenets of AT, associations between population availability, aggregate consumption and harms, can be applied to the prevention of alcohol related morbidity and mortality. Accordingly, there are a number of conditions and diseases able to be forestalled through limiting availability and reducing consumption. It is also possible these associations can help inform a model for public alcohol policy. This position is consistent with Babor and colleagues (2003, 2010) and Loxley and associates (2004): regulating population availability is a clearly evidenced policy approach to reducing consumption and decreasing harms. The position is also consistent with that of Norstrom and Ramstedt (2005) revealing strong links between alcohol availability as alcohol sales, aggregate consumption, and the prevalence of all-cause mortality across a number of countries of focus.

5.2.5 Significant Findings

From the research reviewed, the connections between availability and consumption as aggregate sales data, and the prevalence of harms are evident. While these effects differ according to circumstance, what is common to all are strong relationships between availability, consumption and harms, as represented by AT (Bruun et al. 1975; Single 1988; Stockwell & Gruenewald 2001). *Population availability and aggregate consumption* are linked to a number of chronic and acute harms such as:

- **all-cause mortality related to liver cirrhosis and other diseases, suicide, accidents and homicide** (Norstrom & Ramstedt 2005);
- **all-cause mortality, especially male** (Norstrom 2001);
- **liver cirrhosis mortality** (Ramstedt 2001b);
- **sickness absence for males** (Norstrom 2006);
- **suicide** (Ramstedt 2001a, 2005);
- **homicide** (Rossow 2001);
- **overall accident mortality** (Skog 2001b); and
- **fatal motor vehicle traffic accidents, accidental falls and other accidents** (Skog 2001a).

Overall, alcohol policy can aim to reduce annual per capita consumption by one litre of pure alcohol to decrease the prevalence of all-cause mortality, liver cirrhosis and other alcohol diseases, accidents, homicide, and in some circumstances, suicide. These findings are used to build a public alcohol policy model for Australia.

The measures known to reduce alcohol harms across populations are legislative: to reduce availability and consumption of alcohol; regulatory: to enforce existing liquor licensing

requirements; and economic: to increase excise and establish volumetric taxation (Babor et al. 2010; Doran et al. 2010; Loxley et al. 2004). One area where no population effect of availability and consumption is evident is mortality from ischaemic heart disease (Hemstrom 2001; Norstrom & Ramstedt 2005). This particular finding is central to the framing of population alcohol policy in that the promotion of alcohol use for health benefit is not supportable. According to the review of aggregate studies from a number of countries and researchers' findings of relevance to alcohol policy, the utility of AT to inform population level alcohol policy is established. For alcohol interventions to be more effectively constructed with respect to AT is a thesis recommendation. Further investigation will now be undertaken to determine the relevance of AT for local environments and community settings.

5.3 Analysis (*Stage One - Step Two*): Investigation of availability, consumption and harms in situational environments

The second step of *Stage One*:

- confirms associations between availability, consumption and harms in situational environments; and
- establishes an evidence base for AT to inform alcohol policy for local situations and community settings.

Situational availability is examined as those circumstantial, social and other factors that impinge on access to alcohol, a position consistent with others (Smart 1980). Evidence from alcohol related settings helps clarify relationships between *situational availability* and alcohol related risk. This inquiry reflects the position of Single (1988): “future work should focus on the less well studied connections between availability and alcohol

problems, and on the influence of the individual's social network and situational determinants of drinking behaviour" (p. 343).

Situational availability of alcohol is associated with risk and harms in a number of circumstances. These are:

- **the distance travelled to obtain alcohol** (Huckle et al. 2008; Rush, Gliksman & Brook 1986);
- **alcohol outlet density** (Huckle et al. 2008; Livingston, Chikritzhs & Room 2007; Moskowitz 1989; Single 1988; Smith 1983; Stockwell & Gruenewald 2001; Zhu, Gorman & Horel 2004);
- **hours and days of sale** (Moskowitz 1989; Stockwell & Gruenewald 2001);
- **legal drinking age** (Moskowitz 1989; Smith 1983; Stockwell & Gruenewald 2001);
- **alcohol supply to young people** (Dent, Grube & Biglan 2005; Forster et al. 1995); and
- **access to alcohol in the home** (Komro et al. 2007).

Situational availability is also closely aligned with social drinking and other related indicators. The physical environment of licensed venues, social factors, staffing, and alcohol service all impact on the level of use and risk (Hughes et al. 2011). Also emphasised are the social composition and sociodemographic differences that influence consumption, as well as the normative role of alcohol in common social structures (Rabow et al. 1982).

In social circumstances, *situational availability* relates to risk and harms according to the:

- **sociability of drinkers** (Rabow et al. 1982);
- **social stratification of drinking outlets** (Gruenewald 2007);
- **surrounding of one's self with likeminded heavy drinkers** (Abbey, Scott & Smith 1993);
- **amount drinkers consume** (Abbey et al. 1990a, 1990b; Abbey, Scott & Smith 1993);
- **choice of drinking location and social contact with at risk populations** (Gruenewald 2007); and
- **sense of obligation to serve alcohol, drinking for social reasons, and friends' and co-workers' drinking** (Abbey et al. 1990a, 1990b).

Another form of *situational availability*, affordability, interacts with environmental and social indicators of risk according to:

- **the degree of economic availability**, as the price of an alcoholic drink in proportion to disposable income (Gruenewald, Millar & Treno 1993; Stockwell & Gruenewald 2001).

In Indigenous communities in Australia, reduced situational availability of alcohol is associated with a reduction in a number of health and social indicators. These settlements are usually a considerable distance from towns and cities, are populated primarily by Indigenous peoples, and experience a range of health and social issues. Following a number of restrictions on alcohol availability, a drop occurred in a number of indicators:

- **alcohol consumption, assaults and alcohol related injuries, hospital presentations, and the more public aspects of domestic violence** (Duncan 2011;

Kinnane et al. 2009; The Drug and Alcohol Office Western Australia & the University of Notre Dame Australia Broome Campus 2010).

Situational availability is an environmental, social and cost related factor associated with alcohol use. Situational factors are closely linked with the levels of consumption, risk and harms that occur in local circumstances and community settings. Situational availability is an important factor to inform alcohol policy and include in a public alcohol policy model. Results validate the influence of physical availability on alcohol consumption and harms at more local levels. The alcohol use environment is further clarified.

‘Availability’ is the variable of AT that best informs alcohol policy for populations.

Availability is the primary variable of the availability, consumption and harms relationship; consumption cannot occur unless alcohol is available to be accessed.

Availability is subject to government control and manipulation in the management of a legal substance such as alcohol. In addition to availability, the level of consumption as drinker demand is pivotal to harm at the population level. The significance of addressing consumption, together with alcohol availability, is confirmed by evidence from Europe and other western countries of focus (*Table Three*). A policy goal for Australia - to reduce actual alcohol availability - can provide a way to reduce consumption, risk and harms, not only at the population level but also in local environments and community settings. A related policy aim - to reduce annual per capita consumption by one litre of pure alcohol - would support the achievement of a reduction in harms. Confirmation of how alcohol availability can be controlled is provided by others (Babor et al. 2003; Babor et al. 2010; Loxley et al. 2004). Additional research investigates the relevance of *perceived availability* to consumption, risk, and harms from alcohol.

5.4 Stage Two: Analysis of the Role of Perceived Availability

Stage Two analyses the significance of *perceived availability* for alcohol outcomes and alcohol policy. Perceived availability, otherwise known as subjective availability, is well established in the literature as a significant factor in drinking occasions. Research in the 1990s (Abbey et al. 1990a, 1990b; Abbey, Scott & Smith 1993) added to the evidence available at that time. Findings determine the role of perceived availability in the purchase and consumption of alcohol and the amount drinkers consume (Abbey et al. 1990a, 1990b). Other investigations show perceived availability is as important as physical availability, in the form of distance prepared to travel to purchase alcohol, convenience of purchase, and price (Abbey, Scott & Smith 1993). The concept of perceived availability is closely aligned with alcohol expectancies, an evidenced concept associated with alcohol consumption (Leigh 1987; Leigh & Stacy 2004; Wall, Hinson & McKee 1998). Not only is the amount of alcohol available for consumption crucial to drinking choices, but evaluative judgments concerning alcohol also contribute to harms.

5.4.1 Selection of Studies for Analysis

To establish the extent to which perceived availability can inform drinking outcomes, a search of the literature was undertaken. The following data bases were searched for all years to identify research relevant to this stage of the thesis inquiry: AUSThealth, AUSTROM, CINHALL, Cochrane Collaboration, MEDLINE, PsycINFO, PubMed, and SocINDEX. Google Scholar was also utilised. Search terms used are: ‘access’, ‘alcohol’, ‘availability’, ‘convenience’, ‘distance’, ‘ease’, ‘obtaining’, ‘perceived’, ‘subjective’, ‘travel’, and ‘willingness’.

In all, twenty-one studies are identified with some relevance to the inquiry. Four investigations are excluded from the analysis for the following reasons: one study due to a

possible contamination of results from the conduct of another research intervention in the same locality at the same time (Rehnman, Larsson & Andreasson 2005); and three studies limited in relevance to the current analysis due to their, primarily, clinical and experimental design (Mackillop & Lisan 2005, 2007; Turkkan, McCaul & Stitzer 1989). The remaining seventeen studies, from a number of countries, are examined in detail.

Stage Two seeks to:

- investigate the associations between perceived availability/subjective availability and the prediction of alcohol related outcomes; and
- confirm the potential of perceived availability to inform public alcohol policy, alongside actual availability as a primary variable of AT.

An investigation of this kind has not previously been conducted in relation to perceived availability and its contribution to alcohol outcomes. Neither has the potential of perceived availability for alcohol policy been thoroughly investigated to date. More recently, the sociocultural aspects of alcohol have dominated the research agenda in Australia, alongside some attention on actual availability. In these contexts the analysis to follow represents an original contribution to the alcohol research field.

5.4.2 Results of Analysis (*Stage Two*)

Significant relationships between the ‘perceived/subjective availability’ (PA/SA) variable and an array of drinking circumstances and consumption behaviours are reported; data and research methods are described. Results are presented alphabetically by first author (*Table Four*).

Table 4: Significance of Perceived Availability/Subjective Availability in Alcohol Related Outcomes

Authors, Year and Data	Research Focus and Methods	Significant ‘PA/SA’ Relationships
Abbey, Scott, Oriansky, Quinn & Andreski, 1990 Part I & Part II Data Source: telephone survey of the 21 years to 65+ age group Data Adjusted For: physical availability, social availability	Subjective, social and physical availability: their interrelationships and simultaneous effects Research Methods: cross sectional correlations	Frequency of drinking; amount consumed; largest amount consumed Other significant associations: social availability indicators all variably relate to specific alcohol indicators (Physical distance from outlets not a significant factor)
Abbey, Scott & Smith, 1993 Data Source: telephone survey of the 21 + age group Data Adjusted For: physical availability, social availability	Physical, subjective and social availability: their relationships with alcohol consumption in rural and urban areas Research Methods: cross sectional correlations	Frequency of consumption; usual quantity consumed; heavy drinking Other significant associations: social availability indicators all relate in some way to specific alcohol indicators (Physical distance from outlets not significant)
Alstrom & Huntanen, 2007 Data Source: European School Survey on Alcohol and Other Drugs – alcohol use by students born in 1987 Data Adjusted For: minimum age purchase limit	The effects of perceived availability of different alcoholic beverages on young people’s drinking in Europe: a comparative exploration Research Methods: cross sectional scattergram analysis	Frequent purchase; frequent consumption; prevalence of drinking (No significant PA/SA relationship with prevalence of intoxication) Minimum purchase age has little effect
Ames & Grube, 1999 Data Source: survey interviews of selected workers in Michigan and ethnographic data from the workplace Data Adjusted For: physical availability, social factors	Alcohol availability and workplace drinking: mixed method analysis Research Methods: bivariate analysis, regression coefficients, ethnographic structural equation modelling	Subjective physical availability does not significantly relate to workplace drinking Other significant associations: subjective social availability of alcohol at work; perceived drinking by friends and co-workers Characteristics of work culture encourage and support alcohol availability and drinking behaviours
Branstrom, Sjoström & Andreasson, 2007 Data Source: self-report questionnaire based survey of grade	Individuals, groups and community risk and protective factors for alcohol and drug use among Swedish	Drinking risk in girls Other significant associations: individual, family, school and

nine and grade eleven adolescents Data Adjusted For: social factors, cannabis use	adolescents Research Methods: multivariate analysis, 99% confidence intervals	community risk factors; protective factors negatively relate to alcohol use (and drug use)
Epstein, Botvin, Baker & Diaz, 1999 Data Source: self-report survey of seventh grade students Data Adjusted For: gender, ethnicity, social factors including socioeconomic status, family and friends' drinking, tobacco and marijuana use, getting into trouble	Impact of social influences and problem behaviours on alcohol use among inner city Hispanic and black adolescents Research Methods: logistic regression, 95% confidence intervals	Current drinking; alcohol consumption per drinking occasion; prediction of future drinking Other significant associations: social influences of family and friends; smoking and marijuana use are associated with alcohol use across and within genders; getting into trouble predicts drinking for boys (No significant PA/SA influence on experimental alcohol use)
Epstein, Botvin & Diaz, 1999 Data Source: self-report survey of seventh grade students Data Adjusted For: gender, social factors including family and friends' drinking, tobacco and marijuana use, trouble in the past month	Etiology of alcohol use among Hispanic adolescents Research Methods: logistic regression, odds ratios, 95% confidence intervals	Experimental drinking: total sample and boys; consumption per drinking occasion; future drinking: total sample and boys Other significant associations: social influences and reported problem behaviours; friends', mothers' and siblings' drinking; cigarette and marijuana use
Jones-Webb, Toomey, Short, Murray, Wagenaar & Wolfson, 1997 Data Source: high school student self-report survey; self-report telephone survey of 18-20 year olds; observational assessments; and purchase attempts at licensed outlets Data Adjusted For: demographic, environmental, and other variables	Relationships among alcohol availability, drinking location, alcohol consumption, and drinking problems in adolescents Research Methods: mixed methods including odds ratios and bivariate analysis	Number of drinks on last occasion – males' higher consumption is associated with greater perceived ease in obtaining alcohol Other significant associations: for females, drinking in a public location such as bar or restaurant is marginally associated with higher levels of consumption (No significant PA/SA influence on drinking consequences)
Knibbe, Joosten, Derickx, Choquet, Morin, Monshouwer & Vollebergh, 2005 Data Source: Secondary School Survey 1997, 2000 Data Adjusted For: gender, age, school, alcohol availability, social factors, cannabis use, country specific effects	Perceived availability of substances, substance use and substance related problems: a cross national study among French and Dutch adolescents Research Methods: logistic regression analysis, odds ratios, 95% confidence intervals	Use of alcohol; more frequent use; likelihood of drinking five or more glasses of alcohol - 'binge' Other significant associations: problems with peers, socialising agents and adverse events; Dutch adolescents perceive alcohol to be more available than the French; the influence of perceived availability is stronger in the Netherlands

<p>Komro, Maldonado-Molina, Tobler Bonds & Muller, 2007</p> <p>Data Source: self-report surveys of students and parents from 32 schools</p> <p>Data Adjusted For: age, race, ethnicity, gender, family composition, parental discussion, family alcohol discussion, peer alcohol use, parental report of monitoring alcohol consumption</p>	<p>Effects of home access and availability of alcohol on young adolescents alcohol use</p> <p>Research Methods: longitudinal design, cross sectional analysis, odds ratios, confidence intervals</p>	<p>Past month alcohol use; past week alcohol use; drunkenness</p> <p>Other significant associations: age in relation to past year; past month use and drunkenness; friends who drink across all use factors</p> <p>(Race/ethnicity has very little influence)</p>
<p>Kunche, Kuendig & Gmel, 2008</p> <p>Data Source: European School Survey on Alcohol and Drugs 2003</p> <p>Data Adjusted For: gender, age, drinking peers, drinking siblings, drinking in public, poor parental modelling, 'on premise' and 'off premise' density</p>	<p>Alcohol outlet density, perceived availability and adolescent alcohol use: a multilevel structural equation model</p> <p>Research Methods: multilevel structural equation modelling</p>	<p>Drinking in public settings; poor parental modelling; 'on premise' density; drinking peers; drinking siblings; quantity & frequency; risky single occasion drinking</p> <p>(No significant PA/SA influence for 'off premise' density)</p>
<p>Lipperman-Kreda, Paschall & Grube, 2009</p> <p>Data Source: Oregon Healthy Teens Survey 2006</p> <p>Data Adjusted For: age, gender, race/ethnicity, perceived harm of alcohol use, personal disapproval of alcohol use, perceived police enforcement</p>	<p>Perceived local enforcement, personal beliefs, and underage drinking: assessment of moderating and main effects</p> <p>Research Methods: regression analysis, 95% confident intervals</p>	<p>Past 30 day alcohol use</p> <p>Other significant associations: perceived local enforcement; personal disapproval; perceived harm inversely relates to alcohol use; male/white relates to local enforcement issues</p>
<p>Moore, Ames & Cunradi, 2007</p> <p>Data Source: interview of naval personnel; mailed self-report survey of young enlisted naval personnel aged 18 to 29 years</p> <p>Data Adjusted For: age, social availability</p>	<p>Physical and social availability of alcohol for young enlisted naval personnel in and around home port</p> <p>Research Methods: qualitative analysis, ethnographic methods</p>	<p>63% of underage respondents and 81% of legal drinking age indicate it is easy to obtain alcohol in a work setting</p> <p>Other significant associations: social availability of alcohol</p>
<p>Paschall, Grube, Black & Ringwalt, 2007</p> <p>Data Source: self-report survey of grade eleven students; alcohol 'off license' purchase surveys; other relevant data</p> <p>Data Adjusted For: gender, race/ethnicity, commercial sources, social sources</p>	<p>Relationships between commercial alcohol availability, adolescent alcohol sources, and alcohol use</p> <p>Research Methods: odds ratios, 95% confidence intervals</p>	<p>Highest alcohol sales rate per school district; alcohol consumption in past 30 days; past 30 day heavy drinking</p> <p>Other significant associations: use of commercial sources and sales rate; use of commercial sources and male gender</p>

<p>Rabow, Schwartz, Stevens & Watts, 1982</p> <p>Data Source: private household interview involving over eighteen year olds</p> <p>Data Adjusted For: age, gender, marital status, education, income, social availability, price</p>	<p>Social psychological dimensions of alcohol availability: the relationships of perceived social obligations, price considerations, and energy expended to the frequency, amount, and type of alcoholic beverage consumed</p> <p>Research Methods: multistage probability design, weighted correlations and regression analysis</p>	<p>Drinking more; drinking more frequently</p> <p>Other significant associations: social availability/sociability most consistent influence; males and all alcohol beverages; income and wine</p> <p>(Importance of price in purchasing decisions has no significant effect)</p>
<p>Stanley, Henry & Swaim, 2011</p> <p>Data Source: student level data from a study of alcohol and drug use in 219 communities; student report surveys</p> <p>Data Adjusted For: gender, school grade, race/ethnicity, urban/rural/remote, physical availability, social availability</p>	<p>Physical, social and perceived availability of alcohol and last month use</p> <p>Research Methods: calculation of odds ratios</p>	<p>At individual as well as community levels, the ‘perceived availability’ variable is significant in predicting last month alcohol use</p> <p>Other significant associations: physical availability and last month alcohol use; social availability such as parents’ concern about drinking, peers’ drunkenness; chance of being caught by police, female and last month alcohol use</p> <p>(Physical availability not significantly associated with perceived availability)</p>
<p>Wagenaar, Toomey, Murray, Short, Wolfson & Jones-Webb, 1996</p> <p>Data Source: self-report survey of high school students; observational and alcohol purchase attempts at alcohol outlets; telephone survey of owner/manager of alcohol outlets; archival records of alcohol related arrests and injuries</p> <p>Data Adjusted For: demographic characteristics including age and gender, identity as ‘binge’ drinker, use of false ID, provide alcohol to others, older siblings, parents’ education, drinking norms</p>	<p>Sources of alcohol for underage drinkers and last 30 day use</p> <p>Research Methods: logistic regression and least squares analysis</p>	<p>Obtaining alcohol from persons 21 years and over most common; obtaining alcohol from persons less than 21 years; commercial availability</p> <p>Other significant associations: ‘binge’ drinking, demographic characteristics and sources of alcohol</p>

5.4.3 Discussion of Results (*Stage Two*)

These studies demonstrate the strength of the ‘perceived availability’ variable in a number of alcohol associated situations. Relationships in diverse circumstances like drinking location, the purchase of alcohol, frequency and level of consumption, drinking problems, outlet density, and sources of alcohol, are reported. The research reviewed is primarily conducted in the United States of America. Studies demonstrate associations between physical, subjective and social availability, and alcohol consumption (Abbey et al. 1990a, 1990b; Abbey, Scott & Smith 1993; Stanley, Henry & Swaim 2011). Some investigations are workplace related (Ames & Grube 1999; Moore, Ames & Cunradi 2007), or research the social influences on alcohol consumption for Hispanic adolescents (Epstein et al. 1999; Epstein, Botvin & Diaz 1999). Other American research investigates perceived availability in relation to drinking location (Jones-Webb et al. 1997), price and energy expended (Rabow et al. 1982), sources of availability (Komro et al. 2007; Paschall et al. 2007; Wagenaar et al. 1996), and local enforcement of underage drinking (Lipperman-Kreda, Paschall & Grube 2009). The remaining studies research perceived availability in European countries (Ahlstrom & Huntanen 2007); including Switzerland (Kuntsche, Kuendig & Gmel 2008); France and Holland (Knibbe et al. 2005); and Sweden (Branstrom, Sjostrom & Andreasson 2008). More than half the studies concerned adolescent drinking. There are no comparable Australian studies identified.

The research reviewed uses either the term ‘perceived availability’ or ‘subjective availability’ in survey design and explanation of data. In a number of studies, these terms are interchangeable in discussion. Some research investigates ‘convenience of purchase’, ‘willingness to go out to obtain alcohol’, or ‘willingness to travel to obtain alcohol’ (Abbey et al. 1990a, 1990b; Abbey, Scott & Smith 1993; Rabow et al. 1982). Other studies adopt the measure of ‘how available alcohol is thought to be from different

sources' (Wagenaar et al. 1996), or the 'perceived ease or difficulty of obtaining or purchasing alcohol' (Epstein et al. 1999; Epstein, Botvin & Diaz 1999; Jones-Webb et al. 1997; Knibbe et al. 2005; Komro et al. 2007; Kuntsche, Kuendig & Gmel 2008; Stanley, Henry & Swaim 2011). In addition, 'discomfort about buying alcohol' is used as a measure of 'subjective awareness', as is 'the importance of price' (Abbey et al. 1990a, 1990b). While survey questions differ between studies, these primarily relate to how available alcohol is thought to be, rather than the actual availability of alcohol.

Alcohol specific investigations adjust for demographic factors (Epstein et al. 1999; Epstein, Botvin & Diaz 1999; Jones-Webb et al. 1997; Knibbe et al. 2005; Kuntsche, Kuendig & Gmel 2008; Moore, Ames & Cunradi 2007; Paschall et al. 2007; Rabow et al. 1982; Stanley, Henry & Swaim 2011; Wagenaar et al. 1996); physical and/or social availability (Abbey et al. 1990a, 1990b; Abbey, Scott & Smith 1993; Ames & Grube 1999; Knibbe et al. 2005; Rabow et al. 1982; Stanley, Henry & Swaim 2011); social indicators such as family, friends' and peers' drinking (Branstrom, Sjostrom & Andreasson 2008; Epstein et al. 1999; Epstein, Botvin & Diaz 1999; Knibbe et al. 2005; Komro et al. 2007; Wagenaar et al. 1996); and parental influence (Komro et al. 2007; Kuntsche, Kuendig & Gmel 2008). All studies incorporate a self-report component; results indicate drinkers' awareness of alcohol availability and related behaviours.

Investigators adopt an array of research methods: questionnaire based multivariate analysis (Branstrom, Sjostrom & Andreasson 2008); analysis of telephone interview data to determine cross sectional correlations (Abbey et al. 1990a, 1990b; Abbey, Scott & Smith 1993); cross sectional self-report data using scattergram analysis (Ahlstrom & Huntanen 2007); regression analysis of self-report survey data (Lipperman-Kreda, Paschall & Grube 2009); estimation of 95% confidence intervals for self-report survey data (Epstein et al.

1999; Epstein, Botvin & Diaz 1999; Paschall et al. 2007); calculation of odds ratios for student data (Stanley, Henry & Swaim 2011); longitudinal design and cross sectional analysis of survey based data to estimate 95% confidence intervals (Komro et al. 2007); mixed methods including odd ratios and bivariate analysis of survey based data (Jones-Webb et al. 1997); logistic regression and least squares analysis of survey based data (Wagenaar et al. 1996); bivariate analysis, regression coefficients of interview data, and ethnographic structural equation modelling (Ames & Grube 1999); qualitative analysis of interviews (Moore, Ames & Cunradi 2007); cross national comparisons of secondary school survey data using logistic regression analysis (Knibbe et al. 2005); multilevel structural equation modelling of national survey data (Kuntsche, Kuendig & Gmel 2008); and multistage probability design using regression analysis and weighted correlations for home interview data (Rabow et al. 1982).

Sample size varies from 210 subjects interviewed by telephone (Abbey et al. 1990a, 1990b) to 83,454 students participating in a grade seven to grade nine alcohol and drug use survey (Stanley, Henry & Swaim 2011). Sample age range is from twelve to fourteen years (Epstein et al. 1999; Komro et al. 2007) to the sixty-five years plus age group (Abbey et al. 1990a, 1990b). Sample size and age range of subjects, and the variety of methods adopted in the studies, are strong indicators that perceived availability associations are consistent across a wide number of circumstances. The measures of perceived availability demonstrate significant effect in all but one of the investigations reviewed (Ames & Grube 1999). In this study, “findings from the bivariate analysis showed that subjective physical availability was uniformly seen to be high” (p. 391), but not significantly related to drinking at work or before work.

Measures of consumption are reasonably consistent across the studies; in particular, heavy or 'binge' drinking is mostly represented by 'five or more' consecutive alcoholic drinks (Abbey, Scott & Smith 1993; Branstrom, Sjostrom & Andreasson 2008; Jones-Webb et al. 1997; Knibbe et al. 2005; Komro et al. 2007; Kuntsche, Kuendig & Gmel 2008; Lipperman-Kreda, Paschall & Grube 2009; Paschall et al. 2007). The level of consistency of this measure makes results comparable between studies. Only one investigation diverges from this measure, with a 'ten drinks and above' definition for heavy drinking within a workplace context (Ames & Grube 1999). This measure is not a realistic estimate of risky drinking with 'five or more' consecutive drinks more in accordance with the advice of the Australian Alcohol Guidelines (National Health and Medical Research Council 2009). The 'ten drinks and above' measure used in the study (Ames & Grube 1999) could have impacted on the significance of perceived availability, a possibility not discussed by the authors.

Even so, the influence of perceived availability varies between investigations. Relationships range from 3% ($p < 0.05$) variance in 'how difficult it is to obtain alcohol' and having siblings who drink (Kuntsche, Kuendig & Gmel 2008); to 44% ($p < 0.01$) variance in 'willingness to go out of the way to purchase alcohol' and frequency of consumption and heavy drinking (Abbey, Scott & Smith 1993). Findings are similar to another investigation with satisfactory internal consistency for a number of perceived availability measures; further development of indicators is recommended (Klepp et al. 1996). Experimental drinking is not consistently influenced by perceived availability in studies involving adolescents from Hispanic and ethnic populations (Epstein et al. 1999; Epstein, Botvin & Diaz 1999). But, results are reflective of other investigations signifying connections between perceived availability and consumption related indicators (Knibbe et al. 2005; Komro et al. 2007; Kuntsche, Kuendig & Gmel 2008; Stanley, Henry & Swaim

2011). Yet, actual availability is not always significantly related to perceived availability (Abbey, Scott & Smith 1993).

Social availability, another indicator linked with perceived availability, demonstrates significant associations with a range of alcohol use variables (Abbey et al. 1990a, 1990b; Abbey, Scott & Smith 1993; Ames & Grube 1999; Moore, Ames & Cunradi 2007; Rabow et al. 1982). Important social influences originate from family, friends and peers (Branstrom, Sjostrom & Andreasson 2008; Epstein et al. 1999; Epstein, Botvin & Diaz 1999; Knibbe et al. 2005; Komro et al. 2007; Kuntsche, Kuendig & Gmel 2008). Social indicators related to alcohol have many common characteristics. Social availability and social influence form part of the concept of subjective norms, a primary variable of the TPB (Ajzen 1991; Ajzen & Madden 1986).

5.4.4 Significant Findings

Findings from the analysis are reported in the following categories: General Alcohol Consumption; Heavy Drinking, 'Binge' Drinking, Intoxication and Drunkenness; Gender Specific Risks; and Commercial Supply, Work Access and Home Access. Associations are demonstrated between consumption related factors and perceived availability indicators.

General Alcohol Consumption

- **amount consumed, largest amount consumed, frequency of drinking** and convenience of buying alcohol; discomfort about purchasing alcohol; willingness to go out of the way or travel to purchase alcohol; willingness to purchase alcohol without prior plans; and frequency of going out just to buy alcohol (Abbey et al. 1990a, 1990b);

- **frequency of drinking** and the considered importance of price (Abbey, Scott & Smith 1993);
- **frequent purchase of wine and spirits, prevalence of drinking** and good perceived availability (Ahlstrom & Huntanen 2007);
- **alcohol use and more frequent use, problems with peers, social contacts, adverse events** and perceived ease or difficulty in obtaining alcohol (Knibbe et al. 2005);
- **alcohol use over the past thirty days** and perceived availability (Lipperman-Kreda, Paschall & Grube 2009; Paschall et al. 2007); and
- **past month alcohol use** and perceived ease of obtaining alcohol (Komro et al. 2007; Stanley, Henry & Swaim 2011).

Heavy Drinking, 'Binge' Drinking, Intoxication and Drunkenness

- **heavy drinking** and willingness to go out of the way to obtain alcohol (Abbey, Scott & Smith 1993);
- **heavy drinking, drinking frequency** and willingness to travel to purchase alcohol within the context of distance from an alcohol outlet (Rabow et al. 1982);
- **risk of intoxication in girls** and perception of alcohol availability (Branstrom, Sjostrom & Andreasson 2008);
- **higher consumption, 'binge' drinking** and ease of obtaining alcohol (Jones-Webb et al. 1997);
- **increased likelihood of 'binge' drinking** and ease of obtaining alcohol (Knibbe et al. 2005);
- **prevalence of drunkenness** and ease or difficulty in obtaining alcohol at home (Komro et al. 2007); and

- **heavy drinking** and ease of obtaining alcohol (Paschall et al. 2007).

Gender Specific Risks

- **risk of intoxication in girls** and perceived availability in the community (Branstrom, Sjostrom & Andreasson 2008);
- **higher consumption among males** and perception of ease of obtaining alcohol (Jones-Webb et al. 1997); and
- **experimental drinking, amount consumed per occasion, future drinking** and perceived ease of obtaining alcohol, with specific effects for girls and boys (Epstein et al. 1999; Epstein, Botvin & Diaz 1999).

Commercial Supply, Work Access and Home Access

- **sources of alcohol use: obtaining alcohol commercially, from persons twenty-one years and over, under twenty-one years** and perceptions of commercial availability (Wagenaar et al. 1996);
- **district commercial sales, past thirty-day drinking, heavy drinking** and ease of obtaining alcohol (Paschall et al. 2007);
- **drinking in public settings, going out without parental knowledge, poor parental modelling, ‘on premise’ density, drinking siblings and peers** and difficulty in obtaining alcohol (Kuntsche, Kuendig & Gmel 2008);
- **student past month use** and difficulty in obtaining alcohol from parents or home supply (Komro et al. 2007); and
- **after work drinking** and perceived ease of obtaining alcohol at a naval base (Moore, Ames & Cunradi 2007).

Findings confirm that perceived availability, an important variable in the environmental context of alcohol use, is significant in a number of alcohol related situations and settings. This knowledge is useful to inform public alcohol policy and a public alcohol policy model for Australia. Perceived availability accounts for variation in sources of alcohol, drinker demand, alcohol purchase, consumption levels and use behaviours, all of relevance to alcohol policy. Where alcohol is perceived as easy to obtain, a higher prevalence of alcohol related harms is evident. Social availability and other social factors also exert an effect. Analysis confirms ‘perceived availability’ and ‘subjective availability’ are mostly interchangeable concepts, influencing risk and harms in significant ways. It is these findings that reveal the importance of perceived availability to alcohol outcomes and alcohol policy.

5.4.5 Discussion of Policy Relevance

General Alcohol Use: Public alcohol policy can aim to modify the perceived availability of drinkers and the wider general public in order to reduce overall alcohol use. Perceived availability factors requiring policy attention include: the convenience of purchase; willingness to go out of the way or travel to obtain alcohol; willingness to purchase alcohol without prior plans; the frequency of going out just to buy alcohol; the overall discomfort about buying alcohol; and the importance of price (Abbey et al. 1990a, 1990b; Abbey, Scott & Smith 1993). The difficulty of obtaining alcohol (Knibbe et al. 2005; Komro et al. 2007; Lipperman-Kreda, Paschall & Grube 2009) needs to be increased through alcohol policy and regulatory control measures. These recommendations are consistent with findings that good perceived availability of alcohol results in an increase in the probability of wine and spirits purchase (Ahlstrom & Huntanen 2007). Associations are evident between past month’s use, perceived availability and future drinking (Komro et al. 2007; Stanley, Henry & Swaim 2011). Social availability (Abbey et al. 1990a, 1990b; Abbey,

Scott & Smith 1993; Ames & Grube 1999; Moore, Ames & Cunradi 2007; Rabow et al. 1982) and social influence from family, friends and peers (Branstrom, Sjostrom & Andreasson 2008; Epstein et al. 1999; Epstein, Botvin & Diaz 1999; Knibbe et al. 2005; Komro et al. 2007; Kuntsche, Kuendig & Gmel 2008) are also important and can be considered for alcohol policy.

Heavy Drinking, 'Binge' Drinking, Intoxication and Drunkenness: To reduce the incidence of heavy drinking, 'binge' drinking, intoxication and drunkenness, public alcohol policy can aim to decrease the value of these risky behaviours and increase the perceived difficulty of obtaining alcohol. Increasing the difficulty of obtaining alcohol is a significant policy lever to reduce harmful consumption (Jones-Webb et al. 1997; Knibbe et al. 2005; Komro et al. 2007; Paschall et al. 2007). In order to reduce high risk drinking, policy measures can aim to alter drinkers' willingness to travel to purchase alcohol (Rabow et al. 1982), or go out of their way to obtain alcohol (Abbey, Scott & Smith 1993). Social availability is also important (Abbey, Scott & Smith 1993), as are problems with peers (Knibbe et al. 2005), and having friends and siblings who drink (Komro et al. 2007; Kuntsche, Kuendig & Gmel 2008). Ways of including this knowledge in public alcohol policy requires further development.

Gender Specific Risks: Intoxication in girls can be addressed through policy that reduces the perceived availability of alcohol in the community (Branstrom, Sjostrom & Andreasson 2008). Even so, a reduction in perceived availability of alcohol, through reducing the perception of alcohol as easy to obtain, will also reduce the risk of higher consumption for males. According to other research, there are separate effects for boys and girls (Epstein et al. 1999; Epstein, Botvin & Diaz 1999); these are not sufficient to warrant gender specific intervention.

Commercial Supply, Work Access and Home Access: Alcohol policy can aim to modify the perception of easy access to alcohol in order to reduce drinking at home, at work and in public settings. As perceived commercial availability increases, the use of other sources of alcohol decreases for those young people transforming from underage to a legal drinking age (Wagenaar et al. 1996). The perceived ease of obtaining alcohol in commercial settings is certainly a significant factor in past thirty-day drinking and heavy drinking of adolescents (Paschall et al. 2007). But this finding suggests commercial availability does not directly influence underage drinking; effects occur indirectly through perceptions of availability (Paschall et al. 2007). Increasing the difficulty of obtaining alcohol is certainly relevant to young people's drinking in public settings, as is the impact of 'on premise' density and the influence of parents, siblings and peers (Kuntsche, Kuendig & Gmel 2008). Parental actions to reduce availability in the home will help reduce perceived availability for young people (Komro et al. 2007). Findings are consistent with those of another study into alcohol specific parenting. While not specifically inquiring about the ease of access to alcohol in the home, research indicates perceived alcohol availability, as 'permission to drink at home', is the only parental factor predicting an increase in alcohol intake and related problems (van den Eijnden et al. 2011). The role that parents play in liberal alcohol access for adolescents requires active policy attention. Perception of local enforcement of underage drinking laws also influences the alcohol use of younger age groups (Lipperman-Kreda, Paschall & Grube 2009).

Adolescent Alcohol Use and Harms: More than half of the perceived availability research reviewed above relates to adolescent alcohol use and harms. To reduce current drinking and alcohol consumption, as well as predict future drinking of adolescents, alcohol policy can aim to increase the difficulty of acquiring alcohol and modify the perception of alcohol as easy to obtain. Other results indicate that both perceived and actual availability of

alcohol influence the level of adolescent alcohol use (Stanley, Henry & Swaim 2011). Efforts to target multiple risk and protective factors in alcohol and drug preventive interventions are especially crucial for adolescents (Branstrom, Sjostrom & Andreasson 2008). Prevention programs aimed at adolescents need to consider social influences and perceived peer norms (Hughes 2008; Hughes et al. 2008; Komro et al. 2007), involve parents (van den Eijnden et al. 2011), and address an array of problem drinking behaviours (Epstein et al. 1999; Epstein, Botvin & Diaz 1999). Policy to reduce alcohol risk in adolescents, and in particular for girls (Branstrom, Sjostrom & Andreasson 2008), can aim to modify perceived availability. These recommendations extend to adult drinkers, but price has no significant effect on those over eighteen years (Rabow et al. 1982).

Nonetheless, the trends observed in the studies discussed above with regards to perceived availability are not consistently observed in workplace drinking. Ames and Grube (1999) reveal subjective availability is not significantly related to workplace drinking, but it cannot be assumed that easy access has no effect. These findings lend support to the importance of the drinking of others as social norms (Hughes et al. 2008) and the predominant drinking culture in workplaces. Workplace policies need to address the environmental context of alcohol use at work, in order to modify the subjective availability of alcohol. Another work related investigation of naval personnel shows variable effects between underage drinkers and those of legal drinking age regarding the perceived ease of obtaining alcohol 'on base' after work, and 'off base' after work (Moore, Ames & Cunradi 2007). In this study, underage drinkers generally thought alcohol was more difficult to obtain than those of legal drinking age; a high proportion of both groups indicate they could access alcohol from friends inside and outside of the navy, revealing the importance of perceived social availability. These work related findings suggest availability control measures, together with community based interventions, influence workplace drinking and

reduce perceptions of alcohol as readily available and easy to access (Moore, Ames & Cunradi 2007).

Researchers further endorse the importance of perceived availability to alcohol outcomes and alcohol policy. Some authors contend that subjective availability varies much more than physical availability due to individual differences in valuing distance, convenience and price (Abbey et al. 1990a, 1990b). Also emphasised are interactions between perceived availability and alcohol consumption, as well as the importance of environmental factors to perceptions and related beliefs. “In many areas with liberal alcohol availability laws, physical availability may be too modest to influence alcohol consumption perceptions of availability influence consumption, which in turn, affects perceptions of availability results have both prevention and treatment implications” (Abbey, Scott & Smith 1993, p. 497).

Also recommended by researchers is the elimination of alcohol advertising and billboards, fewer liquor stores, and the development of community consensus against alcohol (Epstein et al. 1999). The importance of prevention programs is likewise emphasised (Ames & Grube 1999; Epstein, Botvin & Diaz 1999). Investigators discuss the links between perceived and actual availability (Stanley, Henry & Swaim 2011); others emphasise the importance of alcohol control policies in reducing perceived availability, access, and drinking problems in adolescence (Jones-Webb et al. 1997). Effective measures such as “laws and law enforcement that address commercial purchasing and also interventions in private settings” are strongly endorsed (Kuntsche, Kuendig & Gmel 2008, p. 815).

Informal social controls are also highlighted in relation to perceived social influences (Knibbe et al. 2005). Findings are consistent with the success of alcohol control strategies in a number of countries, as previously discussed.

In the Australian context, perceived availability is crucial to alcohol control measures for Indigenous communities. Following alcohol restrictions in a Western Australian Indigenous community, the relevance of the perceived distance that drinkers were prepared to travel to purchase alcohol was examined. Some locals believed many residents had left the community to have greater access to alcohol (The University of Notre Dame Australia Broome Campus 2010). Others thought very few had moved to locations where alcohol was easy to obtain. The overall importance of the perceived distance drinkers are prepared to travel to purchase alcohol is, however, confirmed by other research (Abbey et al. 1990a, 1990b; Abbey, Scott & Smith 1993; Rabow et al. 1982), alongside a number of other perceived availability indicators covered in *Stage Two*.

5.5 Summary of Findings (*Stage One* and *Stage Two*)

The general availability of alcohol is fundamental to aggregate consumption, as well as to risk and harms from alcohol. These findings confirm an evidenced direction for public alcohol policy. The population level availability of alcohol alters the prevalence of alcohol related harms via population consumption, according to AT (Bruun et al. 1975). A goal to reduce aggregate consumption, alongside a reduction in actual availability, will strengthen the frame of public alcohol policy in Australia. Taking these associations into account, harms can be prevented through controlling availability and reducing demand for alcohol at the population level.

The categories of harm able to be addressed through reduced availability and consumption are: all-cause mortality (Norstrom & Ramstedt 2005), including accidents (Skog 2001a, 2001b), homicide (Rossow 2001), and suicide (Ramstedt 2001a, 2005). In the longer term, conditions such as liver cirrhosis (Ramstedt 2001b) and other chronic alcohol related diseases are expected to be less prevalent (Norstrom & Ramstedt 2005). Thus, an aim to

lower Australia's annual per capita consumption by one litre of pure alcohol is consistent with findings from other countries (Norstrom 2006; Norstrom & Ramstedt 2005; Ramstedt 2001a, 2001b; Skog 2001a, 2001b).

But a policy emphasis on reducing aggregate consumption per se, in order to reduce alcohol related problems, is a fairly meaningless exercise, as "per capita alcohol consumption is the most average of average measures" (Stockwell et al. 1997, p. 2). Moreover, unintended outcomes can stem from extreme limitations on population availability; the consequences of strong restrictions are not always in the best public health interest (Stockwell & Gruenewald 2001). While general alcohol availability can be controlled through legislation, taxation and excise measures (Babor et al. 2003; Loxley et al. 2004), higher taxation and stronger pricing control could see drinkers shift their preference to another alcoholic beverage or drinking venue with perceived greater value for money. Within population based data, the impact of alcohol availability on groups and individuals can sometimes be masked.

Links between availability, consumption, risk and harms from alcohol are sustained in situational environments and local settings. The situational relationships between availability and consumption are crucial to a reduction in risk and harms for the most vulnerable of drinkers and for local communities. It is within local situations that drinkers are able to access alcohol, and within local circumstances that universal and targeted approaches exert a combined effect. According to research, safer drinking choices can be achieved through: reducing outlet density (Huckle et al. 2008; Livingston, Chikritzhs & Room 2007; Moskowitz 1989; Single 1988; Smith 1983; Zhu, Gorman & Horel 2004); reducing hours and days of sale (Stockwell & Gruenewald 2001); and increasing legal purchase age (Moskowitz 1989; Smith 1983); thereby reducing perceptions of availability.

Additionally, strong restrictions are successful in some Indigenous communities (Duncan 2011; Kinnane et al. 2009; Nicholas 2007). In these ways, policy effort is directed towards reducing risk for those most affected (Stockwell et al. 1997).

Perceived availability is related to an array of alcohol outcomes and alcohol policy agendas. Perceived availability is closely aligned with alcohol supply (Komro et al. 2007; Kuntsche, Kuendig & Gmel 2008; Paschall et al. 2007; Wagenaar et al. 1996), purchase (Abbey et al. 1990a, 1990b; Abbey, Scott & Smith 1993; Ahlstrom & Huntanen 2007); and consumption (Branstrom, Sjostrom & Andreasson 2008; Epstein et al. 1999; Epstein, Botvin & Diaz 1999; Jones-Webb et al. 1997; Knibbe et al. 2005; Lipperman-Kreda, Paschall & Grube 2009; Rabow et al. 1982; Stanley, Henry & Swaim 2011). As demonstrated, perceived availability is an important factor in explaining different patterns of use such as frequency of consumption, amount consumed on each drinking occasion, intoxicated drinking, and future drinking. Management of public perceptions of alcohol availability is a policy imperative to reduce population risk and harms. Perceptions of social availability and social influence are also relevant to safer drinking environments (Abbey et al. 1990a, 1990b; Abbey, Scott & Smith 1993; Rabow et al. 1982).

Variation in alcohol harms between population groups and particular localities can be explained by perceived availability. These associations further confirm the significance of a number of availability factors in risk and harms from alcohol. It is clear that perceived availability can be afforded a focus in future public alcohol policy for Australia, at the population level alongside universal indicators like actual availability and in strategies aimed at vulnerable drinkers and risky drinking circumstances. A focus on perceived availability could inform successful policy outcomes for local environments and community settings. Taking these findings into account, actual availability and perceived

availability are likely mutually reinforcing and strongly influence supply and demand for alcohol.

5.6 Implications for an Alcohol Policy Model

Important knowledge is gained regarding how a public alcohol policy model can be framed. Perceived availability adds to the impact of actual availability on drinking decisions and consequences, and should be considered as a strong public policy lever in the prevention of risk and harms. Social availability and social connections are associated with perceived availability. Reducing the perceived availability of alcohol in drinking related circumstances and specific alcohol setting can act as a strong protective factor in the development of risk and harms. As well as having practical application, perceived availability, as a subjective measure, is important in a theoretical context.

At a conceptual level, incorporation of ‘perceived availability’ alongside ‘actual availability’ in AT (Bruun et al. 1975) would strengthen understanding of the population relationships between availability, consumption and harms. Although not central to AT, situational access to alcohol is an important component of the universal relationships between availability, consumption and harms, able to be exploited within a public policy context. Inclusion of ‘perceived availability’ in the claims of a reconceptualised AT (Bruun et al. 1975) would more effectively account for alcohol risk at both population and subpopulation levels. A revised version of AT could provide a level of protection for populations and communities if the theory was applied to alcohol problems and their policy solutions.

The benefits to be realised in acknowledging *actual alcohol availability* and *perceived alcohol availability* for alcohol policy include: a wider scope of interventions able to be applied at population and subpopulation levels; and a contribution to the development of a

public alcohol policy model. Evidence for an alcohol policy model is further pursued in the next chapter through investigation of the attributes of alcohol consumption behaviours. Moreover, the characteristics of consumers are closely related to the distribution of consumption across populations (Rabow et al. 1982); these require attention in policy and intervention. Analysis of the Theory of Planned Behaviour (Ajzen 1991; Ajzen & Madden 1986), as another possible means to improve alcohol policy, will next be pursued to complement the population gains to be realised in applying Availability Theory to a public alcohol policy model.

Chapter 6: Investigating the Theory of Planned Behaviour for Alcohol Policy

6.1 Introduction: Using the Theory of Planned Behaviour for Public Alcohol Policy

Chapter Four confirmed the policy potential of Availability Theory (AT) and the Theory of Planned Behaviour (TPB); *Chapter Five* verified that AT can inform public alcohol policy and a public alcohol policy model. The TPB's relevance to public alcohol policy and a public alcohol policy model is sought in this chapter. Whether a key variable of the TPB is significant enough to be used on its own in alcohol policy is kept to the fore. According to the TPB, the primary variables of 'attitude', 'subjective norm' and 'perceived behavioural control' influence 'intention', which in turn impacts on the achievement of behaviour (Ajzen 1991; Ajzen & Madden 1986). Corresponding with the claims of the TPB, these influences are not necessarily causal, but are predictive and explanatory in function. Two versions of the TPB are apparent: one where 'perceived behavioural control' influences behaviour indirectly through 'intention', and the other where 'perceived behavioural control' directly impacts on behaviour.

Alcohol consumption occurs in a diversity of ways for varying incentives that meet changing needs over time. The attributes of consumption behaviours are important predictors of alcohol use and alcohol outcomes. Within the context of the TPB (Ajzen 1991; Ajzen & Madden 1986), drinking is viewed as behaviour not entirely volitional; a position verified by the wider alcohol literature (American Psychiatric Association 2000; Heather 1995). Perceived behavioural control is the only variable of the theory that bypasses intention and influences behaviour directly. In addition, perceived behavioural control is conceptualised in the theory as more important than actual control, able to act as

a proxy for real control. The TPB implies, in some circumstances, control and perceived behavioural control are interchangeable as predictors.

An important strength of the TPB is the potential to inform policy for vulnerable drinkers, especially those most at risk of diminished control. Consideration of the characteristics of at risk drinkers is consistent with accommodation of the preferences and requirements of those specifically targeted (Marlatt & Witkiewitz 2002). In these contexts, the TPB literature is synthesised for alcohol policy application. Scrutiny of the key variables of the TPB helps broaden an understanding of the proximate and salient influences on intentions and behaviours, including those that are alcohol related. This investigation builds on the research of the previous chapter verifying the importance of AT to public alcohol policy and a public alcohol policy model.

6.2 Stage One: Analysis of the Theory of Planned Behaviour for Alcohol Outcomes and Alcohol Policy

6.2.1 Selection of Studies for Analysis

Stage One investigates the relevance of the TPB in predicting drinking behaviours and informing alcohol policy. The following data bases were searched for all years to identify literature relevant the inquiry: AUSThealth, AUSTROM, CINHAL, Cochrane Collaboration, MEDLINE, PsycINFO, PubMed, and SocINDEX. Google Scholar was also utilised. Search terms used are: ‘alcohol’, ‘attitudes’, ‘behaviour’, ‘behavioural’, ‘consumption’, ‘control’, ‘intention’, ‘intervention’, ‘perception’, ‘perceived behavioural control’, ‘social norms’, ‘subjective’, ‘theory’, and ‘Theory of Planned Behaviour’.

Twenty-three studies of interest to alcohol consumption and alcohol policy are identified.

Nine investigations are excluded overall. This step is taken to ensure the efficacy of the theory in original form is tested in the thesis. Excluded are two reviews extending the TPB

beyond its initial conceptualisation (Conner & Armitage 1998; Manstead & Parker 1995); and two alcohol related investigations revising or expanding the theory (Armitage et al. 1999; Kuther 2002). Two studies that apply the TPB to samples where the majority of drinkers had no control issues (Glassman et al. 2008; O'Callaghan et al. 1997) are likewise proscribed. Results of the latter research do not add to an understanding of the comparative strength of the TPB variables, particularly perceived behavioural control, and indicate drinking was largely controllable for the subjects in question. Use of a Theory of Reasoned Action (TRA) framework (Fishbein & Ajzen 1975), without the 'perceived behavioural control' variable, would have delivered similar research results.

Another three TPB investigations are not included. A study of the prediction of abstinence intentions and alcohol expectations conducted in a residential rehabilitation centre is not analysed (Morojele & Stephenson 1994). This research is considered too biased to inform an array of alcohol use behaviours and broad public alcohol policy. The study relies on a sample drawn from a treatment setting; these individuals are likely dependent on alcohol. Other studies excluded are an outcome evaluation of a drink driving education program (Sheehan et al. 1996) and a belief based investigation of 'binge' drinking in female university students (Johnston & White 2004). These latter investigations do not report on the comparative strength of the primary variables of focus, so lack the specificity necessary to enlighten the current investigation.

In all, fourteen studies are analysed in *Stage One (Table Five)*. Two reviews of research into general behaviours are vital to the task at hand (Armitage & Conner 2001; Godin & Kok 1996). Eleven alcohol specific investigations originate from a number of countries: the United Kingdom (Conner et al. 1999; Jamison & Myers 2008; McMillan & Conner 2003; Murgraff, McDermott & Walsh 2001; Norman, Armitage & Quigley 2007; Parker et

al. 1992), including Wales (Norman, Bennett & Lewis 1998); in addition, Canada (Schlegel et al. 1992); and the United States of America (Higgins & Marcum 2005; Marcoux & Shope 1997). Only one study included in the analysis is an Australian investigation (Johnston & White 2003). Also analysed is a systematic review of twenty-four TPB based change interventions (Hardeman et al. 2002).

Stage One seeks to:

- establish the efficacy of the TPB to predict drinking intentions and alcohol related behaviours; and
- substantiate the relevance of the TPB to inform public alcohol policy.

The following are also discussed:

- significant findings of the investigation; and
- the relevance of the TPB to inform a public alcohol policy model.

This type of investigation has not previously been undertaken specifically in relation to alcohol use and a TPB framework. Nor has the potential contribution of the TPB to public alcohol policy been thoroughly investigated to date. In these ways the analysis to follow represents an original contribution to the alcohol research field.

6.2.2 Results of Analysis (*Stage One*)

The present analysis categorises fourteen selected studies under the headings of: *General Behavioural Studies* (N=2); *Studies of Alcohol Specific Behaviours* (N=11); and *Behavioural Change Interventions* (N=1). For each category, research is presented in alphabetical order by first author. Alcohol related studies, previously examined as part of the Armitage and Conner (Armitage & Conner 2001) and Godin and Kok reviews (Godin

& Kok 1996), are identified by the specific markers of ‘ + ’ and ‘ # ’ respectively.

Associations between the TPB and general behaviours are reported, together with significant relationships for alcohol specific behaviours. Data and research methods are described, as well as the relevance of the TPB to behaviour change interventions (*Table Five*).

Table 5: Relevance of the Theory of Planned Behaviour to Predicting Behaviours and Behavioural Change Interventions

General Behavioural Studies (N=2)		
Authors, Year and Data	Research Focus and Methods	Significant TPB Relationships
Armitage & Conner, 2001 Data Source: 187 independent studies of general and health specific behaviours published up to 1997	Analytic review to test the overall efficiency of the TPB to predict behaviours, including those that are health related Research Methods: literature review and analysis	39% variance in intention and 27% variance in behaviour - the <i>subjective norms</i> construct is generally a weak predictor of intentions Note: reported results are not alcohol specific
+ Godin & Kok, 1996 Data Source: review of relevant studies published between 1985 and 1996 reporting on the prediction of health related behaviours	Review of the application of the TPB in the health domain to verify its efficiency in explaining and predicting health related behaviours Research Methods: literature review and analysis	41% variance in intention and 34% variance in behaviour - <i>perceived behavioural control</i> independently predicts intentions and behaviours Note: reported results are not alcohol specific
Studies of Alcohol Specific Behaviours (N=11)		
Authors, Year and Data	Research Focus and Methods	Significant TPB Relationships
Conner, Warren, Close & Sparks, 1999 Data Source: self-report questionnaire Data Adjusted For: self-identity, past behaviour, gender, age	United Kingdom examination of the TPB and alcohol consumption with examination of the cognitive mediation of past behaviour Research Methods: prospective design, intercorrelations, regression analysis	28% to 40% variance in intention and 12% to 50% variance in behaviour Other significant associations: past behaviour; self-identity as a drinker
Higgins & Marcum, 2005 Data Source: self-report survey Data Adjusted For: low self-control	American study of the ability of TPB to mediate the effects of low self-control on intentions to use, and alcohol consumption Research Methods: prospective design, bivariate correlations	24% variance in intention and 17% variance in behaviour Other significant associations: low self-control
Jamison & Myers, 2008 Data Source: self-report questionnaire Data Adjusted For: gender, status, frequency of drinking, friends' drinking, peer and social influence	United Kingdom examination of TPB as a framework for explaining 'binge' drinking among young adults Research Methods: cross sectional design, intercorrelations, hierarchical regression	7% variance in intention Other significant associations: frequency of drinking; friends' drinking

Johnston & White, 2003 Data Source: self-report survey Data Adjusted For: group norms, group identification	Australian investigation to assess the utility of the TPB to predict students' 'binge' drinking Research Methods: longitudinal design, descriptive analysis, multiple regression, hierarchical regression	69% variance in intention and some variance in behaviour Other significant associations: group norms; group norms in relation to group identification
+ Marcoux & Shope, 1997 Data Source: self-report questionnaire Data Adjusted For: alcohol availability	American study of TPB/TRA and alcohol use, frequency of alcohol use, and misuse of alcohol Research Methods: longitudinal design, regression analysis	76% variance in intention and 26% to 38% variance in alcohol related behaviours explained by intention Other significant associations: availability
McMillan & Conner, 2003 Data Source: self-report questionnaire Data Adjusted For: moral norms, descriptive norms	United Kingdom study of TPB, intentions to use and self-reported use of alcohol (and tobacco) Research Methods: correlations, regression analysis	16.7% variance in intention and 28.9% variance in behaviour Other significant associations: descriptive norms Note: Tobacco results not reported here
Murgraff, McDermott & Walsh, 2001 Data Source: self-report questionnaire Data Adjusted For: age, marital status, beliefs	United Kingdom exploration of the correlates of adhering to low risk single occasion drinking guidelines in female undergraduate psychology students Research Methods: Cronbach's alpha coefficients, zero order correlations, hierarchical regression	17% variance in behaviour Other significant associations: indirect measures of TPB - behavioural and normative beliefs, and age
Norman, Armitage & Quigley, 2007 Data Source: self-report questionnaire Data Adjusted For: 'binge' drinker prototype identification	United Kingdom study assessing the value of prototype perceptions within the TPB when predicting young people's 'binge' drinking intentions and behaviour Research Methods: intercorrelations, hierarchical regression, simple regression slopes	58% variance in intention and 22% variance in behaviour Other significant associations: prototype similarity
Norman, Bennett & Lewis, 1998 Data Source: self-report questionnaire Data Adjusted For: gender, beliefs	Welsh study using the TPB as a theoretical framework to explore the motivational and attitudinal factors underlying 'binge' drinking of undergraduate students Research Methods: correlations, regression analysis	29% variance in behaviour Other significant associations: indirect measure of TPB – control beliefs

<p>+ # Parker, Manstead, Stradling, Reason & Baxter, 1992</p> <p>Data Source: self-report questionnaire</p> <p>Data Adjusted For: age, gender, accident rate, passenger time</p>	<p>United Kingdom research assessing the ability of the TPB to account for drivers' intentions to commit driving violations (including drinking and driving)</p> <p>Research Methods: zero order correlations, hierarchical regression</p>	<p>42.3% variance in intention</p> <p>Other significant associations: age</p> <p>Note: Drinking and driving is the only component of the study reported here</p>
<p>+ # Schlegel, D'Avernas, Zanna, DeCourville & Manske, 1992</p> <p>Data Source: self-report questionnaire</p>	<p>Canadian examination of the ability of the TPB to predict intention and behaviour (over and above the TRA) with regards to problem drinking and getting drunk</p> <p>Research Methods: longitudinal design, regression analysis</p>	<p>TPB more effective in predicting intention and behaviour than TRA</p> <p>Other significant associations: not reported</p> <p>Note: Results specific to the TRA not reported here</p>
Behavioural Change Interventions (N=1)		
Authors, Year and Data	Research Focus and Methods	Significant TPB Relationships
<p>Hardeman, Johnston, Johnston, Bonetti, Wareham & Kinmonth, 2002</p> <p>Data Source: previously published studies applying the TPB to behaviour change interventions</p>	<p>United Kingdom review of studies explicitly applying the TPB to behaviour change interventions</p> <p>Research Methods: literature review and analysis</p>	<p>Half the interventions are effective in changing intention and two thirds are effective in changing behaviour</p>

6.2.3 Discussion of Results (*Stage One*)

These studies demonstrate the relevance of the TPB to alcohol use and consumption behaviours. The investigations are heterogeneous; they examine diverse aspects of alcohol use across different populations, in a variety of situations, using a range of research methodologies. Within these contexts, the TPB is an effective predictor of alcohol related intentions and behaviours, able to clarify the attributes of consumption. The timeframes of the studies vary, as do the number of stages of the research. Armitage and Connor (2001) analyse one hundred and sixty-one journal articles containing one hundred and eighty-five independent empirical tests of the TPB. Nineteen investigations use prospective measures of behaviour; forty-four studies use self-report prospective behaviour measures. Alongside the analysis of the primary variables of the TPB - attitude, social norm, and perceived behavioural control - the indirect effects of behavioural, normative and control beliefs are accounted for (Armitage & Conner 2001). The Godin and Kok review examines fifty-six studies covering fifty-eight behavioural applications (Godin & Kok 1996). Attitudes, social norms, and perceived behavioural control are the primary focus of their investigation.

Findings of individual studies are reported as variance, or the extent of change attributable to the TPB variables. All alcohol studies incorporate a self-report component in their design, so results are indicative of drinkers' perspectives on alcohol use and related behaviours. The Higgins and Marcum study (2005) includes a measure of low self-control within a TPB context; this variable is significant to the exploration of the theory for alcohol outcomes and alcohol policy. As discussed previously, loss of control is an important factor in intention to drink and actual drinking, as well as the experience of alcohol related harms (Conner et al. 1999; Heather 1995).

Subjects included in the studies vary in demographic and other characteristics so are representative of a wide number of alcohol related situations and behaviours. Recruited subjects are from school and college student populations, undergraduate and postgraduate university populations, communities, and the general public. According to these distinctions, the TPB is a useful predictor of drinking behaviours across the lifespan. Six studies have a sample size of greater than two hundred participants (Higgins & Marcum 2005; Johnston & White 2003; Marcoux & Shope 1997; Murgraff, McDermott & Walsh 2001; Parker et al. 1992; Schlegel et al. 1992). Only one study records a sample size of less than one hundred (N=94); at one week follow up seventy-nine participants remained (Norman, Armitage & Quigley 2007).

Alcohol related investigations adjust for factors other than the primary TPB variables: demographic factors (Conner et al. 1999; Jamison & Myers 2008; Murgraff, McDermott & Walsh 2001; Norman, Bennett & Lewis 1998; Parker et al. 1992); social factors such as social norms and identification, family, friends' and peers' drinking (Jamison & Myers 2008; Johnston & White 2003; McMillan & Conner 2003); self-identity and drinker prototype (Conner et al. 1999; Norman, Armitage & Quigley 2007); alcohol availability (Marcoux & Shope 1997); low self-control (Higgins & Marcum 2005); beliefs (Murgraff, McDermott & Walsh 2001; Norman, Bennett & Lewis 1998); frequency of drinking (Jamison & Myers 2008); past behaviour (Conner et al. 1999); and accident rate and passenger time (Parker et al. 1992). Results of the current analysis of alcohol specific research are commensurate with findings of earlier investigations (Armitage & Conner 2001; Godin & Kok 1996); the TPB can predict and explain behaviours that are not entirely volitional.

Reviews: It is evident the TPB is able to account for a number of behaviours, including those associated with alcohol. The Armitage and Conner (2001) review examines independent studies published up to the end of 1997. Overall, the theory's main variables account for 39% of the variance in intentions and 27% of the variance in behaviours (Armitage & Conner 2001). Examples of behaviours, apart from alcohol use, explained by the TPB are: exercise, leisure choice, physical activity, transport choice, environmental policy measures, dishonesty, smoking cessation, condom use, weight and shape control, teaching intentions and testicular self-examination. Alcohol specific studies analysed by Armitage and Conner (2001) cover: problem drinking (Schlegel et al. 1992); modes of alcohol use by young people (O'Callaghan et al. 1997); and adolescent use and misuse of alcohol (Marcoux & Shope 1997). Results of the alcohol specific studies are not separated out for report; the authors make no specific alcohol policy recommendations. Their results, however, allude to the possibility of the TPB informing public health and social policy (Armitage & Conner 2001).

Findings of Godin and Kok (1996) are consistent with Armitage and Conner (2001); the TPB explains health specific behaviours, including alcohol related actions. The focus is a number of TPB based studies published between 1985 and 1996 (Godin & Kok 1996). Overall, the key variables account for 41% of variance in intentions and 34% of variance in health related behaviours. Those behaviours, apart from alcohol use, explained by the TPB include: addictive behaviours related to smoking, drugs and eating; driving intentions; clinical screening; exercise; and oral hygiene. Alcohol related studies, analysed in the Godin and Kok (1996) review, investigate issues like problem drinking (Schlegel et al. 1992) and drinking and driving (Parker et al. 1992). Like Armitage and Conner (2001), Godin and Kok (1996) make no specific recommendation that health policy be informed by the TPB. However, the potential of the TPB to inform broad public health policy and

alcohol specific policy is apparent from both reviews (Armitage & Conner 2001; Godin & Kok 1996).

Studies Reporting on Alcohol Use Behaviours: Findings demonstrate the efficacy of the TPB to predict alcohol related behaviours across a variety of conditions and circumstances. In all, eleven alcohol specific studies are analysed in the context of the TPB and its primary variables (*Table Five*). These investigations cover a variety of alcohol use behaviours including intention to use alcohol, alcohol consumption, frequency of use and misuse, drunkenness, 'binge' drinking, frequency of 'binge' drinking, drink driving intentions, and adherence to low risk alcohol guidelines. Eight of the eleven studies are university or college based, with three studies conducted external to these institutions (Marcoux & Shope 1997; Parker et al. 1992; Schlegel et al. 1992). The predominance of university and college based investigations is not remarkable, given a general willingness of students to participate in behavioural research projects and the prevalence of alcohol use in these populations. Sample size of the university based investigations range from 94 subjects (Norman, Armitage & Quigley 2007) to 494 subjects (McMillan & Conner 2003). Many of the studies utilise several groups of subjects and/or several research steps sequentially. Undergraduates predominately form the majority of samples. A range of ages, between 17 years (McMillan & Conner 2003) and 59 years (Johnston & White 2003), is apparent for the samples. These circumstances reflect more recent tertiary enrolment practices. The subject age range is more than adequate to represent the spectrum of alcohol use across the life span. Each of the eleven studies is primarily self-report in design, representing a possible bias in results.

Sample size is considerably larger in school based investigations when compared with studies conducted in university settings. Two of the eleven alcohol use studies interview

subjects from primary or secondary level educational facilities (Marcoux & Shope 1997; Schlegel et al. 1992). One study has a sample of 3,946 fifth to eight grade students (Marcoux & Shope 1997); the other includes a standardised random sample of 1,748 grade nine to grade twelve students (Schlegel et al. 1992). These investigations are longitudinal and self-report in design; both report significant TPB relationships. An assessment of intention to commit driving violations is also reviewed (Parker et al. 1992). This research is self-report in design and includes a sample of 881 drivers aged between 17 years and 55 years from a cross section of the driving community. The drinking and driving component of the investigation reports on the actions surrounding alcohol use and driving intentions; the study reveals significant associations with the TPB variables.

The level of effectiveness of the TPB to predict alcohol related behaviour varies between alcohol specific investigations. In the eleven studies reporting on alcohol use behaviours (*Table Five*), the TPB accounts for significant variance of between 7% change in intention to ‘binge’ drink (Jamison & Myers 2008) and 76% change in intention to use alcohol (Marcoux & Shope 1997). In the Jamison and Myers (2008) study, the minimal change in intention to ‘binge’ drink results from the predominant influence of drinking frequency and the drinking behaviour of friends. Across another four investigations, a variance in intention of between 15% and 60% is apparent (Conner et al. 1999; McMillan & Conner 2003; Norman, Armitage & Quigley 2007; Parker et al. 1992). In the Norman, Armitage and Quigley (2007) investigation, the TPB accounts for up to 58% of the variance in intention to ‘binge’ drink and 22% of ‘binge’ drinking behaviour. In the study, distinction is drawn between self-efficacy: feelings of confidence in one’s ability to perform behaviour; and perceived behavioural control: perception of control over performance of behaviour. The level of variance evident in the Norman, Armitage and Quigley (2007) findings represents a much higher proportion of change in ‘binge’ drinking than attributed

to the TPB in the Jamison and Myers (2008) study, where frequency of drinking and friends' drinking are the more significant influence. Other measures explain additional change, with subjective norms exerting some effect in the Norman, Armitage and Quigley (2007) investigation.

In other research, the TPB variables of intention and perceived behavioural control together account for significant variance of between 12% and 50% in alcohol use behaviour (Conner et al. 1999). The results of this study are mediated by the influence of past behaviour and self-identity as a drinker; both variables significantly contribute to behavioural outcomes. In addition, four of the alcohol use studies reveal a change in behaviour of between 20% and 40% (Marcoux & Shope 1997; McMillan & Conner 2003; Norman, Armitage & Quigley 2007; Norman, Bennett & Lewis 1998), demonstrating the strength of the TPB variables.

From the research investigated above, those situations where the TPB accounts for statistically significant variation are: intention to use alcohol (Higgins & Marcum 2005; Marcoux & Shope 1997); alcohol use (McMillan & Conner 2003); alcohol consumption and the effects of past behaviour (Conner et al. 1999); frequency of alcohol use and misuse (Marcoux & Shope 1997); adherence to low risk single occasion drinking guidelines (Murgraff, McDermott & Walsh 2001); problem drinking and getting drunk (Schlegel et al. 1992); 'binge' drinking (Jamison & Myers 2008; Johnston & White 2003; Norman, Armitage & Quigley 2007; Norman, Bennett & Lewis 1998); and drink driving (Parker et al. 1992). The utility of the TPB to predict alcohol use and drinking outcomes is established. Results confirm the efficacy of the TPB (Ajzen 1991; Ajzen & Madden 1986) to inform alcohol associated behaviours.

6.2.4 Discussion of Policy Relevance

Taking these findings into account, the TPB can be applied to the prevention of alcohol use and harms and could influence the effectiveness of public alcohol policy. Policy to improve drinkers' control is highly beneficial for those with low self-control over alcohol use; policy also needs to change drinkers' evaluations of alcohol through educational messages, and change perceptions that others are encouraging alcohol use (Higgins & Marcum 2005). Alcohol policy can assist with modifying drinkers' actual control within the context of alcohol consumption and intention to drink. With regards to alcohol use and misuse, a policy focus on external factors, such as reducing the availability of alcohol and the influence of alcohol using peers, is recommended (Marcoux & Shope 1997). As a focus for alcohol policy, the frequency of use is also important. Interventions can encourage parental discussion of media messages related to alcohol and parental involvement in prevention programs. Parents' influence on adolescent drinking is confirmed in the previous chapter in relation to alcohol availability.

Consideration of the TPB variables, such as perceived behavioural control, for alcohol policy can help prevent the harmful consumption associated with 'binge' drinking.

Interventions to alter environmental factors related to 'binge' drinking are emphasised (Norman, Armitage & Quigley 2007). Findings reflect those of the previous chapter.

Environmental factors, such as actual availability and other influences like the perception of availability through family and friends, impact on drinking outcomes. Also crucial to policy is the influence of external pressures, such as cues to drink, in the prevention of 'binge' drinking. The image of a 'binge' drinker is of additional relevance. Strategies that lessen the awareness of alcohol in the immediate drinking environment are necessary. As suggested by Norman, Armitage and Quigley (2007), drinking environments can be altered to encourage other activities apart from alcohol consumption. A focus on the provision of

meals and eating would reduce attention on alcohol as an available product and drinking as consumption behaviour. A regulatory system granting licensing preference to food based establishments could help change the prevalence of 'binge' drinking behaviours. The targeting of perceived drinking norms through health marketing and other media messages is also important (Norman, Armitage & Quigley 2007). These findings are consistent with other research where friends' drinking and frequency of drinking are significant influences on 'binge' drinking (Jamison & Myers 2008).

Management of the social environment, consistent with alcohol control measures discussed in the previous chapter, is an effective way to reduce 'binge' drinking, the frequency of 'binge' drinking, and drunkenness. Norman, Bennett and Lewis (1998) propose successful interventions for 'binge' drinking are those that influence the context of consumption; policy approaches can help reduce the harmful effects of heavy use. Positive control beliefs are also relevant according to these findings, but, with reference to the TPB, exert an indirect influence on alcohol behaviours. Ensuring drinkers' awareness of local bus timetables and taxi services is also recommended as a harm reduction approach (Norman, Bennett & Lewis 1998). These authors support the use of the media to modify social norms surrounding alcohol consumption, including the social costs of high consumption. Loss of credibility from appearing out of control in front of peers and the loss of spending power for other commodities are also useful emphases for alcohol interventions, according to these authors.

Drinking environments facilitating lower consumption help reinforce the 'safer drinking' message. Murgraff, McDermott and Walsh (2001) draw attention to the use environment in enabling drinkers to remain within safer drinking limits. They suggest health messages to convey the importance of drinking parameters and low consumption as sufficient to

enjoy alcohol. Both are important to early intervention and prevention. Interventions could be introduced in populations known to exceed drinking guidelines, even if only occasionally (Murgraff, McDermott & Walsh 2001). Specific messages can target vulnerable groups most at risk. Also recommended by these authors are server interventions to encourage drinkers to stay within prescribed drinking limits.

These findings are important in the Australian context. The promotion of the Australian Alcohol Guidelines (National Health and Medical Research Council 2009) need to be accompanied by marketing messages to encourage the idea that genuine enjoyment from alcohol is possible at low levels of consumption; higher levels lead to harm and negate the pleasures associated with low levels of use. There are a number of exceptions to the 'low consumption' message. Those vulnerable to harms, such as youth and pregnant women, should not consume alcohol at all (National Health and Medical Research Council 2009). Authors of the only Australian study reviewed conclude the TPB is relevant to the prediction of 'binge' drinking and to behavioural change related to alcohol, and that findings can inform the development of interventions such as advertising campaigns (Johnston & White 2003). Group norms and group identification are also important. Johnston and White (2003) state "by identifying relevant social influence variables, and establishing a link between the norms of behaviourally relevant reference groups and individual group members' behaviour, the performance of socially desirable behaviours such as safe alcohol consumption can be encouraged" (p. 75).

Drinkers can be influenced through alcohol policy that increases and supports control over drinking and associated actions. Efforts aimed at behavioural change can focus on the potential costs and benefits associated with drink driving and the real possibility of personal control over driving violations (Parker et al. 1992). Nonetheless, age has some

influence on an intention to drink and drive. Others suggest that further work is needed to develop measures of drinking habit and routine; research can enlighten the design of interventions for problematic drinking behaviours (Conner et al. 1999). Findings can be used to develop policy informed by the influence of past behaviour, self-identity as a drinker and intentions to consume alcohol. Also emphasised are the links between health intentions and environmental factors, crucial to negating the effects of past behaviour. According to results, little benefit would be gained from a focus on gender or age.

Additional support for applying the TPB to alcohol outcomes and alcohol interventions comes from a study into problem drinking (Schlegel et al. 1992). These researchers suggest preventive initiatives can aim to create attitudes and beliefs inconsistent with excessive drinking, with the primary purpose of increasing drinker control. An emphasis on the negative social aspects of drunkenness is also suggested by these authors, compatible with a focus on the potential costs of drinking, as proposed by Parker and others (1992). Only one investigation in the current analysis makes no specific policy related recommendations (McMillan & Conner 2003). These findings confirm the significance of the TPB to alcohol use intentions and alcohol consumption behaviours. Descriptive norms, as indication of the drugs used by partners, friends, family members or health experts, are also relevant in the McMillan and Conner (2003) study. The influence of significant others is an important consideration in public alcohol policy.

A review of behavioural change interventions further emphasises the importance of the TPB (Hardeman et al. 2002). The investigation involves twenty-one interventions of health related behaviours such as smoking cessation, exercise, testicular self-examination, and drink driving, as well as general actions such as signing up for a chemistry course and job seeking behaviour. In this research, half the interventions based on the TPB are

effective in changing intentions; two thirds are effective in changing behaviours. The authors of the study concur that “this review may be a first step towards more robust and unifying methods for intervention development and evaluation the TPB may have a valuable contribution to make to developing effective interventions aimed at behaviour change where motivation has not been established” (p. 151). While only one study involving alcohol use behaviour forms part of the analysis of Hardeman and colleagues (2002), findings indicate the TPB can contribute to the design of interventions for alcohol, and in this way adds to alcohol policy success.

6.2.5 Significant Findings

Consistent with findings, the influence of the TPB on drinking behaviours can be used to inform public alcohol policy in the following areas:

- **modification of behavioural control in the context of intention to use alcohol** (Higgins & Marcum 2005);
- **change to drinkers’ self-identity**, taking into account the influence of past behaviour on intention to consume alcohol and drinking behaviour (Conner et al. 1999);
- **reduction in the frequency of use and misuse** (Marcoux & Shope 1997);
- **reduction in problem drinking and drunkenness** (Schlegel et al. 1992);
- **change to ‘binge’ drinking intentions; and a reduction in the frequency of ‘binge’ drinking, ‘binge’ drinking behaviours, and ‘binge’ drinking harms** (Jamison & Myers 2008; Johnston & White 2003; Norman, Armitage & Quigley 2007; Norman, Bennett & Lewis 1998);

- **promotion of adherence to low risk drinking guidelines and the gains associated with lower risk drinking** (Murgraff, McDermott & Walsh 2001); and
- **modification of drink driving intentions** (Parker et al. 1992).

These findings are used to build a model for public alcohol policy. Other significant associations not central to the TPB are: drinkers' self-identity and prototype similarity (Conner et al. 1999; Norman, Armitage & Quigley 2007); friends' drinking, descriptive norms, group norms and group identification (Jamison & Myers 2008; Johnston & White 2003; McMillan & Conner 2003); age (Parker et al. 1992); low self-control (Higgins & Marcum 2005); and alcohol availability (Marcoux & Shope 1997). Indirect variables of the TPB, such as beliefs, are responsible for additional variance (Murgraff, McDermott & Walsh 2001; Norman, Bennett & Lewis 1998). The types of interventions possible using the TPB are discussed later in the thesis.

It is evident, from the results of the current analysis and supported by the views of the various researchers discussed above, that the TPB can reliably inform public alcohol policy for Australia. There are a number of ways this could occur, including knowledge for policy frame and strategic direction. Even so, no alcohol studies are identified that use a TPB framework for Indigenous community research in Australia. Nevertheless, the findings of *Stage One* can help inform strategies for this subpopulation at risk. The results of analysis of availability measures undertaken in *Chapter Five* also contribute to this aim. With the strength of the TPB clearly evident, it is useful to explore whether a particular variable of the theory can be applied to public alcohol policy and a public alcohol policy model.

6.3 Stage Two: Analysis of the Relative Contribution of Theory of Planned Behaviour Variables

Stage Two investigates the relative contribution of the primary TPB variables to understanding alcohol behaviours and informing alcohol policy. The predominant attributes of alcohol use and consumption behaviours are further sought. Alcohol specific studies analysed in *Stage One* are further examined in *Stage Two* to:

- investigate how the key variables of the TPB are associated with alcohol related behaviours;
- establish the strongest variable of the TPB to predict drinking outcomes; and
- confirm the comparative relevance of the primary TPB variables to inform public alcohol policy and a public alcohol policy model.

With a number of alcohol scenarios explained by the TPB (*Table Five*), it is questioned whether a single variable can capture the essence of the theory in relation to alcohol consumption and alcohol policy. The second stage of the analysis details for each study: research authors and year; and the significance of each primary variable of the TPB, ‘attitude’, ‘subjective norm’ and ‘perceived behavioural control’, in relation to intention and/or behaviour. The strongest and subsequent predictor variables of the TPB are indicated.

In the TPB: attitudes represent positive or negative evaluations of performing a given behaviour; social norms indicate perception of the social expectations surrounding behaviour; and perceived behavioural control reflects how easy or difficult the performance of behaviour is likely to be (Godin & Kok 1996). To ensure a greater level of consistency in reported findings, indirect belief measures of the TPB included in alcohol specific investigations (Murgraff, McDermott & Walsh 2001; Norman, Bennett & Lewis

1998) are not considered here. According to the TPB (Ajzen 1991; Ajzen & Madden 1986), formative beliefs do not have a direct influence on behaviour. Rather, attitudes, subjective norms, perceived behavioural control and intentions are the more proximal measures of drinking behaviours. These are the variables examined for their comparative influence on alcohol consumption and relevance for public alcohol policy.

The Armitage and Connor analysis (2001) and the Godin and Kok review (1996) provide some indication of the contribution of individual variables of the TPB to general behavioural change. According to the findings of Armitage and Connor (2001), perceived behavioural control emerges as a strongly predictive variable explaining intentions and behaviours in a number of domains. In their review of the TPB related literature, published up to 1997, subjective norm is the weakest variable overall. In the Godin and Kok (1996) review of the TPB related health behaviour literature, perceived behavioural control and attitude are the most often reported variables of significance. Health related decisions, including those associated with alcohol, are primarily influenced by intention, which is significantly predicted by perceived behavioural control (Godin & Kok 1996).

6.3.1 Further Analysis of Studies

Table Six illustrates a further level of analysis of the eleven alcohol specific studies investigated in *Table Five*. This analysis demonstrates the comparative influence of each of the variables of the TPB on alcohol intentions and alcohol associated behaviours.

Research is separated into five sections to reflect drinking categories: *Adherence to Low Risk Single Occasion Drinking Guidelines* (N=1); *Alcohol Use* (N=4); *‘Binge’ Drinking Behaviour* (N=4); *Problem Drinking and Getting Drunk* (N=1); and *Drinking and Driving* (N=1). Results show variability in how attitudes, subjective norms, perceived behavioural control, and intentions contribute to alcohol related behaviours.

Table 6: Relative Contribution of the Theory of Planned Behaviour Variables to Alcohol Related Behaviours

Adherence to Low Risk Single Occasion Drinking Guidelines (N=1)				
Authors and Year	Attitudes (ATs)	Subjective Norms (SNs)	Perceived Behavioural Control (PBC)	Intention (INT)
Murgraff, McDermott & Walsh, 2001 Note: Only step one reported here	4% $p < 0.01$ variance in behaviour when the TPB measures are included (second highest predictor variable)	Not Significant (lowest predictor variable)	8% $p < 0.001$ variance in behaviour when the TPB measures are included (highest predictor of behaviour)	Not reported in relation to ATs, SNs, PBC or drinking behaviour
Alcohol Use (N=4)				
Authors and Year	Attitudes (ATs)	Subjective Norms (SNs)	Perceived Behavioural Control (PBC)	Intention (INT)
Conner, Warren, Close & Sparks, 1999	Between 28% and 40% variance in intention is explained by ATs, SNs and PBC			
			Between 12% and 50% variance in behaviour is accounted for by PBC and INT	
Higgins & Marcum, 2005	31% $p < 0.05$ variance in intention (highest predictor of intention)	26% $p < 0.05$ variance in intention (second highest predictor of intention)	-16 % $p < 0.05$ variance in behaviour <i>low actual self-control</i> significantly predicts variance in ATs 30% $p < 0.05$; SNs 31% $p < 0.05$; PBC -17% $p < 0.05$; and behaviour 17% $p < 0.05$; (PBC did not significantly predict INT)	30% $p < 0.05$ variance in behaviour (highest predictor of behaviour)
Marcoux & Shope, 1997	Accounts for less than 1% $p < 0.05$ variance in intention (lowest predictor of intention)	Second highest predictor of intention Not tested in relation to	Highest predictor of intention $p < 0.05$ (PBC measured in this study by	26.1% $p < 0.05$ variance in alcohol use behaviour ; 38.4% $p < 0.05$ variance in frequency of alcohol use behaviour ; and 30.6%

	Not tested in relation to behaviour	behaviour	indicators of peer pressure, friends' experience, confidence in saying no, and alcohol availability) Not tested in relation to behaviour	p<0.05 variance in the misuse of alcohol behaviour (strongest predictor variable)
McMillan & Conner, 2003	18.8% p<0.001 variance in intention to use alcohol (second highest variance in intention)	-11.0% p<0.05 variance in intention (proxy for injunctive norms) (lowest variance in intention)	33% p<0.001 variance in intention to use alcohol (highest variance in intention)	39.5% p<0.001 variance in alcohol use behaviour (highest variance in behaviour)
			25.1% p<0.01 variance in alcohol use behaviour (second highest variance in behaviour)	
			Together PBC and INT account for 28.9% p<0.001 of alcohol use behaviour	
‘Binge’ Drinking Behaviour (N=4)				
Authors and Year	Attitudes (ATs)	Subjective Norms (SNs)	Perceived Behavioural Control (PBC)	Intention (INT)
Jamison & Myers, 2008	15% p<0.05 variance in intention to drink (second highest variance in intention)	16% p<0.05 variance in intention to drink (highest variance in intention)	Not significantly related to intention to drink, total weekly consumption behaviour , or ‘binge’ drinking behaviour	79% p<0.001 of total weekly alcohol consumption as behaviour ; and 26% p<0.01 of variation in ‘binge’ drinking behaviour
Johnston and White, 2003	32 % p<0.001 variance in intention to ‘binge’ drink (second highest variance in intention) Not a significant predictor of ‘binge’ drinking behaviour	27% p<0.001 variance in intention to ‘binge’ drink (lowest variance in intention) Not a significant predictor of ‘binge’ drinking behaviour	Self-efficacy (as a proxy measure for PBC) 33% p<0.001 variance in intention to ‘binge’ drink (highest variance in intention)	47% p<0.001 variance in ‘binge’ drinking behaviour Only significant predictor of ‘binge’ drinking behaviour
			Not a significant predictor of ‘binge’ drinking behaviour	

Norman, Armitage & Quigley, 2007	70% $p < 0.001$ variance in intention to 'binge' drink (highest variance in intention)	Not significantly related to either intention or 'binge' drinking behaviour (lowest predictor variable overall)	Self-efficacy (as a proxy measure for PBC) 17% $p < 0.05$ variance in intention -22 % $p < 0.05$ variance in 'binge' drinking behaviour (PBC) (second highest predictor of intention and behaviour)	32% $p < 0.01$ variance in 'binge' drinking behaviour (highest predictor of behaviour)
Norman, Bennett & Lewis, 1998	Not significant	Not significant (lowest predictor variable)	-28% $p < 0.01$ variance in frequency of 'binge' drinking behaviour (highest and only significant predictor of behaviour)	Not reported in relation to ATs, SNs, PBC or 'binge' drinking behaviour
Problem Drinking and Getting Drunk (N=1)				
Authors and Year	Attitude (ATs)	Subjective Norms (SNs)	Perceived Behavioural Control (PBC)	Intention (INT)
Schlegel, D'Avernas, Zanna, DeCourville & Manske, 1992	36% $p < 0.001$ variance in intention to get drunk for <i>nonproblem drinkers with no problem drinking history</i> 35% $p < 0.001$ variance in intention to get drunk for <i>nonproblem drinkers with a history of problem drinking</i> 46% $p < 0.001$ variance in intention to get drunk for <i>current problem drinkers irrespective of drinking history</i>	23% $p < 0.05$ variance in intention to get drunk for <i>nonproblem drinkers with no problem drinking history</i> 20% $p < 0.05$ variance in intention to get drunk for <i>nonproblem drinkers with a history of problems drinking</i> Not significantly related to variance in intention for <i>current problem drinkers irrespective of drinking history</i>	-25% $p < 0.01$ variance in intention for <i>nonproblem drinkers with no problem drinking history</i> -28% $p < 0.01$ variance in intention for <i>current nonproblem drinkers with a history of problem drinking</i> -26% $p < 0.01$ variance in frequency of getting drunk (behaviour) for <i>current problem drinkers irrespective of drinking history</i>	62% $p < 0.001$ variance in frequency of getting drunk (behaviour) for <i>nonproblem drinkers with no problem drinking history</i> 45% $p < 0.001$ variance in frequency of getting drunk (behaviour) for <i>nonproblem drinkers with a history of problem drinking</i> 34% $p < 0.001$ variance in frequency of getting drunk (behaviour) for <i>current problem drinkers irrespective of drinking history</i>

Drinking and Driving (N=1)				
Authors and Year	Attitude (ATs)	Subjective Norms (SNs)	Perceived Behavioural Control (PBC)	Intention (INT)
Parker, Manstead, Stradling, Reason & Baxter, 1992	21.3% $p < 0.001$ variance in intention to drink and drive accounted for by ATs and SNs together		<p>PBC (represented by a direct measure of control beliefs) accounts for 20.9% $p < 0.001$ variance in intention to drink and drive</p> <p>(highest predictor variable)</p> <p>PBC accounts for almost as much variance as ATs & SNs together</p>	Effects of INT on behaviour not reported in the study

6.3.2 Discussion of Results (*Stage Two*)

The relative impact of the TPB variables - attitudes, subjective norms, and perceived behavioural control - on alcohol intentions and alcohol associated behaviours is reported. The influence of intention, as an intermediate variable of the TPB, is also discussed. All studies demonstrate the predictive and explanatory power of key variables of the TPB, with size of effect varying between investigations. Attitudes account for 70% ($p < 0.001$) variance in intention to 'binge' drink (Norman, Armitage & Quigley 2007), and less than 1% change in intention to use alcohol (Marcoux & Shope 1997). In the Marcoux and Shope (1997) study, external factors like peer pressure, friends' experience with alcohol, normative beliefs of parents, and alcohol availability are far more important than attitudes in the prediction of intentions to use alcohol.

Subjective norms do not explain variance in two studies (Murgraff, McDermott & Walsh 2001; Norman, Armitage & Quigley 2007; Norman, Bennett & Lewis 1998). But across the remaining investigations, social norms account for significant variation in intentions: as little as -11% ($p < 0.05$); and as much as 26% ($p < 0.05$) (Higgins & Marcum 2005; Jamison & Myers 2008; Johnston & White 2003; Marcoux & Shope 1997; McMillan & Conner 2003; Schlegel et al. 1992). Social norms do not directly contribute to change in behaviour, an important public policy consideration.

Perceived behavioural control predicts as much as 33% ($p < 0.001$) of intentions to use alcohol (McMillan & Conner 2003) and 33% ($p < 0.001$) of intentions to 'binge' drink (Johnston & White 2003). In another study, perceived behavioural control influences single occasion drinking only as much as 8% ($p < 0.001$), but nonetheless is the strongest TPB variable (Murgraff, McDermott & Walsh 2001). Variation in the influence of perceived behavioural control is reflective of the interplay of control factors in alcohol use

behaviours (Heather 1995; Higgins & Marcum 2005) and reveals how intentions and decisions to use alcohol depend on a complex array of thought processes and environmental influences. Differences are also reflective of a level of imprecision in the various measures of the TPB. Another of the TPB variables, intention, accounts for up to 79% ($p < 0.001$) of total weekly consumption (Jamison & Myers 2008). Between categories of alcohol use behaviours, the individual variables of the TPB are differentially predictive. The influence of the primary TPB variables are next reported for categories of alcohol related research.

Adherence to Low Risk Single Occasion Drinking Guidelines: Results of one study report the influence of TPB variables on adherence to low risk single occasion drinking guidelines (Murgraff, McDermott & Walsh 2001). In this research, perceived behavioural control is the strongest predictor variable, representing 8% ($p < 0.001$) of change in single occasion drinking. Attitudes is the second highest, responsible for 4% ($p < 0.01$) of variation in single occasion drinking. The subjective norms variable does not account for significant variation in single occasion drinking and is the weakest TPB variable of the investigation. Overall, perceived behavioural control emerges as the strongest predictor of low risk single occasion drinking (Murgraff, McDermott & Walsh 2001).

Alcohol Use: Four studies report on alcohol use (Conner et al. 1999; Higgins & Marcum 2005; Marcoux & Shope 1997; McMillan & Conner 2003). In the Conner and colleagues (1999) study, attitudes, subjective norms and perceived behavioural control together explain between 28% and 40% of variance in drinking intentions. Between 12% and 50% of the change in alcohol use behaviour is accounted for by perceived behavioural control and intention together (Conner et al. 1999). As three prospective samples form the basis of the investigation, some diversity in statistical strength is apparent between separate

components of the research. Moreover, significant effects are evident across all three stages of the Conner and colleagues (1999) study, with self-identity as a drinker and past behaviour also contributing to the prediction of drinking intentions.

Another investigation of alcohol use reveals attitudes as the strongest TPB variable, explaining 31% of variation in intentions, and subjective norms as the second highest predictor, representing 26% of variation in intention to use alcohol (Higgins & Marcum 2005). Perceived behavioural control does not significantly predict intention in this investigation, but the inclusion of a measure of low self-control shows significant associations with attitudes (30%), subjective norms (31%), and perceived behavioural control (-17%). Whilst perceived behavioural control accounts for -16% of variance in alcohol use, low self-control accounts for 17%, and intention accounts for 30% change in alcohol use behaviour. Levels of significance are reported at the $p < 0.05$ level (Higgins & Marcum 2005).

Research into alcohol use, frequency of use and misuse shows perceived behavioural control is the strongest predictor variable in relation to intention; subjective norms is the second highest; and attitudes the lowest, representing less than 1% variance (Marcoux & Shope 1997). In the investigation, intention accounts for 26.1% variation in alcohol use, 38.4% of frequency of use, and 30.6% of misuse of alcohol. All primary variables of the TPB attain significance at the $p < 0.05$ level. Independent variables, like peer pressure and friends' experience with alcohol, also have a significant influence. The study reveals that peer influence and friendship groups are important across all stages of adolescence (Marcoux & Shope 1997) and are best not ignored in strategic intervention.

Also demonstrated is the strong prediction of drinking intentions through perceived behavioural control, accounting for 33% ($p < 0.001$) of overall variance in plans to consume

alcohol (McMillan & Conner 2003). Pressure to use alcohol is frequently reported in this investigation. Attitudes is the second highest predictor of intentions, representing 18.8% ($p < 0.001$) of the change in intention to use alcohol. Subjective norms has the lowest level of statistical significance ($p < 0.05$), accounting for -11% change in intentions. Intention explains 39.5% ($p < 0.001$) of variance in alcohol use behaviours and is the strongest TPB variable overall in the investigation (McMillan & Conner 2003).

In two of the four alcohol use studies, perceived behavioural control is the strongest predictor of intentions (Marcoux & Shope 1997; McMillan & Conner 2003). Across these two studies, intention is also a significant predictor, accounting for between 26.1% ($p < 0.05$) (Marcoux & Shope 1997) and 39.5% ($p < 0.001$) (McMillan & Conner 2003) change in alcohol use behaviours. In the McMillan and Conner (2003) investigation, perceived behavioural control represents 25.1% ($p < 0.01$) of variance in alcohol use behaviour. Another study reveals perceived behavioural control together with intention accounts for between 12% and 50% of the change in alcohol use behaviour (Conner et al. 1999). In further research, when a measure of low self-control is included, perceived behavioural control, together with low self-control, is responsible for as much as a third ($p < 0.05$) of variance in alcohol use behaviours (Higgins & Marcum 2005). Another 30% ($p < 0.05$) of variance is represented by intention to use alcohol.

Across three of the four alcohol use studies (Higgins & Marcum 2005; Marcoux & Shope 1997; McMillan & Conner 2003), variability is evident in the influence of attitudes from less than 1% ($p < 0.05$) (Marcoux & Shope 1997) to 31% ($p < 0.05$) in drinking intentions (Higgins & Marcum 2005). Subjective norms account for up to 26% ($p < 0.05$) of change in intentions (Higgins & Marcum 2005). Perceived behavioural control explains as much as 33% ($p < 0.001$) of variance in alcohol associated intentions, and up to 25.1% ($p < 0.01$) of

change in alcohol related behaviours (McMillan & Conner 2003). Intention on its own predicts variation in alcohol use of between 26.1% ($p<0.05$) (Marcoux & Shope 1997) and 39.5% ($p<0.001$) (McMillan & Conner 2003). In conjunction with intention, perceived behavioural control accounts for up to 50% change in behaviour in one study alone (Conner et al. 1999). In all alcohol use studies reviewed, perceived behavioural control exerts a significant influence on drinking behaviour directly, or indirectly, through drinking intentions (Conner et al. 1999; Higgins & Marcum 2005; Marcoux & Shope 1997; McMillan & Conner 2003). With regards to these findings, the validity of perceived behavioural control as a reliable predictor of alcohol intentions and consumption behaviours is confirmed. Perceived behavioural control has the potential to inform public alcohol policy.

'Binge' Drinking Behaviour: Four studies investigate 'binge' drinking behaviour (Jamison & Myers 2008; Johnston & White 2003; Norman, Armitage & Quigley 2007; Norman, Bennett & Lewis 1998). Johnston and White's Australian investigation reveals a proxy measure of perceived behavioural control, self-efficacy (Bandura 1925), is responsible for the most diversity in intention to 'binge' drink. Through this proxy measure, perceived behavioural control explains 33% ($p<0.001$) variation in intention; attitudes is the second highest predictor of intentions representing 32% ($p<0.001$) of change; subjective norms is the weakest variable, but nonetheless accounts for 27% ($p<0.001$) variation in intention to 'binge' drink (Johnston & White 2003). In the study, group norms significantly predict drinking intentions, particularly for those who show strong identification with their reference group. In addition, intention as a variable of the TPB significantly predicts 47% ($p<0.001$) of change in 'binge' drinking behaviour and is the only variable of the TPB to do so in this research (Johnston & White 2003). Results are likely reflective of the determination of a high proportion of drinkers in Australia to 'binge' drink and regularly

aim to get 'drunk'. However, in a Welsh study, perceived behavioural control is the highest predictor, accounting for -28% ($p < 0.01$) of the variation in the frequency of 'binge' drinking (Norman, Bennett & Lewis 1998). Neither attitudes nor subjective norms significantly predict frequency of 'binge' drinking in the Welsh investigation. These relative results may reflect differences in how 'binge' drinking is viewed in Australia when compared with other countries, such as Wales. Variation may also be accounted for by differences between the two studies in measures of 'binge' drinking.

The remaining two studies of 'binge' drinking (Jamison & Myers 2008; Norman, Armitage & Quigley 2007) differ somewhat in findings from Johnston and White (2003) and Norman, Bennett and Lewis (1998). In the Jamison and Myers (2008) study of undergraduate and postgraduate university students' drinking, perceived behavioural control is not significantly related to intention to drink, total weekly consumption, or 'binge' drinking behaviour. Subjective norms account for the highest change in intention to 'binge' drink of 16% ($p < 0.05$); friends' drinking exerts considerable influence on drinking outcomes. Attitudes represent the second highest variation in intentions of 15% ($p < 0.05$). In this investigation, 'binge' drinkers are influenced by drinking peers and other social factors (Jamison & Myers 2008). The authors report pressure to drink is greatest for males; undergraduates are more inclined to be influenced by the size of the drinking group, price specials for alcohol, and the overall availability of alcohol. Even so, almost 80% ($p < 0.001$) of the difference in total weekly consumption is explained by intention, with intention also accounting for up to 26% ($p < 0.01$) of variance in 'binge' drinking behaviour (Jamison & Myers 2008).

Results of the remaining 'binge' drinking study to be examined indicate that attitudes explain 70% ($p < 0.001$) of variance in intention to 'binge' drink (Norman, Armitage &

Quigley 2007). In addition, self-efficacy as a representative measure of perceived behavioural control, explains up to 17% ($p < 0.05$) of variation in drinking intentions in the Norman, Armitage and Quigley (2007) study. Subjective norms is not significantly related to 'binge' drinking intentions or behaviours, and is the lowest TPB predictor overall. As an inverse relationship, perceived behavioural control accounts for -22% ($p < 0.05$) of variation in 'binge' drinking; intention accounts for the highest level of variation, as 32% ($p < 0.01$), in 'binge' drinking behaviour. Perceived behavioural control and intention together represent more than half the variance in 'binge' drinking behaviour in the investigation.

Across the four 'binge' drinking studies, attitudes account for between 15% ($p < 0.05$) (Jamison & Myers 2008) and 70% ($p < 0.001$) (Norman, Armitage & Quigley 2007) of change in intentions. Attitudes show no significant effect in one 'binge' drinking study (Norman, Bennett & Lewis 1998). Subjective norms explain between 16% ($p < 0.05$) (Jamison & Myers 2008) and 27% ($p < 0.001$) (Johnston & White 2003) of variance in intentions, but are not a significant influence in two of the four 'binge' drinking studies (Norman, Armitage & Quigley 2007; Norman, Bennett & Lewis 1998). Perceived behavioural control represents between 17% ($p < 0.05$) (Norman, Armitage & Quigley 2007) and 33% ($p < 0.001$) (Johnston & White 2003) of variance in intention to 'binge' drink, as well as -28% ($p < 0.01$) (Norman, Bennett & Lewis 1998) of change in 'binge' drinking behaviour.

In one investigation, perceived behavioural control does not predict 'binge' drinking behaviour directly, but significantly influences up to 33% ($p < 0.001$) of intentions to 'binge drink' (Johnston & White 2003). Across all four 'binge' drinking investigations, intention explains 26% ($p < 0.01$) of 'binge' drinking behaviours and 79% ($p < 0.001$) of

total weekly consumption, a distinction reported in one study alone (Jamison & Myers 2008). Taking the results of the four 'binge' drinking investigations into account (Jamison & Myers 2008; Johnston & White 2003; Norman, Armitage & Quigley 2007; Norman, Bennett & Lewis 1998), perceived behavioural control as well as intentions and attitudes emerge as particular variables of interest. Overall, subjective norms exert indirect and less influence on 'binge' drinking behaviours than attitudes, perceived behavioural control, or intentions.

Problem Drinking and Getting Drunk: Another study reports on problem drinking and getting drunk, with variation evident between three drinker groups (Schlegel et al. 1992). Attitudes represent 36% ($p < 0.001$) of change in intention to get drunk for nonproblem drinkers with no alcohol problems in their drinking history; 35% ($p < 0.001$) of variation in intention for nonproblem drinkers with a problematic drinking history; and 46% ($p < 0.001$) of change in intention to get drunk for current problem drinkers, irrespective of drinking history. Perceived behavioural control explains -25% ($p < 0.01$) of variance in intention for those that have never been problem drinkers; -28% ($p < 0.01$) of variation in intention for current nonproblem drinkers with a history of past drinking problems; as well as -26% ($p < 0.01$) of variance in the frequency of getting drunk for current problem drinkers irrespective of drinking history, all as inverse relationships. Intention accounts for between 34% and 62% ($p < 0.001$) of change in behaviour across all three groups of participants in the study. Subjective norms is the lowest predictor, but nonetheless explains between 20% and 23% of variation in intentions ($p < 0.05$) across two groups of drinkers. Subjective norms are not significantly related to intentions for current problem drinkers, irrespective of their drinking history (Schlegel et al. 1992).

Drinking and Driving: The remaining study explains driving intentions (Parker et al. 1992). In this research, perceived behavioural control represents almost as much variance in intention to drink and drive: 20.9% ($p < 0.001$), as attitudes and subjective norms together: 21.3% ($p < 0.001$). Of all the TPB variables, perceived behavioural control on its own is the strongest predictor of intentions to drink and drive.

Overall, in six of the eleven alcohol studies, the perceived behavioural control variable is the strongest predictor of drinking intentions (Johnston & White 2003; Marcoux & Shope 1997; McMillan & Conner 2003; Parker et al. 1992) and alcohol associated behaviours (Murgraff, McDermott & Walsh 2001; Norman, Bennett & Lewis 1998). Across other studies, perceived behavioural control is the second highest predictor of drinking intentions (Norman, Armitage & Quigley 2007; Schlegel et al. 1992), and the second highest predictor of drinking behaviours (McMillan & Conner 2003; Norman, Armitage & Quigley 2007). Attitudes account for the highest variance in intentions in three of the eleven studies (Higgins & Marcum 2005; Norman, Armitage & Quigley 2007; Schlegel et al. 1992), and the second highest variance in intentions across another three studies (Jamison & Myers 2008; Johnston & White 2003; McMillan & Conner 2003). Attitudes are responsible for the second highest change in adherence to low risk single occasion drinking guidelines (Murgraff, McDermott & Walsh 2001). Across all studies analysed, subjective norms is the weakest predictor of alcohol related intentions; social norms do not directly predict alcohol use behaviours, an important thesis consideration.

6.3.3 Significant Findings

Results of the analysis, comparing the key variables of the TPB (*Table Six*), confirm perceived behavioural control as a significant predictor of drinking intentions and/or alcohol related behaviours in the following circumstances:

- **adherence to low risk single occasion drinking** (Murgraff, McDermott & Walsh 2001);
- **alcohol use situations** (Conner et al. 1999; Higgins & Marcum 2005; Marcoux & Shope 1997; McMillan & Conner 2003);
- **‘binge’ drinking** (Johnston & White 2003; Norman, Armitage & Quigley 2007; Norman, Bennett & Lewis 1998);
- **problem drinking and getting drunk** (Schlegel et al. 1992); and
- **drinking and driving** (Parker et al. 1992).

As well, results confirm actual control, as low self-control, is a significant predictor of alcohol related behaviours by:

- **directly influencing alcohol use** (Higgins & Marcum 2005); and
- **indirectly influencing alcohol use** through ‘perceived behavioural control’ (Higgins & Marcum 2005).

The situations emphasised above are those where perceived behavioural control has the greatest effect on behavioural outcomes, of relevance to alcohol policy. Findings are used to build a model for public alcohol policy, the foundations of which are now established.

It is evident, from the eleven studies investigated in *Stage Two*, that the strongest predictor of drinking behaviour is perceived behavioural control, as a direct influence and indirect

influence through intentions. In circumstances where self-control is low, actual control adds to the predictive strength of perceived behavioural control (Higgins & Marcum 2005). Intention directly accounts for more variance in behaviour than perceived behavioural control in six of the studies (Higgins & Marcum 2005; Jamison & Myers 2008; Johnston & White 2003; McMillan & Conner 2003; Norman, Armitage & Quigley 2007; Schlegel et al. 1992), four of which cover ‘binge’ drinking or getting drunk. An important aspect of alcohol behaviours is that “they are driven by forces over which the person has limited volitional control the dependent person knows that they should stop the behaviour, but are either unwilling or unable to do so” (Borland 2010, p. 1894).

In those investigations where intention is a stronger direct predictor of behaviour than perceived behavioural control on its own, the following is evident. Low self-control and perceived behavioural control together account for more variance in alcohol use than intention (Higgins & Marcum 2005). Across a number of drinking scenarios, perceived behavioural control contributes up to a third of the variance in intention to get drunk and frequency of getting drunk (Schlegel et al. 1992). In the Schlegel and others (1992) study, perceived behavioural control is differentially predictive for *nonproblem* drinkers when compared with *problem* drinkers. The discrimination evident in these results alludes to the need for the targeting of at risk populations in public policy and intervention.

In an Australian study, perceived behavioural control shows a sizeable effect, accounting for approximately a third of the variance in intention to ‘binge’ drink (Johnston & White 2003). In a United Kingdom investigation, the combined effects of perceived behavioural control on intention to ‘binge’ drink and ‘binge’ drinking behaviour closely mirror the size of effect of intention on its own (Norman, Armitage & Quigley 2007). Taking into account the relative influence of the TPB variables, perceived behavioural control emerges

from the analysis as a variable predicting drinking intentions and/or consumption behaviours in all but one of the eleven alcohol related studies analysed (Jamison & Myers 2008). The perceived behavioural control variable has a greater influence overall on behaviour than intention, considering both direct and indirect effects.

6.4 Summary of Findings (*Stage One* and *Stage Two*)

Results of the investigation are summarised. Results of *Stage One* reveal the TPB can significantly predict a number of alcohol intentions and consumption related behaviours.

These relationships are relevant to policy as follows:

- broad public policy and health focused policy that impacts on alcohol use and associated harms (Armitage & Conner 2001; Godin & Kok 1996); and
- interventions focused on behaviour change (Hardeman et al. 2002).

Likewise, TPB relationships are useful in predicting alcohol behaviours and informing alcohol policy. These associations are relevant to:

- alcohol policy initiatives and strategic interventions focused on alcohol use behaviours and drinking environments (Conner et al. 1999; Higgins & Marcum 2005; Jamison & Myers 2008; Johnston & White 2003; Marcoux & Shope 1997; McMillan & Conner 2003; Murgraff, McDermott & Walsh 2001; Norman, Armitage & Quigley 2007; Norman, Bennett & Lewis 1998; Parker et al. 1992; Schlegel et al. 1992).

Results of *Stage Two* of the analysis indicate:

- ‘perceived behavioural control’ is the most significant contributor to intentions and/or behaviours in a majority of alcohol related situations (Conner et al. 1999; Higgins & Marcum 2005; Johnston & White 2003; Marcoux & Shope 1997; McMillan & Conner 2003; Murgraff, McDermott & Walsh 2001; Norman, Armitage & Quigley 2007; Norman, Bennett & Lewis 1998; Parker et al. 1992; Schlegel et al. 1992);
- ‘attitudes’ add to the prediction of intentions together with ‘perceived behavioural control’ (Higgins & Marcum 2005; Jamison & Myers 2008; Johnston & White 2003; McMillan & Conner 2003; Murgraff, McDermott & Walsh 2001; Norman, Armitage & Quigley 2007; Schlegel et al. 1992);
- ‘subjective norms’ exert an influence in some alcohol use situations (Higgins & Marcum 2005; Marcoux & Shope 1997), and some ‘binge’ drinking circumstances (Jamison & Myers 2008), including in Australia (Johnston & White 2003); and
- as a measure of actual control, ‘low self-control’ exerts a significant influence on alcohol related behaviour directly, and indirectly through ‘perceived behavioural control’ (Higgins & Marcum 2005), thus adding to the overall prediction of behaviour through perceptions.

It is likely that perceived behavioural control accounts for all the required resources and opportunities necessary to undertake behaviour, consistent with the claims of the TPB (Ajzen & Madden 1986). Subjective norms do not predict alcohol related behaviours, as do other primary variables of the TPB. Subjective norms are, however, predictive of some drinking intentions. Perceived behavioural control is a predominant attribute of consumption behaviours. In these ways the perceived behavioural control variable, as a

proxy for actual control, has potential to inform public alcohol policy and a public alcohol policy model. Taking these findings into account, the utilisation of actual control alongside perceived control in the prevention of alcohol related harms is advisable to strengthen the research foundation and facilitate improved policy outcomes. In some circumstances, such as a determination to reach intoxication, drinking intentions can be targeted in association with peer influence.

6.5 Benefits of Utilising Perceived Behavioural Control

There are significant benefits in utilising the perceived behavioural control variable for public alcohol policy and strategic intervention. When perceptions closely match reality, prediction of behaviour can, unequivocally, be achieved through perceived behavioural control (Ajzen 2002; McCaul et al. 1993). To be a valid predictor, perceived behavioural control needs to accurately reflect actual behavioural control. “The extent to which perceived behavioural control reflects actual control, it may influence behaviour directly” (Schlegel et al. 1992, p. 361). This proposition is representative of the second version of the TPB, where perceived behavioural control directly predicts behaviour irrespective of intentions (Ajzen 1991; Ajzen & Madden 1986).

According to one of the authors of the TPB, perceived behavioural control can be used as a substitute measure for actual control (Ajzen 1991), further demonstrating the power of perceived behavioural control as the only variable of the TPB able to bypass intention and predict behaviour directly. These relationships are illustrated in a study where both perceived behavioural control and low self-control show direct and significant associations with alcohol use, and bypass other predictors in the achievement of alcohol related behaviour (Higgins & Marcum 2005). The impact of these two variables on alcohol use is almost identical in the investigation. But perceived behavioural control is inversely related

to alcohol use; the lower the perception of control the greater the alcohol associated risk. Also demonstrated by Higgins and Marcum (2005) is a direct significant relationship between low self-control and perception of control. Those situations, where perception of control does not fully reflect actual control (Farrington, McBride & Midford 2000), provide opportunity for policy and intervention to support more accurate behavioural control measures and thereby reduce risky drinking.

Perceived behavioural control is important for its predictive value in high risk drinking situations (Schlegel et al. 1992). When unrealistic expectations are held about performance of behaviour, intention is a weak predictor of actual behaviour, and perceived behavioural control the better mediator overall (Ajzen 2002). A study extending the Theory of Reasoned Action (Fishbein & Ajzen 1975) to include perceived behavioural control reveals the prediction of intention declines when predictors do not correspond with the drinking environment or the type of alcohol consumed (Schlegel, Crawford & Sanborn 1977). In these situations, perceived behavioural control could exert the greater, and in some cases, the only direct influence on behaviour. Perceived behavioural control represents constraints on an action, thus further explaining why intention does not always predict behaviour (Armitage & Conner 2001). According to some authors, the effects of perceived behavioural control on intentions and behaviours may in fact be interactive (Ajzen & Madden 1986; Terry & O'Leary 1995), lending credence to the idea of functioning and dynamic systems in alcohol use and consumption behaviours (Holder 2009).

Other influences, such as past behaviour, also predict alcohol related actions (Conner et al. 1999) and therefore are of interest to public alcohol policy. The ways in which alcohol has been consumed in the past is a good indicator of present and future consumption habits.

But the longer the interval between intention and behaviour, the greater the likelihood change will occur in intention (Sutton 1998), rendering it an unreliable predictor of behaviour. In such circumstances, perceived behavioural control could have more influence than intention when some time has elapsed between the formation of intention and opportunity for behaviour. This position is supported by findings that reveal the ‘intention/behaviour’ relationship declines acutely within an explicit timeframe (Randall & Wolff 1994). According to Randall and Wolff (1994), the rapid decline in intentions with substance use behaviours is most likely due to the impact of personal and environmental control factors that change the course of proposed action.

The achievement of aimed for actions is possible with reference to perceived behavioural control, especially in situations where broken intentions are common. As confirmed in *Chapter Four*, the motivations, expectancies, perceptions and control factors that surround drinking are well represented by the TPB. In those situations where perception of control accurately represents actual control, it is predictive of behavioural achievement. In these ways perceived behavioural control can represent all of the variables of the TPB (Godin & Kok 1996) and can reliably inform alcohol outcomes and alcohol policy. An additional benefit of using perceived behavioural control as a proxy for actual control is that, while real control is reasonably constant (Ajzen 1991), perception of control can be open to change. Reductions in consumption and harms could be achieved through policy that helps drinkers to establish more accurate perceived control over alcohol, drinking environments, and associated behaviours.

6.6 Risk of Utilising Perceived Behavioural Control as a Single Predictor

Risk is inherent in the adoption of a single variable, such as perceived behavioural control, to predict intentions and behaviours and apply to public alcohol policy. Control related factors have facilitating or inhibiting effects on subsequent behaviour (Armitage & Conner 1999), making their inclusion in public alcohol policy a challenging task. This finding is consistent with a *Study of Attitudes and Behaviours of Groups at Risk* in Australia (National Drug Strategy 2002). Results show Australian drinkers perceive any consumption heavier than their own as high risk, consistent with a tendency of risky drinkers to rationalise their own drinking. Loss of control is more likely in these circumstances. According to the TPB and related findings, if alcohol related perceptions of control are inaccurate, this is a high risk situation for drinkers and those not directly involved in consumption. Unrealistic expectations develop due to the extent that ease of performance and perceived favourability of behavioural outcomes are overestimated (Ajzen 2002). These situations present a number of implications for public alcohol policy, the challenge of which is not met by current alcohol policy in Australia (National Drug Strategy 2006).

Moreover, perceived behavioural control does not, on its own, fully explain ‘binge’ drinking (Jamison & Myers 2008; Johnston & White 2003), despite low self-control exerting a significant influence on ‘binge’ drinking and alcohol problems (Piquero, Gibson & Tibbets 2002). Neither does low self-control always account for the ‘binge’ drinking phenomenon. Intention is at times the only significant predictor of heavy drinking (Glassman et al. 2008), suggesting loss of control can be intentional, consistent with the position of others (Room & Makela 2000). Friends’ drinking behaviour is also related to intention to drink alcohol and ‘binge’ drink (Jamison & Myers 2008). The norms of

relevant reference groups predict intention to 'binge' drink, particularly if the drinker identifies strongly with the reference group in question (Johnston & White 2003). But young people in particular draw a distinction between getting drunk, not considered by them to be problematic, and losing control which is negatively viewed (Farrington, McBride & Midford 2000). In these situations, drinking goals account for a distinction between a determination to get drunk and an unintentional loss of control.

Risk results from actions perceived to be under the personal control of the doer, but difficulty is experienced in undertaking the behaviour (Sparks, Guthrie & Shepherd 1997). The lack of match between perceptions and reality can generate unrealistic expectations regarding behavioural capacity and unrealistic notions of the level of control over alcohol. An inability to carry through on intentions can result from personal and environmental factors that impact on behavioural control (Randall & Wolff 1994) and perception of control. "Illusion of control can result from task familiarity and involvement, accuracy and self-enhancement motives, as well as mood with more accurate assessment possible with regards to a negative mood or when costs are high in getting it wrong" (Sheeran, Trafimow & Armitage 2003, pp. 406, 407, 408). "The greatest satisfaction of feeling of competence would therefore result from being able to control the seemingly uncontrollable" (Langer 1975, p. 323), a mantra fit for twenty-first century alcohol policy as well as for the drinkers such policy would influence.

To conclude, the likelihood of behavioural achievement is dependent upon both internal and external resources, as opportunities or impediments to intended actions, consistent with the TPB (Ajzen 1991; Ajzen & Madden 1986) and significant for public alcohol policy. There is some conjecture that actual control, rather than perceived control, exerts the direct influence on behaviour (Ajzen & Madden 1986). Moreover, where there is

sufficient behavioural control, people act on their intentions when the opportunity for behaviour arises (Ajzen 2002). In situations where there is little potential for loss of control, intention is a reliable predictor of behaviour (Ajzen 1991). In these circumstances, the TRA (Fishbein & Ajzen 1975) explains and predicts behavioural outcomes without the addition of the TPB variable of perceived behavioural control (Ajzen 1991; Ajzen & Madden 1986).

6.7 Implication of Findings for a Public Alcohol Policy Model

There are a number of implications from these findings for public alcohol policy and a public alcohol policy model. Incremental change in behaviour results from variation in perception of control, as predicted by the TPB (Ajzen 1991; Ajzen & Madden 1986).

These links are particularly salient with problem drinkers, when compared with nonproblem drinkers (Schlegel et al. 1992). Moreover, the influence of perceived behavioural control could be greatest in drinking behaviours where personal control is mediated by external influences such as physical and social availability, predisposing to risk. But perceived behavioural control is not the only influence on drinking behaviour, as determined by the TPB (Ajzen 1991; Ajzen & Madden 1986). In the research analysed, attitudes and subjective norms also have some indirect effect on behaviour through intentions.

It can therefore be concluded, from the results of the current investigation, that the TPB offers considerable advancement in understanding drinking behaviours and predicting alcohol outcomes (Bogren 2006; Kahler, Epstein & McCrady 1995; Muraven & Baumeister 2000; Muraven, Collins & Nienhaus 2002; Muraven, Tice & Baumeister 1998). The TPB provides direction for how behaviours, like alcohol consumption, can be changed through public alcohol policy and strategic intervention. As previously stated,

Armitage and Conner (2001) and Godin and Kok (1996), in their respective reviews of the literature, make no specific policy recommendations. Subsequent to their investigations, however, there is enough evidence from alcohol specific studies to support a link between the prediction of alcohol outcomes and the development of alcohol policy. With reference to these findings, it is more certain the primary variables of the TPB can inform public alcohol policy.

Findings discussed in the analysis of the chapter give rise to the likelihood of developing a public alcohol policy model with reference to the TPB. In particular perceived behavioural control sheds light on how alcohol policy approaches can be formulated; actual control contributes to the insights gained. Nonetheless, gaps are identified in TPB research. There is an absence of research of TPB constructs in the Australian drinking context, including for Indigenous communities. Only one Australian study is identified that investigates alcohol related behaviours in a TPB context (Johnston & White 2003). Nonetheless, findings from other countries provide opportunity to improve the prediction and understanding of drinking outcomes and advance the framing of public alcohol policy. Results are relevant to whole populations as well as subpopulations most at risk. Population groups experiencing diminished control may gain the most from policy that addresses behavioural control factors.

Taking into account the recommendations of the research reviewed, a number of possibilities stand out. For example, alcohol policy can aim to support safer perceptions of control and safer actual control through server intervention programs (Murgraff, McDermott & Walsh 2001) and other environmental factors, such as reducing the physical availability of alcohol and encouraging the avoidance of alcohol using peer groups (Marcoux & Shope 1997). Improving the ‘pub’ environment through the provision of

good quality food (Norman, Armitage & Quigley 2007) and a social setting conducive to conversation can also strengthen drinker control and prevent ‘binge’ drinking behaviour. These recommendations reinforce the findings of *Chapter Five* that environmental factors, including the availability of alcohol and alcohol using friends and family, exert significant influence on consumption and harms from alcohol.

The importance of media messages is also emphasised in a number of investigations. In today’s information rich society, there are an array of means to communicate important social messages to drinkers and potential drinkers alike. Self-identity as a drinker can be challenged through preventive media messages (Conner et al. 1999; Norman, Armitage & Quigley 2007). Alcohol policy and intervention, based on the TPB, can aim to portray the social costs of high consumption and support the perception of safer social norms (Hughes 2008; Norman, Armitage & Quigley 2007). These inventions can occur through a number of informative mechanisms (Higgins & Marcum 2005; Norman, Bennett & Lewis 1998). As found by Hughes and others (2008), young people can be encouraged not to drink at all, or not to drink as much, through challenging perceptions that their peers are misusing alcohol and drinking heavily. The importance of group norms and group identification (Johnston & White 2003), as well as peer influence and friends’ drinking (Jamison & Myers 2008), is apparent; this emphasis is a valuable part of public alcohol policy. Consistent with these findings, health promotion messages through media and other means can convey the social benefits of low consumption and the overall greater enjoyment of keeping within proscribed drinking limits (Murgraff, McDermott & Walsh 2001). The negative effects of drink driving are also important for media portrayal (Parker et al. 1992).

Parental discussion of media messages can help reinforce safer alcohol use and possibly reduce alcohol misuse (Marcoux & Shope 1997). Such messages, if presented in tandem within a comprehensive marketing strategy, may assist in challenging the harmful drinking behaviours so prevalent in Australia (Chikritzhs et al. 2003; National Preventative Health Taskforce 2008, 2009). Promotion of the Australian Alcohol Guidelines (National Health and Medical Research Council 2009), through media and other social marketing avenues, will provide the facts pertaining to alcohol as a popular beverage and an ‘extraordinary’ substance.

In support of the findings of *Chapter Five* related to alcohol availability, some of the studies reviewed in *Chapter Six* recommend a reduction in the availability of alcohol (Marcoux & Shope 1997) and improvements to the alcohol use environment (Johnston & White 2003; Murgraff, McDermott & Walsh 2001; Norman, Armitage & Quigley 2007; Norman, Bennett & Lewis 1998) as ways of strengthening behavioural control and improving drinking outcomes. The evidenced links between alcohol availability and consumption choices are further confirmed by the investigation of the current chapter. Findings are consistent with research of behaviours not specific to alcohol. The TPB variables inform an array of behaviour change interventions (Hardeman et al. 2002).

However, in the Hardeman and colleagues (2002) investigation, the TPB variables do not always inform the design of actual interventions; rather, they advance understanding of the behavioural change of target groups. Twelve of the twenty-four studies use the TPB for the development of interventions. But, where interventions are directly developed from the theory, the TPB is more useful in identifying cognitive targets for change rather than offering how these cognitions might be altered (Hardeman et al. 2002). The most common methods described are information, persuasion, goal setting and skill development, as well

as planning, implementation, social modelling and encouragement. Also reported is the valuable contribution of the TPB to the development of behavioural change interventions; an absence of current practice is emphasised by these authors. The discussion of this chapter extends the debate.

According to the TPB, attitudes and subjective norms do not influence behaviour directly, but rather indirectly via intentions. Consideration of the indirect impact of attitudes and subjective norms on behaviour may help prevent strategies that focus solely on these variables. Other research into past behaviour explains how drinkers arrive at consumption decisions and provides information for potential intervention (Aarts, Verplanken & van Knippenberg 1998). Health promotion activities assist drinkers in understanding the reasons and purposes behind their drinking actions (Sparks, Guthrie & Shepherd 1997) and may help engender safer alcohol use in environments where loss of control is likely. Deterrents and reinforcements are shown to be successful in altering driver related speeding behaviours and reinstating behavioural control (Stead et al. 2005). Application of these findings could be beneficial; yet, ultimate responsibility for driving behaviour and ultimate responsibility for drinking behaviour rests with the doer. Later chapters of the thesis further discuss the development of behaviour change interventions for alcohol, informed by the TPB.

6.8 A Way Forward

Findings of *Stage One* and *Stage Two* of the chapter confirm perceived behavioural control as the most reliable variable of the TPB to inform alcohol policy and related interventions. Attitudes and social norms are also relevant but exert an indirect influence on behaviours through intentions. The second iteration of the TPB (Ajzen 1991) - where perceived behavioural control bypasses intentions and directly impacts on behaviour - is the version

of the theory with most potential for alcohol policy. As previously discussed, alcohol intentions do not always translate to behaviour. But, as problems with control advance, loss of control over drinking and loss of control over life are apparent as ‘a double loss of control’ (Room 1989; Room & Leigh 1992). Actual behavioural control, if used in conjunction with perceived behavioural control, can strengthen understanding of alcohol related actions (Higgins & Marcum 2005) and provide ways to prevent and reduce alcohol associated risk.

It is confirmed that actual control and perceived control are important attributes of consumption behaviours, able to inform future alcohol policy development. These variables require a considerable focus in public alcohol policy. The variables of *actual behavioural control* and *perceived behavioural control* can likely inform a public alcohol policy model alongside the variables of *actual alcohol availability* and *perceived alcohol availability*. In some circumstances, actual alcohol availability is the most salient risk factor (Marcoux & Shope 1997), a finding supported by *Chapter Five*. The foundations of a public alcohol policy model are further established in *Chapter Seven* through combining findings related to Availability Theory (Bruun et al. 1975; Single 1988; Stockwell & Gruenewald 2001) with those associated with the Theory of Planned Behaviour (Ajzen 1991; Ajzen & Madden 1986).

Chapter 7: Alcohol Risk and Policy Perspectives

7.1 Introduction

Prior analysis of theory in *Chapters Five and Six* provides insight into the framing of public alcohol policy and suggests a future policy direction. A synopsis of findings related to alcohol availability and behavioural control is presented in this chapter. Integration of results helps define risk in the alcohol policy milieu. This occurs in relation to the theories of interest - Availability Theory (AT) (Bruun et al. 1975; Single 1988; Stockwell & Gruenewald 2001) and the Theory of Planned Behaviour (TPB) (Ajzen 1991; Ajzen & Madden 1986) - together with associated research. A theoretical perspective is sought to improve understanding of alcohol consumption and establish a foundation for future research (Holder 2009). Reference to theory helps clarify the environmental context of use and unravels the attributes of consumption behaviours. This position is in agreement with Bell, “of an emerging genre of policy relevant research that deserves an effort of study, because it has not been properly identified, theorized, and described” (Bell 2010, p. 3).

Alcohol availability and behavioural control are multidimensional concepts, as demonstrated in the literature. Availability is fundamental to alcohol consumption; behavioural control can prevent drinking altogether, or alternatively, loss of control results in heightened risk. The “dynamic nature of complex systems in which alcohol use, its physical availability, and the problems it causes” (Holder 2009, p. 577) is acknowledged. Each type of evidence has its own advantage, and each contributes to an understanding of alcohol policy (Babor et al. 2003). Alcohol availability and behavioural control vary in influence on drinking outcomes and consumption behaviours. Yet, similarities are evident. Public availability and personal control operate as protective or facilitating factors in the

alcohol use environment; risk perception and situational control provide protection from harms (World Health Organization Alcohol and Public Policy Group 2004).

Policy, addressing environmental factors and consumption behaviours concurrently, could assist in reducing population risk and help prevent harms for vulnerable drinkers.

Corresponding with such thinking, research at the aggregate level can be integrated with research at the individual level to provide the best possible advice for society (Rehm, Ashley & Dubois 1997). The dichotomy between public alcohol availability and personal behavioural control needs to be bridged for a public alcohol policy model. However, it may not be possible to amalgamate these concepts directly. Rather integration is pursued in relation to the alcohol risk environment and the alcohol policy milieu. According to d'Abbs (2004), powerful policy levers such as availability and consumption will diminish risk if applied consistently over time with strong government backing.

Reference to AT (Bruun et al. 1975; Single 1988; Stockwell & Gruenewald 2001) and the TPB (Ajzen 1991; Ajzen & Madden 1986) helps establish the most influential of policy levers for a public alcohol policy model. *'Actual alcohol availability'*, *'perceived alcohol availability'*, *'actual behavioural control'*, and *'perceived behavioural control'* are brought together and applied to alcohol risk and policy perspectives. Findings shed light on how broad contextual influences, like environmental factors, interact with the behavioural parameters of consumption. Application of theory to public alcohol policy provides a way to achieve strategic gain through changing the risk environment and altering drinkers' responses. The next section summarises the risk and harm relationships that could underpin public alcohol policy and a public alcohol policy model for Australia.

7.2 Summary of Findings (*Chapter Five and Chapter Six*)

Risk and harms from alcohol availability are primarily associated with:

- the actual availability of alcohol at the population level (Bruun et al. 1975; Single 1988; Stockwell & Gruenewald 2001);
- the aggregate population consumption of alcohol (Norstrom & Ramstedt 2005);
- the influence of the consumption of one group of drinkers on another, heavy versus medium drinkers, at the population level (Skog 1985);
- the availability of alcohol in local environments and community settings;
- the perceived availability of alcohol as relatively easy to obtain (Epstein et al. 1999; Epstein, Botvin & Diaz 1999; Jones-Webb et al. 1997; Knibbe et al. 2005; Komro et al. 2007; Kuntsche, Kuendig & Gmel 2008; Moore, Ames & Cunradi 2007; Paschall et al. 2007);
- the perceived availability of alcohol within an accessible distance (Abbey et al. 1990a, 1990b; Abbey, Scott & Smith 1993; Rabow et al. 1982); and
- the perceived availability of alcohol as relatively easy to afford and purchase (Abbey et al. 1990a; Abbey, Scott & Smith 1993; Paschall et al. 2007; Wagenaar et al. 1996).

In addition to availability related factors outlined above, the risk and harms from behavioural control are primarily associated with:

- the loss of self-control of drinkers (American Psychiatric Association 2000; Heather 1995; Higgins & Marcum 2005);
- the perceived behavioural control of drinkers (Ajzen 1991; Ajzen & Madden 1986; Higgins & Marcum 2005; Johnston & White 2003; Marcoux & Shope 1997;

McMillan & Conner 2003; Murgraff, McDermott & Walsh 2001; Norman, Armitage & Quigley 2007; Norman, Bennett & Lewis 1998; Parker et al. 1992; Schlegel et al. 1992);

- drinkers' intentions (Higgins & Marcum 2005; Jamison & Myers 2008; Johnston & White 2003; Marcoux & Shope 1997; McMillan & Conner 2003; Norman, Armitage & Quigley 2007; Schlegel et al. 1992); and
- attitudes (Higgins & Marcum 2005; Jamison & Myers 2008; Johnston & White 2003; McMillan & Conner 2003; Murgraff, McDermott & Walsh 2001; Norman, Armitage & Quigley 2007; Parker et al. 1992; Schlegel et al. 1992) and subjective norms (Higgins & Marcum 2005; Jamison & Myers 2008; Johnston & White 2003; Marcoux & Shope 1997; McMillan & Conner 2003; Parker et al. 1992; Schlegel et al. 1992), but indirectly, and to a lesser extent overall than perceived behavioural control or intentions.

7.3 Theoretical Perspectives on Alcohol Risk and Harms

Alcohol availability as determined by AT (Bruun et al. 1975), provides opportunity to consume alcohol and enables drinking to continue irrespective of drinker control, perceived control, or intentions as explained by the TPB (Ajzen 1991; Ajzen & Madden 1986). Yet, neither AT or the TPB can entirely predict the choices made within a drinking session. These theories cannot fully account for the point in a drinking episode at which 'determined drunkenness' becomes uncontrolled consumption. Even so, the issue of control, both control of availability and control of behaviour, is central to both theories. The sections to follow summarise relationships of the primary variables of focus. The step is undertaken to inform public alcohol policy and a public alcohol policy model for Australia.

7.3.1 Actual Availability: relationships with risk and harms

At the population level, *actual alcohol availability* in conjunction with aggregate consumption is associated with population risk and harms such as:

- i. all-cause mortality, liver cirrhosis and other diseases, suicide, accidents and homicide (Norstrom 2001; Norstrom & Ramstedt 2005);
- ii. liver cirrhosis mortality (Ramstedt 2001b);
- iii. sickness absence for males (Norstrom 2006);
- iv. suicide (Ramstedt 2001a, 2005); and homicide (Rossow 2001); and
- v. overall accident mortality (Skog 2001b), fatal motor vehicle traffic accidents, accidental falls and other accidents (Skog 2001a).

Gradations in availability and harms are reflected in the movement of aggregate consumption up and down the consumption scale (Skog 1985). A continuum of availability and consumption (Bruun et al. 1975), together with a continuum of alcohol related risk (Chikritzhs et al. 2003; National Health and Medical Research Council 2009), suggests an approach for public alcohol policy and a public alcohol policy model. Findings indicate by reducing the actual availability of alcohol to more tolerable levels, population benefits will result. Restrictions on situational availability complement these gains.

Situational availability is associated with risk and harm related indicators such as:

- i. the distance travelled to obtain alcohol (Huckle et al. 2008; Rush, Gliksman & Brook 1986);
- ii. alcohol outlet density (Huckle et al. 2008; Livingston, Chikritzhs & Room 2007; Moskowitz 1989; Single 1988; Smith 1983; Stockwell & Gruenewald 2001; Zhu, Gorman & Horel 2004);
- iii. hours and days of sale (Moskowitz 1989; Stockwell & Gruenewald 2001);
- iv. legal drinking age (Moskowitz 1989; Smith 1983; Stockwell & Gruenewald 2001);
- v. alcohol supply to young people, commercially and in the home (Dent, Grube & Biglan 2005; Forster et al. 1995; Komro et al. 2007); and
- vi. demand for alcohol in Indigenous communities (Duncan 2011; Kinnane et al. 2009; The Drug and Alcohol Office Western Australia & the University of Notre Dame Australia Broome Campus 2010).

Social availability is associated with the:

- i. sociability of drinkers (Rabow et al. 1982);
- ii. social stratification of drinking outlets (Gruenewald 2007);
- iii. surrounding of one's self with likeminded heavy drinkers (Abbey, Scott & Smith 1993);
- iv. amount drinkers consume (Abbey et al. 1990a, 1990b; Abbey, Scott & Smith 1993);
- v. choice of a drinking location and social contacts of at risk populations (Gruenewald 2007); and
- vi. sense of obligation to serve alcohol, drinking for social reasons, and friends' and co-workers' drinking (Abbey et al. 1990a, 1990b).

Economic availability is associated with:

- i. the price of an alcoholic drink in relation to disposable income (Gruenewald, Millar & Treno 1993; Stockwell & Gruenewald 2001).

7.3.2 Perceived Availability: relationships with risk and harms

Adding to the significance of actual availability to risk and harms from alcohol, *perceived alcohol availability* is associated with the following:

General Alcohol Consumption

- i. amount consumed, largest amount consumed (Abbey et al. 1990a, 1990b);
- ii. frequency of drinking (Abbey et al. 1990a, 1990b; Abbey, Scott & Smith 1993);
- iii. alcohol use over the past thirty days (Komro et al. 2007; Lipperman-Kreda, Paschall & Grube 2009; Paschall et al. 2007; Stanley, Henry & Swaim 2011);
- iv. frequent purchase, prevalence of drinking (Ahlstrom & Huntanen 2007); and
- v. alcohol use, more frequent use, problems with peers, social contacts and adverse events (Knibbe et al. 2005).

Heavy Drinking, 'Binge' Drinking, Intoxication and Drunkenness

- i. heavy drinking (Abbey, Scott & Smith 1993; Paschall et al. 2007);
- ii. heavy drinking, drinking frequency (Rabow et al. 1982);
- iii. higher consumption, 'binge' drinking (Jones-Webb et al. 1997; Knibbe et al. 2005);
and
- iv. prevalence of drunkenness (Komro et al. 2007).

Gender Specific Risks

- i. intoxication in girls (Branstrom, Sjostrom & Andreasson 2008);
- ii. higher consumption for males (Jones-Webb et al. 1997); and
- iii. experimental drinking, amount consumed per occasion, future drinking, with specific effects for girls and boys (Epstein et al. 1999; Epstein, Botvin & Diaz 1999).

Commercial Supply, Work Access and Home Access

- i. sources of alcohol use: obtaining alcohol commercially from persons twenty-one years and over, and under twenty-one years of age (Wagenaar et al. 1996);
- ii. commercial sales, past thirty-day drinking, heavy drinking (Paschall et al. 2007);
- iii. drinking in public settings, going out without parental knowledge, poor parental modelling, 'on premise' density, drinking siblings and peers (Kuntsche, Kuendig & Gmel 2008);
- iv. student past month use (Komro et al. 2007); and
- v. after work drinking at a naval base (Moore, Ames & Cunradi 2007).

7.3.3 Actual Behavioural Control: relationships with risk and harms

Associations are evident between *actual behavioural control* and risk and harms from alcohol. Fluctuations in behavioural control are conceded in response to presenting environmental factors and predominant personal circumstances. Population groups most vulnerable to diminished control include:

- i. heavy drinkers (Room & Leigh 1992);
- ii. dependent drinkers (Caetano 2002; Heather 1995; Jellinek 1952; Julien 1995; Ludman, Yucel & Pantelis 2004; West 2006; World Health Organization 1992);

- iii. 'binge' drinkers (Engineer et al. 2003; Marczinski, Combs & Fillmore 2007);
- iv. those who drink to intoxication (Marczinski, Combs & Fillmore 2007);
- v. social drinkers with other control issues (Muraven, Collins & Nienhaus 2002; Muraven et al. 2005);
- vi. children of alcoholics (Chassin & Barrera 1993; Murray, Clifford & Gurling 1983; Schuckit 1987);
- vii. drinkers with combined mental health and alcohol and other drug problems (Lejoyeux et al. 1999; Sonne et al. 2003);
- viii. Indigenous Australians, particularly those in outback communities (d'Abbs 2001; Hall, Hunter & Spargo 1993; Hunter, Hall & Spargo 1992);
- ix. pregnant women unable to cease drinking despite the risks to their unborn child (Smith et al. 1987); and
- x. young people in general, but particularly young males (Martin et al. 2000; Wills, Ainette & Mendoza 2007; Wills et al. 2006).

Similar subpopulations are reported as vulnerable to alcohol associated risk in Australia (Australian Institute of Health and Welfare 2005b; National Drug Strategy 2001b; National Health and Medical Research Council 2009). Psychological differences between drinking categories are acknowledged (Schlegel et al. 1992); these help explain some of the vulnerabilities to risk. Consistent with the TPB, behavioural control can be viewed as a continuum from entirely volitional to entirely nonvolitional (Ajzen & Madden 1986). The continuum of behavioural control suggests an approach for public alcohol policy and a public alcohol policy model. Findings indicate that strengthening actual behavioural control will benefit drinkers, particularly those population groups most at risk from alcohol.

7.3.4 Perceived Behavioural Control: relationships with risk and harms

Adding to the significance of actual behavioural control to risk and harms from alcohol, *perceived behavioural control* is associated with:

- i. drinking intentions (Johnston & White 2003; Marcoux & Shope 1997; McMillan & Conner 2003; Norman, Armitage & Quigley 2007; Schlegel et al. 1992);
- ii. adherence to low risk single occasion drinking (Murgraff, McDermott & Walsh 2001);
- iii. a range of alcohol use scenarios encompassing past behaviour, misuse, frequency of use, low self-control and alcohol use (Conner et al. 1999; Higgins & Marcum 2005; Marcoux & Shope 1997; McMillan & Conner 2003);
- iv. ‘binge’ drinking (Johnston & White 2003; Norman, Armitage & Quigley 2007; Norman, Bennett & Lewis 1998);
- v. problem drinking and drunkenness (Schlegel et al. 1992); and
- vi. drinking and driving (Parker et al. 1992).

7.4 Integrated Policy Perspectives on Alcohol Risk and Harms

The key variables of focus predict and explain alcohol related situations of relevance to public alcohol policy and a public alcohol policy model. These circumstances include: environmental factors; alcohol supply, demand, access and affordability; alcohol related diseases, conditions, accidents and injury; social factors; subpopulations at risk; drinking intentions and consumption behaviours. Actual availability is an important influence on harms at population and situational levels; perceived availability is also significant. An increase in aggregate per capita consumption affects the drinking of moderate and heavy drinkers much more than light drinkers, or abstainers; risk from consumption eventually

outstrips the volume of alcohol consumed (Makela 2002). The adverse consequences of alcohol are primarily experienced in population groups most exposed or susceptible to risk (Single 1988); circumstances indicate other factors at play. As one explanation, vulnerable categories of drinkers experience risk differently due to variations in routine drinking activities (Stockwell & Gruenewald 2001). These drinkers may drink more often with others who are similarly at risk and be influenced to a greater extent by social pressures. Making vulnerable drinkers a focus of public alcohol policy is consistent with meeting the needs of those most at risk (Marlatt & Witkiewitz 2002).

Further interrelationships are crucial to a public alcohol policy model. The ability to cope with alcohol is dependent upon the extent of alcohol available in the environment (Bruun et al. 1975; Single 1988; Stockwell & Gruenewald 2001) as well as drinkers' practice of control (Muraven, Baumeister & Tice 1999). In these ways the behavioural attributes of consumption explained by the TPB (Ajzen 1991; Ajzen & Madden 1986) complement the population based validity of AT (Bruun et al. 1975). The influence of perceived behavioural control is significant in drinking mediated by external circumstances like environmental availability (Marcoux & Shope 1997) and internal processes like low self-control (Higgins & Marcum 2005). A response to an environmental stimulus, such as alcohol, depends on its inherent properties as well as an individual's cognitive appraisal of the 'controllability' of the stimulus (Volpicelli 1987). If drinkers have successfully avoided losing control in the past, behavioural control is more likely, irrespective of presenting circumstances. Additionally, the more resources and opportunities individuals believe they possess, and the fewer obstacles anticipated, the greater the perceived control of behaviour (Ajzen 1991).

Despite a paucity of research into the effects of alcohol availability on behavioural control in Australia, impaired control remains fundamental to alcohol risk and harms (American Psychiatric Association 2000), and vital for alcohol policy. Control of behaviour is important to the motivation of drinkers, as well as to the level of risk experienced from use (Heather 1995). Control based motives include to achieve a sense of mastery over life events (Wills et al. 2006) and over alcohol consumption (Bogren 2006), or conversely, a behavioural intention to lose control (Room & Makela 2000). Those in treatment populations worry more about self-control than the general population of drinkers; but loss of control is strongly related to heavy drinking in both these groups (Heather 1995; Room & Leigh 1992). Loss of control of alcohol, once intake has commenced, is an inherent risk associated with consumption (Nagoshi 1999).

Preventing loss of control through alcohol policy relies on limiting availability and consumption and strengthening behavioural control. Loss of control is associated with the level of alcohol use (Nagoshi 1999); when alcohol consumption increases, self-control decreases (Kahler, Epstein & McCrady 1995). This is understandable, given that the inherent properties of alcohol elicit disinhibition and loss of control (Leigh 1987; Marczinski, Combs & Fillmore 2007). Yet, uncontrollable events can lead to the consumption of alcohol in order to regain control (Volpicelli 1987). Witnessing a distressing event could lead to alcohol use; unintentional loss of control may result. Nonetheless, loss of control is a goal for some categories of drinkers, rather than an accidental occurrence (Room & Makela 2000).

The decisions made throughout a drinking episode are crucial to drinking outcomes as well as to alcohol policy. Resisting the urge to drink lessens self-control strength and undermines self-control performance (Muraven & Shmueli 2006). But, as long as alcohol

is available, consumption and loss of control are possible. With enough encouragement from fellow drinkers, most people can be persuaded to consume at least another drink. As volitional control decreases, perceived behavioural control becomes more useful as a predictor; perceptions are of greater psychological import than actual control (Ajzen 1991; Ajzen & Madden 1986). According to the research of this thesis, the primary variable of 'perceived behavioural control' exerts considerable influence on drinking outcomes alongside 'actual behavioural control'. Additionally, low self-control, as a behavioural trait, strongly effects consumption (Higgins & Marcum 2005).

Further explaining the collective influence of alcohol availability and behavioural control, 'binge' drinking partly results from external pressures in drinking environments over which little control is perceived (Norman, Armitage & Quigley 2007). In addition, the greater the intoxication from unmitigated drinking, the less accurate perceived control becomes (Norman, Bennett & Lewis 1998; Schlegel et al. 1992). Those that 'binge' drink are less likely to think they can control their alcohol intake (Norman, Bennett & Lewis 1998). Estimation of control can be quite inaccurate, but with high personal costs of getting it wrong, the accuracy of prediction is greatest (Sheeran, Trafimow & Armitage 2003). Low self-control, as disinhibition, can result directly from the effects of alcohol consumption (Collins 1993). Loss of control accounts for some variation in drinker behaviour, including those who 'binge' drink (Marczinski, Combs & Fillmore 2007). Of importance to alcohol policy, perceived behavioural control is differentially predictive for 'nonproblem' when compared with 'problem' drinkers (Schlegel et al. 1992).

Yet, loss of control and access to alcohol are unable to fully predict all drinking behaviours when intoxication is deliberately sought. With this type of drinking, intentions have an influence (Glassman et al. 2008), alongside attitudes and social norms (Jamison & Myers

2008; Johnston & White 2003). Drinkers can determine to seek out alcohol and undertake consumption to risky levels, irrespective of access difficulty. In heavy drinking populations, loss of behavioural control has strong links with risk and harms from alcohol (Room & Leigh 1992). In the Australian drinking context, intention to ‘binge’ drink is prevalent, and is predicted through the perception of behavioural control (Johnston & White 2003).

7.5 Establishing Public Alcohol Policy Parameters for Australia

Based on population data, no threshold exists where it can be assumed no risk will occur. Rather, increasing consumption is associated with increasing levels of alcohol associated risk (National Health and Medical Research Council 2009). From analysis of the literature it is evident that *the greater the actual availability of alcohol and the stronger the perceived availability of alcohol*, the more prevalent are the associated risks and harms (Chapter Five). Analysis of the literature also reveals that *the lesser the behavioural control of drinkers and the weaker the perceived behavioural control of drinkers*, the more harmful are the risks and consequences associated with consumption (Chapter Six). These are important findings to help inform public alcohol policy and a public alcohol policy model.

Consistent with the concept of a continuum of both alcohol availability (Skog 1985) and behavioural control (Ajzen & Madden 1986), it could be possible to modify these influences by means of a public alcohol policy model. Even so, “models of how research may act to shape policy are unlikely to offer an all-encompassing theory of what could happen in any one policy making context” (Bell 2010, p. 10). But, in agreement with Pang (2007), strategic policy approaches require innovation in policy formulation. Taking these

positions into account, together with interpretation of the evidence analysed in previous chapters, new policy directions are envisaged.

7.5.1 The Alcohol Environment in Australia

Contrary to what evidence suggests is the most effective policy position, Australia maintains a high level of alcohol availability. The drinking environment represents a risk for low behavioural control. The Australian alcohol market is thought to be saturated (Gough 2010). Consequently, little effort and low relative cost is required to access alcohol. Consumption occurs at high levels of risk and harms across the population (Begg et al. 2003; Chikritzhs et al. 2003), and for vulnerable drinkers (Australian Institute of Health and Welfare 2005b; National Drug Strategy 2001b; National Health and Medical Research Council 2009). Availability and harms in Indigenous communities are cause for particular concern (Duncan 2011; Kinnane et al. 2009; The Drug and Alcohol Office Western Australia & the University of Notre Dame Australia Broome Campus 2010).

Yet, a dichotomy is apparent in the perceptions of Australian drinkers. In a *Study of Attitudes and Behaviours of Drinkers At Risk* (National Drug Strategy 2002), low risk drinking is characterised by having only one glass of wine with a meal, having one or two drinks at the ‘pub’ and then going home, knowing your own limits, never getting drunk or appearing drunk, not mixing different types of drinks or mixing alcohol with medications, always eating when drinking, and having alcohol free days; high risk drinking is thought to be associated with the extremes of violence, alcohol poisoning, and death. Drinkers in Australia classify themselves primarily as social drinkers, with limited perception of the inherent risks associated with general consumption (Fynes-Clinton 2010). High risk drinkers rationalise their consumption behaviour; heavy drinkers adopt a more lenient view of what constitutes alcohol related risk. Even so, rating for risk differs when applied to

one's self, one's family, and people in general, with rating for general risk much higher than that of particular and personal risk (Sjoberg 2000). These subjective assessments are likely influenced by the normalisation of alcohol use in Australia, but more importantly, an ineffectual public alcohol policy response that has failed to reduce availability and consumption to lower risk levels.

7.5.2 Limitations of Current National Alcohol Policy in Australia

The Australian drinking environment is largely due to the direction of current strategic alcohol policy (National Drug Strategy 2006). A sociocultural focus within a harm reduction emphasis limits the scope and efficacy of strategies for alcohol. Alcohol is not necessarily viewed as a problematic product in this country; rather, the culture surrounding excessive drinking is seen as cause for concern. Intoxication gains disproportionate attention in national alcohol policy approaches, sometimes defined as 'extreme' drinking, an industry developed term (International Center for Alcohol Policies 2009). Strategies aimed at reducing alcohol availability and consumption are minimal. The change to drinking culture sought by the current National Alcohol Strategy has not been achieved.

The following analysis applied to the current *National Alcohol Strategy* (National Drug Strategy 2006) indicates a number of limitations, based on the findings of this thesis:

- A declaration of the National Alcohol Strategy is to ‘seek evidence’ (National Drug Strategy 2006) – reference to theoretical evidence is missing;
- The primary goal is to prevent and minimise alcohol related harm – limits to availability and a reduction in population consumption are not systematically pursued;
- A stronger indication of intended actions is required for availability, such as:
 - i. ‘strengthening’ price related levers - not just ‘investigating’;
 - ii. ‘restricting’ alcohol promotions - not just ‘monitoring and reviewing’;
 - iii. ‘applying legislative controls on alcohol’ - not just ‘examining the legal aspects of alcohol availability’; and
 - iv. ‘applying further restrictions on availability’ - not just ‘developing safer and healthy drinking cultures’;
- Strategic aims focus primarily on one pattern of drinking - *intoxication* and its consequences – reduction in the *level* of overall consumption and change to other harmful drinking patterns are excluded as policy aims;
- Priority areas are similarly restricted to intoxication and public safety and amenity, with a weak attempt at addressing availability in the context of cultural place;
- Perceived availability, as an important policy lever, is not included as a strategic focus;
- Loss of behavioural control and perceived behavioural control are not targeted as behaviours that require a substantial policy focus.

The areas of the *National Alcohol Strategy* (National Drug Strategy 2006) that *do* reflect the research undertaken in this thesis are:

- i. an aim ‘to improve health outcomes among all individuals and communities affected by alcohol consumption’;
- ii. a stated action ‘to strengthen the regulation of alcohol availability including liquor licensing controls’; and
- iii. an acknowledgement of intoxication as a drinking pattern in need of policy attention.

If the limitations of current policy (National Drug Strategy 2006) were to be confronted, the harms from alcohol would be better addressed. Yet, if the current direction prevails in future iterations of alcohol policy in Australia, the level of risk and harms from alcohol will likely continue. A form of alcohol related ‘genocide’ could occur for at least one generation of drinkers in Australia experiencing high levels of morbidity and mortality (Begg et al. 2003) and ongoing risk from alcohol consumption (Chikritzhs et al. 2003; National Health and Medical Research Council 2009). Altering this situation is an enormous challenge for future alcohol policy and a public alcohol policy model. With high availability, drinkers easily maintain their supply of alcohol and generally consume alcohol when and where they please. There are very few restrictions on use.

Within this policy milieu, loss of control is apparent, with risky drinking at high levels of prevalence and harms trending in accord with consumption levels (Australian Institute of Health and Welfare 2011; Chikritzhs et al. 2003; National Drug Research Institute 2009; National Preventative Health Taskforce 2008). If Australian governments fail to limit availability to more moderate levels of access, vulnerable drinkers will continue to experience high levels of harm. These circumstances create high risk for drinkers and

others, representing the unintended consequences of current alcohol policy (National Drug Strategy 2006). Associated costs are unsustainable (Alcohol Education Research Foundation & Turning Point 2010; Collins & Lapsley 2008). Alcohol policy facilitating high population and situational availability and low behavioural control, particularly for vulnerable population groups, is unacceptable. Under such a framework, alcohol harms are unlikely to reduce; an increase in harms is a possibility. Risk is inherent for the alcohol policy system in that governments are not seen to be doing enough to reverse the situation. Change is needed.

7.6 Future Policy Perspectives for Alcohol Risk and Harms

Most Australian drinkers would likely prefer alcohol availability to continue at high levels and their manner of drinking not to change; demand for alcohol is enduring in this country. A majority of drinkers will continue to drink to high levels of intoxication and risk on at least a number of occasions throughout a year. Many drinkers intentionally drink to get drunk (Room & Makela 2000). The enormity of risk, harms, and costs from alcohol demands an effective policy response. Improved strategic planning is necessary for alcohol, and strong commitment by governments to reduce the harms from use.

A new policy model is needed, one that utilises findings from Availability Theory (AT) (Bruun et al. 1975) and the Theory of Planned Behaviour (TPB) (Ajzen 1991; Ajzen & Madden 1986). The ways in which theoretical concepts inform alcohol policy and strategic intervention require clarification. According to the integration of evidence pursued in this thesis, alcohol policy in Australia can aim to achieve a better balance between maintaining the availability of alcohol as a legal product, and the health, social and economic costs associated with consumption. According to theory, the environmental

context of use and the behavioural attributes of consumption could help inform this need.

The following public alcohol policy focus is proposed:

- i. limit actual alcohol availability;
- ii. modify perceived alcohol availability;
- iii. strengthen actual behavioural control; and
- iv. modify perceived behavioural control.

A model for public alcohol policy in Australia, incorporating these objectives, is urgently needed so the risk and harms from alcohol can be lowered to more acceptable levels. “To be effective much government policy involves changing behaviours and cultures, and research that fails to account for its assumptions about people is likely to lead to failed policies” (Bell 2010, p. 10). Even so, the relationships between alcohol availability and consumption, as determined by AT (Bruun et al. 1975; Single 1988; Stockwell & Gruenewald 2001); and the variables that contribute to behavioural control, as explained by the TPB (Ajzen 1991; Ajzen & Madden 1986); hold many of the answers for strong public alcohol policy and the possibility of substantial ‘cultural change’ surrounding alcohol. Relevant theories, other than AT and the TPB, are also important in as much as they support or challenge the conceptualisation of an evidence informed public alcohol policy model.

Chapter 8: The ‘PRACTISE’ Model of Acceptable Levels of Risk

8.1 Introduction

Chapter Eight builds on the findings related to Availability Theory (AT) (Bruun et al. 1975) and the Theory of Planned Behaviour (TPB) (Ajzen 1991; Ajzen & Madden 1986) to develop a public alcohol policy model for Australia. The previous chapter identified the problems with current national alcohol policy; this chapter seeks a new alcohol policy frame. Combining alcohol availability and behavioural control in alcohol policy could help modify risk from very liberal availability and too little behavioural control. “The challenge for the next generation of scholarship is to develop and test explanatory theories of the middle range” (Goggin et al. 1990, p. 15). Integration of alcohol availability and behavioural control rests on its genesis in AT (Bruun et al. 1975) and the TPB (Ajzen 1991; Ajzen & Madden 1986), extends to the prevention of alcohol associated risk (National Health and Medical Research Council 2009), and then to public policy contexts.

Addressing the primary components of alcohol risk could not only benefit those of the population struggling with the consequences of use but also enable a realistic level of access to alcohol as a legal product. Within an integrated policy framework, is it possible to address values and priorities in more congruent ways than currently occurs in Australia. This position is argued as the most functional and achievable aim, given the prevailing political and policy circumstances and the popularity of alcohol with most of the population. But balance in policy can be difficult to achieve (Ritter 2010). The *Policy ‘Risk appraisal’ of Availability and Control to Increase Strategic Effectiveness (PRACTISE) Model*, here developed, pursues this aim.

Political opponents and alcohol policy groups usually view the problems and solutions associated with alcohol from a number of differing policy perspectives, dependent on political allegiance, personal preference, or a reliance on research findings. Attention is drawn to associations between ambiguity and conflict in policy implementation and unclear policy goals (Hill & Hupe 2009; Matland 1995). Governments are unsure of what level of alcohol availability is safest for the community, the best ways to prevent risky drinking, and how to manage the impact of alcohol restrictions on business, trade, employment and economic development. Where alcohol policy aims are not clearly conceptualised or articulated, interpretation is equally uncertain, resulting in disjointed policy action. A government focus on the 'PRACTISE' Model could provide a level of change to alcohol policy processes and associated policy direction.

High levels of population availability and the prevalence of uncontrolled consumption are argued as the key drivers of alcohol harms in Australia. Perceptions of alcohol as readily available and perceptions of behavioural control as lacking, add to the risk. In these circumstances, supply and availability of alcohol are not expected to decrease without reduced demand, as determined by Supply and Demand Theory (Klein 1988; Marshall 2009). Lower demand can be achieved through increased behavioural control as well as perceptions of control more responsive to risk. Nonetheless, behavioural control may not be strengthened without limited availability, reduced perceived availability, and increased perceived control. Synergies are evident between perceived and actual availability and perceived and actual behavioural control. This thinking is consistent with perspectives that emphasise the multidimensional properties of risk perception (Sjoberg 2000).

Collective influences compound alcohol associated risk. When alcohol is available, risk may be discounted and control of consumption wrongly assumed. As an example, the level of intoxication and loss of control apparent at the end of race days, such as the Australian ‘Melbourne Cup’, is in contrast to the well dressed and ‘in control’ attendees arriving at such events. Yet, if alcohol availability is perceived as a risk in itself, a more accurate assessment of behavioural control could facilitate drinker caution. Harms are then less likely. Other influences, like good parental guidance (Kuntsche, Kuendig & Gmel 2008), provide protection from risk for young people; those whose parents are willing to set clear boundaries and collect them early from parties where alcohol is served may be more likely to drink responsibly. It is acknowledged that drinkers who are highly dependent are determined to consume alcohol (American Psychiatric Association 2000), irrespective of the use environment or the impacts on personal behaviour.

8.1.1 Summary of Theoretical Perspectives on Risk and Harms

To reiterate, *actual alcohol availability* and *perceived alcohol availability* act as mediators of risk, as do *actual behavioural control* and *perceived behavioural control*. *Table Seven* summaries these relationships in preparation for a public alcohol policy model for Australia.

Table 7: Theoretical Perspectives on Alcohol Risk and Harms

Actual Alcohol Availability: Population and Situational	Perceived Alcohol Availability: Drinking Circumstances
<p><i>Actual population availability accounts for variation in per capita consumption and population harms -</i></p> <p>Consumption:</p> <ul style="list-style-type: none"> • Per capita consumption in litres of pure alcohol. <p>Aggregate Harms:</p> <ul style="list-style-type: none"> • All-cause mortality; • Sickness absence; • Liver cirrhosis and other diseases; • Suicide and homicide; • Overall accident mortality, fatal motor vehicle traffic accidents, accidental falls. <p><i>Actual situational availability is associated with -</i></p> <p>Supply/Access:</p> <ul style="list-style-type: none"> • Hours and days of sale; • Density of alcohol outlets; • Distance travelled to purchase and/or consume alcohol; • Legal drinking age; • Public and home supply of alcohol to young people; • Alcohol related harms in Indigenous communities; • Settings and venues in which to purchase and/or consume alcohol; • Social stratification of drinking outlets. <p>Economic Availability:</p> <ul style="list-style-type: none"> • Price of an alcoholic drink for potential consumers. <p>Related Social Factors:</p> <ul style="list-style-type: none"> • Sociability of drinkers; • Surrounding one's self with heavy drinkers; • Amount drinkers consume; • Choice of drinking location and social contacts with at risk populations; • Sense of obligation to serve alcohol; • Drinking for social reasons; • Friends' and co-workers' drinking. 	<p><i>Perceived availability accounts for significant variation in demand for alcohol -</i></p> <p>Demand/Source:</p> <ul style="list-style-type: none"> • The amount drinkers purchase; • Frequency of purchase and consumption; • Distance travelled to purchase alcohol; • Convenience of obtaining alcohol; • Sources of alcohol; • Commercial access and district sales rates; • Drinking in public places and 'on premise' density; • Some aspects of work related drinking; • Young people's public access and home supply. <p>Consumption:</p> <ul style="list-style-type: none"> • Drinking prevalence; • Monthly alcohol use; • Level of alcohol consumption; • Heavy drinking; • 'Binge' drinking, intoxication and drunkenness; • Gender specific risks. <p>Economic Affordability:</p> <ul style="list-style-type: none"> • The cost of purchase of alcohol in relation to income. <p>Related Social Factors:</p> <ul style="list-style-type: none"> • Poor parental modelling; • Drinking siblings and peers; • Problems with peers and other social contacts; • Adverse alcohol related events.

Actual Behavioural Control: Volitional and Nonvolitional	Perceived Behavioural Control: Consumption Behaviours
<p><i>Loss of behavioural control accounts for consumption, risk and harms in vulnerable groups -</i></p> <p><i>Subpopulations at Risk:</i></p> <ul style="list-style-type: none"> • Heavy drinkers; • Dependent drinkers; • ‘Binge’ drinkers; • Children of alcoholics; • Drinkers with combined mental health and alcohol/other drug problems; • Those who drink to intoxication; • Social drinkers with control issues; • Indigenous Australians in outback communities; • Pregnant women unable to cease drinking; • Young people in general, and in particular, young males. 	<p><i>Perceived behavioural control accounts for significant variation in drinking behaviours -</i></p> <p><i>Consumption:</i></p> <ul style="list-style-type: none"> • Alcohol use; • Adherence to low risk drinking guidelines; • Alcohol misuse; • ‘Binge’ drinking; • Frequency of use; • Frequency of getting drunk for problem drinkers; • Low self-control; • Past behaviour; • Improvement of drinking outcomes. <p><i>Perceived behavioural control predicts intentions for:</i></p> <ul style="list-style-type: none"> • Alcohol use; • ‘Binge’ drinking; • Determination to get drunk for nonproblem drinkers; • Drink driving. <p><i>Intentions</i> together with perceived behavioural control contribute to the prediction of consumption in the following circumstances:</p> <ul style="list-style-type: none"> • Determined ‘binge’ drinking; • Intentional drunkenness. <p><i>Also important to consumption behaviours are -</i></p> <p><i>Related Social Factors:</i></p> <ul style="list-style-type: none"> • Social and subjective norms.

Evidence, summarised in *Table Seven*, reveals that the various dimensions of alcohol availability and behavioural control do not function in isolation. All interrelate with access, supply, demand, source, affordability, social factors, intentions, consumption, drinking outcomes, and of course risk. All contribute to the progression of alcohol associated harms. A policy model that successfully integrates public alcohol availability and personal behavioural control could advance the ways alcohol risk is prevented and harms reduced. A model that encompasses perceptions could bring additional gain, where not only alcohol availability and behavioural control receive attention, but subjective assessments are a focus as well. Development of this type of policy frame requires change to alcohol policy conceptualisation and alcohol associated risk. “The management of risk by policy makers presents them with a very considerable challenge: change brings risk, but so does not changing” (Bell 2010, p. 34).

8.2 Foundations of a Public Alcohol Policy Model

8.2.1 New Public Alcohol Policy Directions for Australia

New directions need to be established to solve longstanding alcohol problems. The concept of ‘challenging the status quo’ is important to the policy debate to alter the thinking around a public problem, raise the focus of decision makers, and provide new policies and interventions (Weiss 1977). Of relevance to alcohol policy is the definition of a tolerable daily intake of a food or substance that can occur over a lifetime *without appreciable health risk* (Department of Health and Ageing and Health Council 2002). This description reflects the notion that risk and harms can be kept to manageable levels through a restrained approach to both access and consumption. The Australian Alcohol Guidelines are a good source of information for drinkers’ exposure to risk, where relative risk is linked to incremental levels of consumption (National Health and Medical Research

Council 2009). In order to reduce risk, the concept of an acceptable level of alcohol associated risk is pursued for a public alcohol policy model.

A policy synergy between alcohol availability and behavioural control could facilitate a reduction in risk. This position concurs with others, in support of achieving a balance between alcohol availability, consumer demand, and health and safety concerns (Stockwell & Gruenewald 2001). The current constraints on achieving large reductions in alcohol availability, as well as the consequences of not changing drinker control to safer levels, are acknowledged. In environments that are fundamentally imbalanced, individuals often take rather than avoid risks (Hoek & Jones 2011).

But interventions targeting alcohol availability and behavioural control will not address all aspects of risk. As demonstrated throughout this thesis, connections between alcohol availability and behavioural control are complex, subject to a range of internal and external influences. A way of increasing the effectiveness of policy that would limit alcohol availability is vital. Perceived availability is associated with consumption factors such as: demand, sources of alcohol, purchase of alcohol, levels and patterns of use, and related social indicators. Modifying perceptions of availability in ways conducive to diminished risk is essential to the prevention of alcohol harms, alongside policy and interventions to reduce actual availability. Perceived availability accounts for significant variation in alcohol demand.

A way of increasing the efficacy of behavioural control strategies in public alcohol policy is important. Behavioural control is a variable resource, subject to temporary depletion through constant exertion (Muraven, Tice & Baumeister 1998), or able to be strengthened through long term practice (Muraven, Baumeister & Tice 1999). Other research shows behavioural control carries a range of meaning and potential outcomes in relation to

different styles of drinking and different drinking settings (Bogren 2006). A reduction in strategic impact could result if behavioural control is singularly addressed in alcohol policy. Perceived behavioural control is significant to change in consumption related factors, drinking intentions, drinking behaviours, and social circumstances. Modifying perceived behavioural control in ways conducive to safer consumption is essential, alongside policy and interventions focusing on actual behavioural control. Perceived behavioural control accounts for significant variation in drinking behaviours.

A public alcohol policy model can aim to reduce alcohol availability to more limited access. Multiple levels of availability are acknowledged (Skog 1985); fluctuations are also conceded. In addition, an alcohol policy model can aim to modify perceived availability conducive to lower risk. An alcohol policy model can also aim to strengthen behavioural control. Drinking behaviours range from entirely volitional to entirely nonvolitional; self-control is a continuous construct (Ajzen & Madden 1986). Multiple expressions of control are acknowledged consistent with an understanding of self-directed behaviour. In addition, a policy model can aim to modify perceived behavioural control. Within these parameters, acceptable risk may be more realisable. An aim of more acceptable risk could inform the frame and structure of future public alcohol policy for Australia. It remains to be seen if this can be achieved in reality; a theoretical perspective would suggest so.

8.3 A New Public Policy Frame: The Alcohol ‘PRACTISE’ Model

This thesis presents as its central contribution, a new public policy framework for reducing risk in the alcohol policy environment. The *Policy ‘Risk appraisal’ of Availability and Control to Increase Strategic Effectiveness (PRACTISE) Model* is intended to achieve strong public alcohol policy outcomes for Australia. In the Model, the achievement of safer behavioural control on the part of drinkers offsets the absence of overly strict controls on alcohol. As shown by experience in other countries, strong restrictions are not the most effective policy response (Fitzgerald & Jordon 2009). According to the Model, the variables of ‘perceived alcohol availability’ and ‘perceived behavioural control’ are essential to public alcohol policy, alongside ‘actual alcohol availability’ and ‘actual behavioural control’. This integrated policy position represents an original contribution to the alcohol research and public policy fields.

Perceived alcohol availability and perceived behavioural control are important components of the ‘PRACTISE’ Model. Perceptions are the lens through which drinkers discern the alcohol use environment, choose a potential behavioural response, and appraise alcohol associated risk. Perceptions are noteworthy; they represent the main cognitions preceding consumption as demand for alcohol. Perceptions vary according to external and internal influences such as the amount of alcohol available for consumption and the level of behavioural control of use. A challenge for alcohol policy is to support the accuracy of perceptions in pursuit of reduced risk and safer drinking practices. Policy measures that ensure safer behavioural responses to alcohol are emphasised. “When it is not possible to enable the exercise of real control, it may be advantageous to induce the illusion of control” (Langer 1975, p. 326). Alcohol policy that influences perceptions of availability and perceptions of control, consistent with diminished risk, is not beyond comprehension.

The ‘PRACTISE’ Model is a conceptual framework and practical approach to maintaining alcohol as a legal product but reducing the prevalence of associated risk and harms.

Fundamental to the Model is the position that “low risk drinking means drinking low amounts of alcohol” (Sellman 2010, p.302). But, efforts to reduce one risk can bring about increases in another (Martinic & Leigh 2004). The Model aims to integrate limited alcohol availability and stronger behavioural control to potentially improve the next iteration of public alcohol policy for Australia. The more these policy aims are aligned in congruent ways, the greater the likelihood perceptions will facilitate reduced risk. In these circumstances, risk perceptions could have improved prospects for accuracy, for modifying consumption levels, and for altering the consequences of use. In agreement with the findings of this thesis, a feasible next step for public alcohol policy is formulated.

There are four components of the ‘PRACTISE’ Model. These are:

1. *Principles* to assist in the development of public alcohol policy and strategy;
2. *A Diagram* of the interrelationships of the ‘PRACTISE’ Model;
3. *A Four Ways Risk Index* to test the potential effectiveness of alcohol policy and strategic intervention; and
4. *Universal Aims and Targeted Objectives*.

8.3.1 Component One: Principles of the ‘PRACTISE’ Model

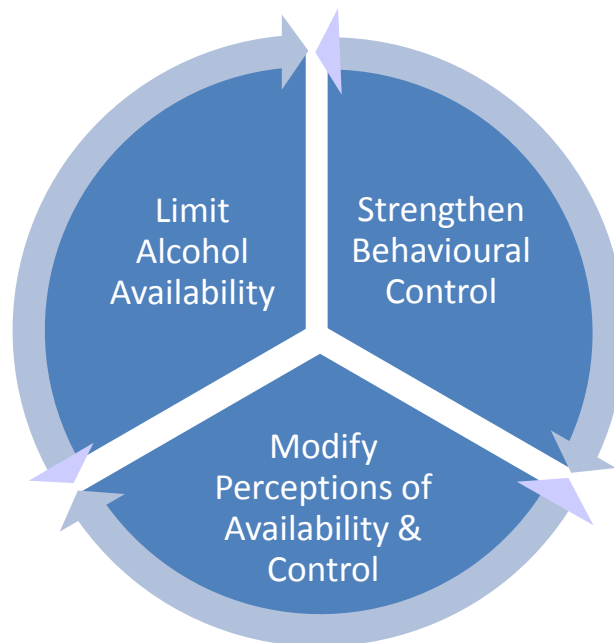
A number of *Principles* underpin the ‘PRACTISE’ Model. Core concepts and values to assist in the development of public alcohol policy are presented. Consistent with the Model, public alcohol policy can be built on these precepts.

1. Public alcohol policy should aim to achieve an acceptable level of risk in the use environment through integrating limited alcohol availability with stronger behavioural control;
2. Public alcohol policy should aim to achieve a reduction in population level alcohol availability to more limited levels of access;
3. Public alcohol policy should aim to achieve a reduction in situational alcohol availability to more limited levels of access;
4. Public alcohol policy should aim to modify perceptions that alcohol is highly available and little effort is required to access alcohol;
5. Public alcohol policy should aim to facilitate safer behavioural control more responsive to risk, particularly for subpopulations of drinkers most vulnerable to diminished control;
6. Public alcohol policy should aim to modify perceived behavioural control to safer responses, particularly for categories of drinkers most at risk;
7. Public alcohol policy should aim to protect drinkers from loss of control over alcohol as well as loss of control over behaviour;
8. Public alcohol policy should aim to change drinkers’ intentions to drink to intoxication, in order to reduce ‘determined drunkenness’.

8.3.2 Component Two: The ‘PRACTISE’ Model Diagram

Figure One illustrates the relationships of the ‘PRACTISE’ Model incorporating *actual alcohol availability* and *actual behavioural control*, together with *perceptions of alcohol availability* and *behavioural control*. Alcohol related risk and protective factors primarily correspond with these variables. As previously discussed, associations are evident between alcohol availability and control of behaviour. In addition, perceived availability and perceived behavioural control likely occur simultaneously in evaluation of the use environment, the attributes of consumption, and potential risk. Within these contexts, an integrated focus on the variables of the Model would address key areas of public alcohol policy concern.

Figure 1: The ‘PRACTISE’ Model



According to the 'PRACTISE' Model:

- i. **Alcohol availability should be limited through public alcohol policy.** The level of alcohol availability at both population and situational levels – physical, social and price related factors - contributes to *population and situational consumption and harms*.
- ii. **Behavioural control should be strengthened through public alcohol policy.**
The level of behavioural control – as command of intended actions - contributes to *alcohol associated risk, particularly for vulnerable subpopulation groups*.
- iii. **Perceptions of alcohol availability and behavioural control should be modified through public alcohol policy:**
 - a. **Perceived availability of alcohol should be reduced.** Perceived alcohol availability – as the subjective evaluation of ease or difficulty of access and affordability - accounts for *variation in alcohol demand*;
 - b. **Perceived behavioural control should be increased.** Perceived behavioural control – as the subjective evaluation of command of actions - accounts for *variation in alcohol associated behaviours*.

8.3.3 Component Three: Policy Risk Index of the ‘PRACTISE’ Model

The ‘PRACTISE’ Model includes an ‘index of risk’ to appraise potential policy effectiveness. No evidence is found in the literature of a formal risk appraisal for the alcohol policy development stage in Australia. A comparative risk analysis of alcohol control policies has been conducted across a number of other countries (Brand et al. 2007). Within the ‘PRACTISE’ Model, the adoption of a risk index is recommended as prospective action early in alcohol policy framing and at significant milestones in the policy cycle. In these ways, policy aims, objectives, goals and strategies are appraised for potential efficacy and retrospective success.

A *Four Ways Risk Index* is developed. Adoption of the risk index could help improve future policy outcomes and decrease alcohol associated harms for Australia. Use of a risk index is recommended, not only during development and implementation phases of policy, but also as an evaluation tool. Ideally, policy synergy is sought through the *Four Ways Risk Index* in order to secure alcohol availability and consumption behaviours at more acceptable levels of risk and lower levels of harm. A risk test is proposed as follows.

Does the policy approach facilitate more acceptable levels of risk by:

- Limiting the *actual availability of alcohol*, both general and situational, to safer levels;
- Modifying the *perceptions of the availability of alcohol* to safer levels;
- Strengthening drinkers’ *actual behavioural control* to safer responses; and
- Modifying drinkers’ *perceptions of behavioural control* to safer responses.

8.3.4 Component Four: Universal Aims and Targeted Objectives

It is recommended that aims and objectives of public alcohol policy be formed according to the ‘PRACTISE’ Model. A broad structure for public alcohol policy in Australia, consistent with the Model, is presented in *Table Eight*.

Table 8: Public Alcohol Policy Development

Universal Aims and Targeted Objectives				
Public Alcohol Policy	Alcohol Availability	Perceived Alcohol Availability	Behavioural Control	Perceived Behavioural Control
Universal Aims for the Environmental Context of Use	To limit the population availability of alcohol	To modify perceptions of alcohol availability of the population	To strengthen behavioural control of the population	To modify perceptions of behavioural control of the population
Targeted Objectives for Consumption Behaviours	To limit the situational availability of alcohol in local circumstances and drinking settings	To modify perceptions of situational availability in local circumstances and drinking settings	To strengthen behavioural control of at risk drinkers	To modify perceptions of behavioural control of at risk drinkers

The ‘PRACTISE’ Model, as a scaffold for conceptualising alcohol risk, enables the development of a suite of interventions for public alcohol policy adoption. The framework is consistent with other programs that tightened controls on alcohol and rendered drinking less risky, like the Living with Alcohol Program (d'Abbs 2004). The Model is a foundational reference point from which alcohol policy, goals and strategies can be developed. A portfolio of interventions applicable to supply, demand and harms is presented in *Chapter Nine*. The Model can be used to clarify understanding of why the risk and harms from alcohol continue in Australia.

8.4 Impact of the ‘PRACTISE’ Model

The ‘PRACTISE’ Model has potential to deliver a reduction in the unacceptable levels of risk from alcohol currently experienced in Australia. Safer alcohol environments and drinking behaviours are sought. In agreement with the research previously analysed (*Chapters Five and Six*), variation in alcohol availability and drinker control facilitates change to consumption and risk. Loss of control is less apparent when availability and consumption are limited. “Control is apparently an important variable in accounting for risk denial” (Sjoberg 2000, p. 3). When drinkers envisage control of behaviour, acknowledgement of alcohol related risk is more certain to occur; the converse is likely valid. Perceived alcohol availability and perceived behavioural control likewise mitigate or increase risk. Based on theoretical findings, the ‘PRACTISE’ Model is anticipated to deliver more tolerable levels of harm.

An integrated portfolio of strategies represents the most pragmatic way forward for alcohol policy of the future and is more defensible in the current political and social climate in Australia. Consistent with this position, *modest reform* is proffered as an achievable next stage for public alcohol policy. Stepwise change could be easier to achieve. This approach, under the Model, may prove more satisfactory to the alcohol industry; this is not the primary concern of public policy leadership through an alcohol reform agenda. A projected timeframe for change under the Model is at least a twenty-year period, with future generations of drinkers gaining the more substantial health and social benefits.

8.5 Strengths of the ‘PRACTISE’ Model

Taking the various components into account, the ‘PRACTISE’ Model has a number of strengths. Based on international and national evidence, the Model is formed from AT (Bruun et al. 1975) and the TPB (Ajzen 1991; Ajzen & Madden 1986) to achieve an

integrated policy approach. Environmental and behavioural change is central to the Model, able to be applied to an array of drinking settings and alcohol related actions. As a policy paradigm for the development and prioritisation of policy agendas, the Model presents a viable public policy alternative to current approaches for alcohol in Australia. As a pragmatic tool, the Model enables the appraisal of alcohol associated risk and the development of universal and targeted interventions to counter such risk.

The framing of public alcohol policy, according to the 'PRACTISE' Model, is anticipated to achieve a number of positive policy outcomes. Opportunity for political leadership is afforded through an open appeal to more acceptable risk from this highly popular beverage. The Model represents a conceptual and decision making framework to assist governments in priority setting for the public health agenda of risk and harms from alcohol (Room, Babor & Rehm 2005). As an additional benefit, the aims of the Model align with the strategic focus of the National Preventative Health Taskforce (National Preventative Health Taskforce 2008, 2009) and the Australian National Preventive Health Agency (Australian National Preventive Health Agency 2012): to prevent and reduce the health and social consequences of alcohol use.

As an available alcohol policy 'product', the 'PRACTISE' Model provides opportunity for government cost saving through streamlined policy development processes. Fiscal gains from the avoidance of poorly conceived and ineffectual policy could ensue. With risky alcohol environments and particular at risk groups, the Model represents a strong starting point for those setting, circumstances, and populations in need of specific policy attention. To date, targeted strategies for drinkers most at risk have not been undertaken in an organised way in Australia. This is due, in part, to the commonalities between subpopulations at risk not being earlier identified and a systematic way of addressing these

issues remaining underdeveloped to date. In the current national policy milieu, intoxication is presented as the chief modifiable risk from alcohol (National Drug Strategy 2006); other patterns of consumption are largely ignored. The ‘PRACTISE’ Model integrates the principal environmental factors that contribute to risk with the primary attributes of consumption behaviours. The Model helps identify ‘loss of control’ as a shared problem of drinkers at risk and intoxication as just one of the drinking patterns in need of policy attention.

It could be possible, through promotion of the ‘PRACTISE’ Model, to influence politicians, policy makers, and the general public to take a more pragmatic view of alcohol availability and drinker control. A realistic position extends from governments reducing alcohol availability to more moderate levels, to acceptance on the part of drinkers that alcohol is less accessible in fewer settings, fewer community environments and fewer local establishments (Sulkunen 1997). A particular challenge for the Model is its applicability to the many ways alcohol is available, sourced, accessed, purchased and consumed. But, as demonstrated by this thesis, alcohol availability and behavioural control are fundamental to alcohol consumption and associated risk; the Model represents as an evidenced way to manage future strategic action for alcohol. Nonetheless, limitations are apparent.

8.6 Limitations of the ‘PRACTISE’ Model

Challenges are forthcoming in integrating a health science population theory with a social science behavioural theory, as accomplished in the ‘PRACTISE’ Model. A tension remains in combining population based evidence of alcohol availability and consumption with the dimensions of behavioural control, primarily psychosocial constructs. The Model is yet to be tested for its effectiveness in reducing risk and harms at the population level.

A considerable reduction in the prevalence of harm may not be able to be achieved for all areas of concern, for example, the mental health problems associated with alcohol. These conditions are complex in development and management (American Psychiatric Association 2000). As an additional constraint, the Model relies to some extent on research of self-report judgments of alcohol availability and behavioural control. These are subject to the usual limitations of self-report methods (McCambridge & Kypros 2009). The Model does not identify which element, alcohol availability or behavioural control, is predominant in particular drinking environments or specific consumption behaviours. These influences are likely interactive.

The possibility of unspecified and, therefore, unacknowledged political and policy risks associated with the Model is similarly acknowledged. How governments respond to the Model will be influenced, to some extent, by factors external to Australian policy processes. For example, the current global financial crisis could render any reduction in alcohol availability as an unacceptable political scenario. Furthermore, the Model will not be easily accepted by seasoned drinkers or communities depending on business gains derived from alcohol sales. The Australian Government could be constrained by strong industry resistance to the 'PRACTISE' Model; threat to industry profits from reduced availability and consumption would compel industry opposition. Added to this, the reliability and validity of the Model is unproven to date. The dimensions of public availability and personal control do not fully account for the complexity of relationships in alcohol use environments or consumption behaviours. At Australian state and territory levels, the heterogeneity of local communities and population groups would deny the possibility of a 'one size fits all' approach to alcohol policy.

But, as shown in this thesis, there are benefits of an appeal to theory and theory based alcohol policy. Related research adds to the efficacy of the ‘PRACTISE’ Model. As an example, perception of social norms is important, but of indirect and lesser influence than availability within AT (*Chapter Five*), or control related factors within a TPB context (*Chapter Six*). Yet earlier research suggests it is beneficial to use a social norms approach with adolescent drinking (Hughes 2008). Influencing young people’s perceptions that peers are drinking to high levels of intoxication and risk may add to the gains from reducing availability and strengthening behavioural control. In certain circumstances, variations to the Model could result in improved public alcohol policy outcomes. These are now discussed.

8.7 Variants of the ‘PRACTISE’ Model

‘Binge’ drinking could be better addressed through a variant of the ‘PRACTISE’ Model. An important contributor to ‘binge’ drinking is *intentions* (Jamison & Myers 2008; Johnston & White 2003; Norman, Armitage & Quigley 2007). Yet, overall, *perceived behavioural control* is a strong predictor of drinking intentions and drinking behaviours (*Chapter Six*). Even so, strategies to alter intentions to ‘binge’ drink can be pursued by: creating limits to situational access and availability of alcohol; on site interventions to intercede when risk is evident; controlling cheap prices and ‘two for one’ deals; and support for behaviours that more safely respond to risk in alcohol associated contexts. A focus on intentions to drink to high levels of consumption can add to the benefits of addressing alcohol availability and behavioural control in public alcohol policy. In this regard, the Transtheoretical Model provides understanding of the stages of change to be negotiated by drinkers in pursuit of safer consumption (Prochaska & DiClemente 1992; Prochaska & Velicer 1997). The achievement of significant milestones of change is relevant to local communities and whole populations.

In another variant of the Model, the impact of availability appears to outweigh behavioural control responses to alcohol. Indigenous Australians in outlying communities may benefit from interventions aimed at safer behavioural control. Nonetheless, relationships between supply, sales, consumption and price appear more complex in development and consequence in Australian Indigenous communities than for the general population. Hence, the greatest impact on reducing consumption for this at risk group is through restricting the availability of alcohol (The Drug and Alcohol Office Western Australia & the University of Notre Dame Australia Broome Campus 2010). Availability from illicit supply and canteen sales plays an important role in 'irresponsible' use and harms in Indigenous communities (Martin 1998). Issues of self-determination and discriminatory prohibitions also shape the Indigenous response, with national alcohol policies showing variable success in changing alcohol use and associated harms for these vulnerable peoples (Brady 2000).

According to economic research and economic theory, alcohol does not perform like other products in the marketplace; purchase, as demand, is less inclined to vary when the price of alcohol, as an addictive good, is altered (Godfrey 1989). Supply and Demand Theory (Klein 1988; Marshall 2009) together with Availability Theory (Bruun et al. 1975) can inform a focus on the price of alcohol. Whilst pursuit of an alcohol pricing model is appealing, this aim should be secondary to restricting physical availability through legislative and regulatory means. When actual availability is curtailed, cues to drink are less powerful and preoccupation with controlling responses to alcohol much reduced (Williams & Ricciardelli 1999). How the 'PRACTISE' Model informs interventions for drinking environments, drinking circumstances, and those most at risk is addressed in the following chapter. Also discussed are the opportunities and challenges associated with implementation of the Model.

Chapter 9: Opportunity and Challenge in Implementing the ‘PRACTISE’ Model

9.1 Introduction

There are a number of models with some relevance to public policy implementation (Hill & Hupe 2009). The ‘PRACTISE’ Model stands out; it seeks to provide a reform agenda of acceptable levels of risk from alcohol and acceptable levels of policy change. The dimensions implicit in the Model are not necessarily static, but alter according to external factors such as alcohol associated risk, and internal perceptions like the subjective assessment of risk. Regular evaluation and adjustments in strategic focus are recommended. The intractability of problems inherent in alcohol availability and the difficulties associated with consumption behaviours will influence the successful implementation of the Model. Even so, reducing alcohol availability tempers behavioural control; limiting access to alcohol alters intention to drink.

A public alcohol policy model has not previously been developed to address these issues concurrently; intent to shape such a model has been wanting. Limiting alcohol availability is a complex policy agenda for Australia due to National Competition Policy (National Competition Council 1995), and the leverage of the alcohol industry to achieve their political ends (Cook 2005). Currently, high alcohol availability in Australia adds to the problems of drinkers at risk by facilitating, in effect, unhindered access to alcohol. Stronger behavioural control is hard to achieve for drinkers experiencing loss of control as part of their dependence on alcohol.

Moving to the action stage of policy is crucial if intended changes are to be accomplished (Barrett 2004). The ‘PRACTISE’ Model supports government accountability for reducing access to alcohol, but also acknowledges the political and practical difficulties in overly

limiting the availability of a legal product. As a counterbalance to severe government restrictions on alcohol, the Model supports individual and collective responsibility to help facilitate safer drinking behaviours. In this policy environment, drinkers would not be reduced to vulnerable victims of the alcohol industry with no choice in their alcohol use (Herrick 2011). Implementation of the Model is anticipated to achieve some preliminary gains, as harms to communities and individuals begin to abate and fiscal costs from alcohol reduce.

Even so, governments as well as communities are resistant to large scale change in policy direction; concern over the economic impacts of reduced availability and consumption could hinder acceptance of the Model. However, if incremental adjustments are sought, both governments and communities have time to respond to social and economic change and plan accordingly. Implementation of the ‘PRACTISE’ Model may prove more pragmatic for governments and policy makers as they seek to address the often competing interests of public health and social concerns, economic costs and harms from alcohol, pressure from the alcohol industry and associated businesses to maintain current levels of availability, and pressure from drinkers wishing to maintain current levels of consumption.

9.2 Public Alcohol Policy Transformation

9.2.1 Goals and Strategies for Implementation

A goal, incremental in achievement for Australian alcohol policy, is to reduce annual per capita consumption by one litre overall - through reduced availability and safer behavioural control - in order to lessen the consequences of drinking. The ‘PRACTISE’ Model provides some of the answers to how this could be achieved; its potential as an alcohol policy guide is discussed in previous chapters. Substantiation of the Model’s utility to inform a portfolio of goals and strategies is outlined to follow.

Table Nine provides examples of goals and strategies drawn from analysis of AT (Bruun et al. 1975) the TPB (Ajzen 1991; Ajzen & Madden 1986) and associated research. These approaches represent strong policy interventions consistent with the ‘PRACTISE’ Model. An array of availability, access, supply, demand, consumption and harm related circumstances are addressed through these various measures. Important areas for strategic prevention are determined as: *Universal Measures to Limit Population Risk*; *Targeted Interventions for Risky Situational Environments*; and *Targeted Interventions for Subpopulations At Risk*. Relevance to population and behavioural theories is described, as well as the applicability of other theoretical models. Related theories provide additional understanding of the goals and strategies for policy action; examples follow.

Table 9: Goals and Strategies for Implementation

Universal Measures to Limit Population Risk				
Policy Intent	Goals	Strategies	Relevance to the 'PRACTISE' Model	Relevance of Other Models
<i>To limit the population availability of alcohol</i>	<p>To reduce population level availability of alcohol below current levels</p> <p>To reduce per capita alcohol consumption by one litre of pure alcohol</p>	<p>Utilise the universal policy levers of: legislation, price, taxation and legal penalties</p> <p>Utilise: Public Health, Police and Liquor Licensing Legislation and Regulation; volumetric taxation; and alcohol excise measures</p>	<p>Consistent with the 'PRACTISE' Model</p> <p>Consistent with AT and related research analysed in Ch. 5: reducing availability can reduce a range of alcohol associated harms via reduced consumption</p>	<p>Reduced availability, as supply, will reduce demand, as consumption, and thereby reduce harms, consistent with 'Harm Minimisation'</p> <p>Supply and demand are interrelated according to SDT; supply relates to the quantity and price of alcohol available to be purchased</p> <p>With the RAM, supply is contextualised as price, taxes and legal penalties</p>
<i>To modify perceptions of alcohol availability across the population</i> <i>*Further development of perceived availability strategies is necessary - these can be informed by thesis findings</i>	<p>To reduce demand for alcohol and reduce the awareness of alcohol as a consumable product</p> <p>To make alcohol less convenient to purchase, less socially available, and less affordable for the population as a whole</p> <p>To reduce perceptions that the consumption of alcohol conveys beneficial use</p> <p>To create perceptions that 'good health' is a desirable product</p>	<p>Utilise the policy levers of: effective regulation of promotion, advertising and sponsorship of alcohol; labelling of alcohol with health risk and pregnancy use warnings to reduce the perceived utility of the product; and counter advertising by governments and public health officials to promote the message that 'good health' is desirable</p>	<p>Consistent with the 'PRACTISE' Model</p> <p>Consistent with research analysed in Ch. 5: perceptions of alcohol as easy to obtain are associated with a number of consumption related harms</p>	<p>Expectancies about environmental cues such as alcohol availability are consistent with SCT and related social influences</p> <p>Modifying the perceived utility of alcohol could help reduce dependence and addiction, consistent with the RAM</p> <p>Counter media messages that promote health as a desirable 'good' are consistent with the principles of economic theory</p>

Targeted Interventions for Risky Situational Environments				
Policy Intent	Goals	Strategies	Relevance to the 'PRACTISE' Model	Relevance of Other Models
<i>To limit the situational availability of alcohol</i>	To reduce alcohol availability in a range of local supply, access, purchase, and consumption related situations	<p>Utilise the policy levers of: stronger public health legislation; stronger liquor licensing control; and increased cost of purchase to help protect the population from alcohol as a public health risk</p> <p>Legislate for Public Health input into liquor licensing decisions in jurisdictions; a cap on liquor licenses; restrictions on outlet density; restrictions on hours and days of alcohol sale; increase in the age of legal purchase of alcohol; and the prevention of underage availability in public and private settings</p>	<p>Consistent with the 'PRACTISE' Model</p> <p>Consistent with the relevance of AT to more immediate environments, as confirmed in Ch. 5</p> <p>Consistent with research analysed in Ch. 5: perceived ease or difficulty in accessing and purchasing alcohol is associated with a range of consumption indicators and physical availability factors</p>	<p>Expectancies that underpin situational impediments are consistent with SCT</p> <p>With SDT, supply relates to the quantity and price of alcohol available to be purchased</p>
Targeted Interventions for Subpopulations At Risk				
Policy Intent	Goals	Strategies	Relevance to the 'PRACTISE' Model	Relevance of Other Models
<i>To strengthen behavioural control for at risk population groups most vulnerable to loss of control</i>	To secure safer behavioural control of alcohol use and associated behaviours for vulnerable drinkers	<p>Develop and implement: approaches that encourage drinkers to monitor their response to alcohol such as the 'Think Before You Drink' program</p> <p>Counter drinkers' intentions to become intoxicated</p> <p>Introduce: 'Public Order Response Teams' to target intoxicated and out of control</p>	<p>Consistent with the 'PRACTISE' Model</p> <p>Consistent with the TPB: control of behaviour is directly influenced by perceived control; intentions also influence drinking behaviour</p> <p>Consistent with the research analysed in Ch. 6: strengthening actual control can strengthen perception of control</p>	<p>SCT acknowledges the complexities that underpin behaviours; expectancies about behavioural outcomes and personal impediments are consistent with SCT</p> <p>How drinkers adapt and change alcohol related behaviours is explained by the TTM</p> <p>If loss of behavioural control is</p>

		<p>behaviours in risky drinking precincts</p> <p>Implement: 'Responsible Service of Alcohol' programs, related server training and monitoring systems</p> <p>Implement: environmental changes such as food service, free water, and toughened glass containers</p>	<p>In relation to 'determined drunkenness' and intentional 'binge' drinking, changing intentions and strengthening behavioural control concurrently could increase the effectiveness of interventions consistent with TPB research</p>	<p>not a risk, the TRA explains and predicts drinking outcomes without reference to the TPB</p>
<p><i>To modify perceptions of behavioural control for at risk subpopulations most vulnerable to loss of control</i></p> <p><i>*Further development of perceived control strategies is necessary - these can be informed by thesis findings</i></p>	<p>To secure safer perceptions related to alcohol use and consumption behaviours for vulnerable drinkers</p>	<p>Strategies identified in sections above in the areas of alcohol availability, perceived availability, situational availability, and behavioural control facilitate safer perceptions of behavioural control</p>	<p>Consistent with the 'PRACTISE' Model</p> <p>Consistent with the research analysed in Ch. 6: safer perceptions of behavioural control can lead to safer drinking outcomes; inaccurate perceptions are an alcohol related risk</p>	<p>Perceptions of susceptibility to risky drinking, as well as perceived benefits and costs, are consistent with the HBM</p> <p>The identification of cognitions that lead to behaviour is consistent with SCT and related social influences</p> <p>Social norms, as perception of others' drinking and others' attitudes to drinking, are an important focus with young people (Hughes, 2008), in conjunction with the 'PRACTISE' Model</p>

AT: Availability Theory

HBM: Health Beliefs Model

RAM: Rational Addiction Model

SCT: Social Cognitive Theory

SDT: Supply and Demand Theory

TPB: Theory of Planned Behaviour

TRA: Theory of Reasoned Action

TTM: Transtheoretical Model

9.3 Implementation of the ‘PRACTISE’ Model

9.3.1 Alcohol Availability and Behavioural Control

It is far sighted to recommend the policy aims of limited alcohol availability and stronger behavioural control for Australia. Risky *levels of consumption* are prevalent (Australian Institute of Health and Welfare 2011; Chikritzhs et al. 2003; National Health and Medical Research Council 2009); a high proportion of the *volume of alcohol* is consumed in risky ways (Chikritzhs et al. 2003); and *loss of control* is an issue for subpopulations at risk (*Chapter Six*). In support of improved public policy implementation, greater emphasis on limiting population and situational availability is consistent with the ‘PRACTISE’ Model. Reduced demand through reduced access is essential to reduced consumption and overall harms (Bruun et al. 1975; Edwards et al. 1995; Single 1988; Stockwell & Gruenewald 2001), such as mortality, disease, accidents and violent acts (Norstrom 2006; Norstrom & Ramstedt 2005; Ramstedt 2001a; Skog 2001a). In these ways a much safer environment for drinking is possible, one that more accurately reflects the alcohol related concerns of those surveyed in Australia (Foundation for Alcohol Research & Education 2012a; Wilson 2009).

As pursued in the ‘PRACTISE’ Model, making safe and healthy choices easier is fundamental to a population based public health approach (Marteau et al. 2011). In Australia, the proportion of the population who are *nondrinkers* has remained fairly constant over a number of decades at approximately ten percent (Australian Institute of Health and Welfare 2008; National Health and Medical Research Council 2009). More recent estimates suggest this figure could be as high as seventeen percent (Australian Institute of Health and Welfare 2010b). Strategically, the risk status of those who *are* drinkers can be altered in accord with a reduction in the volume of alcohol available at the population level (Babor et al. 2003; Babor et al. 2010; Bruun et al. 1975), the amount

consumed, and safer patterns of use (Australian Institute of Health and Welfare 2008, 2011; Chikritzhs et al. 2003; National Health and Medical Research Council 2009).

Situational factors like legal drinking age, density of outlets and hours and days of sale are important to local policy advancement (Single 1988; Stockwell & Gruenewald 2001).

Behaviours undertaken in association with consumption, such as ‘drink driving’ (Loxley et al. 2004; Parker et al. 1992; Sheehan et al. 1996), also require a continued policy focus.

As acknowledged in the ‘PRACTISE’ Model, drinking responses are shaped by a number of primary indicators of influence. A decline in consumption could be achieved through firstly creating policy synergy between limited alcohol availability and stronger behavioural control for drinkers. To then seek incremental improvements over subsequent policy iterations would add to the gains from initially addressing alcohol availability and drinking behaviours concurrently in alcohol policy. A one litre reduction in annual per capita consumption of pure alcohol is a crucial goal for alcohol policy in Australia, as determined in *Chapter Five*. Strategies that change consumption behaviours are also important, as confirmed in *Chapter Six*. Situational factors, such as risky drinking environments and subpopulations most at risk, are additional targets for policy.

Consistent with the ‘PRACTISE’ Model, a focus on drinkers most at risk could increase the gains from population based strategies that regulate supply and access for the consumer. Successful policy relies on securing drinkers’ behaviour to safely counteract risk and modifies alcohol related actions accordingly. Alcohol policy can aim to change intentions to the best possible policy and population advantage, a finding associated with the Model. Implementation of the ‘*Think Before You Drink*’ social marketing campaign (Department of Justice Victoria 2009) could help modify drinkers’ intentions and create less risky alcohol environments. The ‘think before you drink’ message seems to portray

alcohol consumption as inevitable, but optimistically, at reduced levels of intake and risk. Achieving safer drinking intentions for population groups most at risk is a complicated exercise, but nonetheless can be sought through stronger behavioural control.

Further development of behavioural control strategies could add to the protection of at risk drinkers. Even so, evidence reveals that reductions in availability and consumption are the most effective policy levers overall (Bruun et al. 1975; Norstrom & Ramstedt 2005), important for the whole population as well as subpopulation groups. For example, reductions in alcohol availability in Indigenous communities need to be consolidated over time in order to stabilise local health and social environments, improve the wellbeing of these communities, and facilitate safer drinking practices (Duncan 2011; Kinnane et al. 2009; The Drug and Alcohol Office Western Australia & the University of Notre Dame Australia Broome Campus 2010).

The active promotion of alternate beverages to alcohol in licensed premises is consistent with the 'PRACTISE' Model, but could draw industry opposition. Nonetheless, harm reduction interventions, like the *'Responsible Service of Alcohol'* (Australian Hotels Association Western Australia 2012), are already operative in most Australian jurisdictions. Environmental strategies such as improving physical, social and staffing conditions (Hughes et al. 2011), introducing toughened glass in drinking establishments (Stockwell 2007), and forming *'Public Order Response Teams'* (Tasmania Police 2010), could bring about an increase in community safety and reduce overall consumption.

9.3.2 The Role of Perceptions

As well as a focus on actual alcohol availability and actual behavioural control, perceptions of alcohol availability and perceptions of behavioural control are additional areas for policy attention. Accurate perceptions are less likely in circumstances of ready availability and high risk drinking whereby behaviour and thought processes are compromised. In these situations, there is greater risk of loss of control (Kahler, Epstein & McCrady 1995). Implementation of the 'PRACTISE' Model could help reverse this trend. Perceptions of alcohol availability and behavioural control, as significant predictors of alcohol risk, can be utilised alongside actual availability and actual control to inform strategic approaches. As borne out by evidence, the effects of a history of problem drinking extend to changes in perception of control and greater alcohol associated risk (Schlegel et al. 1992). These findings show perceptions are subject to greater fluctuation and potential inaccuracy when consumption increases to higher levels.

Making alcohol *appear* less available could assist in achieving safer behavioural control. According to the 'PRACTISE' Model, improvements in perception of control, especially for those drinkers with low self-control (Higgins & Marcum 2005), may see good gains made in reducing alcohol risk. The introduction of self-control strengthening programs for adolescents (Wills et al. 2006) could assist in changing behavioural perceptions and cut short otherwise risky drinking 'sessions'. Primary prevention programs focused on excessive drinking and drunkenness (Schlegel et al. 1992), and change to perceptions of health benefits from use, help convince drinkers they can exert control over alcohol intake. Some attention to changing the perceived value of alcohol could contribute to a reduction in risk. The role of perceptions of social norms, within a TPB construct, emerges as a weaker influence on drinking behaviours overall than other elements of the theory.

Nonetheless, addressing the perception of social norms is an important avenue to prevent risky drinking in young people (Hughes 2008; Hughes et al. 2008).

A goal to modify perceptions of risk is consistent with the 'PRACTISE' Model. The appeal of alcohol may gradually be changed by legislation requiring the display of health and pregnancy use warnings messages at 'point of sale', consistent with the *Australian Guidelines to Reduce Health Risks from Drinking Alcohol* (National Health and Medical Research Council 2009). The perception of alcohol as 'no ordinary commodity' (Babor et al. 2003; Babor et al. 2010) would thereby be better assured. Promotion of the Australian Alcohol Guidelines can be supported by policy approaches that increase perceptions of the risk of use and increase the desirability of lower consumption. Adherence to low risk single occasion drinking guidelines is predicted by the TPB variables (Murgraff, McDermott & Walsh 2001), primarily perceived behavioural control.

Interventions to change the desirability of excessive drinking are called for.

Transformation of the social environment is necessary to reduce external pressures, such as alcohol related cues, on intentions to 'binge' drink (Norman, Armitage & Quigley 2007).

The perceptions informing these drinking phenomena could then also alter. Advertising campaigns to encourage behaviour change and curb 'binge' drinking can form part of a comprehensive campaign to improve the safety and wellbeing of the population.

Consistent with a health promotion approach, emphasis on individual choice and personal control over driving violations in drink driving campaigns is beneficial (Parker et al. 1992). An aim to influence intentional drunkenness by altering the perceived benefits of intoxication (Norman, Armitage & Quigley 2007) could strengthen coping mechanisms and encourage drinking alternatives (Pearlin & Schooler 1978). The effectiveness of social manipulation to reduce heavy consumption is consistent with other interventions,

like the Living with Alcohol Program (d'Abbs 2004), that influenced population level drinking including local Indigenous consumption.

Counter advertising of positive health messages confers some policy advantage and assuages the subjective impacts of the promotion and advertising of alcohol (Saffer 2002). Stronger regulation of alcohol advertising alters the ways young drinkers think and act regarding alcohol (Anderson et al. 2009; Casswell & Maxwell 2005; Casswell & Zhang 1998; Ellickson et al. 2005; Robinson, Chen & Killen 1998). Heavy drinkers and others with positive alcohol expectancies also benefit from such approaches (Smart 1988). Even so, in applying the 'PRACTISE' Model, care should be taken not to increase alcohol consumption through active promotion of safe consumption, a well acknowledged paradox (Hawks 1989). The message can be conveyed that keeping within low risk drinking guidelines is sufficient to enjoy the benefits of drinking, without the risks that exceeding drinking limits can signify (Murgraff, McDermott & Walsh 2001).

The alcohol environment is vital to facilitating lower consumption levels and lower levels of risk (Murgraff, McDermott & Walsh 2001) and to supporting drinkers' *belief* that they can reduce overall use. A focus on environmental risk factors, such as the availability of alcohol and drinking peer groups (Marcoux & Shope 1997), supports safer perception of control. Prenatal interventions, based on sustained behavioural control (Smith et al. 1987), could strengthen the belief of women that they can stop drinking once they know they are pregnant. Interventions to encourage abstinence throughout pregnancy and breastfeeding are needed, consistent with alcohol guideline recommendations (National Health and Medical Research Council 2009).

In summary, the development of goals and strategies - *to limit actual availability and modify the subjective sense that alcohol is readily available* – represents considerable

policy advancement in containing risk and preventing harms for the Australian population. In addition, a strategic approach - *to strengthen behavioural control and modify perceived behavioural control* to safer responses – complements availability measures and could contribute to policy gains. Harms due to diminished control are expected to decline in this form of policy environment, where potential loss of control is offset by limited access and availability of alcohol. Drinkers' concern over limited availability can be reduced through potential improvements to control awareness. But knowledge varies as to how intentional abstinence might morph into unplanned drinking, or intended intoxication into unintentional loss of control. Within a physiological context, loss of control is attributed to the intrinsic properties of alcohol (Julien 1995). Corresponding with the 'PRACTISE' Model, these risks are explained with reference to unexpected availability or greater loss of behavioural control than originally envisaged or planned for.

9.4 Further Strategy Development for Perceptions

Strategies to modify perceptions of alcohol availability and perceptions of behavioural control are, as yet, not clearly conceptualised. Risk awareness is linked with consumption through alcohol expectancies (Leigh 1987; Leigh & Stacy 2004) and with perceptions of availability and perceptions of control, as previously confirmed. Sjoberg (2000) cites earlier research showing availability is important to understanding risk perception; collated data reveals perceived control is a crucial factor in risk protection and risk denial. For individuals, the correlations are less robust, with distinctions drawn between general and personal risk (Sjoberg 2000).

In these contexts, selective interventions to temper risk through perceived alcohol availability and perceived behavioural control require further development for alcohol policy. Investigation of the ways that perception related strategies can be formed and the

best approach to implementation can enlighten future public policy development. The influence of physical and social factors in shaping perceived availability and alcohol consumption of adolescents (Kuntsche, Kuendig & Gmel 2008) can be further clarified for policy. A focus on these variables has potential for risk reduction. The multiple risk and protective factors associated with alcohol (Branstrom, Sjostrom & Andreasson 2008; World Health Organization Alcohol and Public Policy Group 2004) are best not overlooked in public policy. The protective benefits of difficult access to alcohol (Knibbe et al. 2005) are a related policy opportunity.

A number of potential policy levers are evident, based on the research reviewed in this thesis. The interrelationships between perceived availability, actual availability and consumption related factors (Abbey et al. 1990a; Abbey, Scott & Smith 1993; Ames & Grube 1999; Rabow et al. 1982) represent a potential starting point. The impact of environmental factors on alcohol related perceptions is also worthy of focus (Marcoux & Shope 1997; Norman, Armitage & Quigley 2007; Norman, Bennett & Lewis 1998), as is the role that perceived availability plays in social influences to drink and social learning processes (Epstein et al. 1999; Epstein, Botvin & Diaz 1999). The links between perception of risk and sources of alcohol (Wagenaar et al. 1996) are important to future public policy direction. The perception of alcohol as easy to obtain (Komro et al. 2007; Paschall et al. 2007) needs to be modified through alcohol policy, alongside efforts to limit actual availability.

9.5 Relevance of Other Theories and Related Research

Population and behavioural theories have relevance to alcohol policy, as determined by the ‘PRACTISE’ Model. How populations negotiate change is alluded to by Skog (1985); one group with a predominant level or pattern of drinking can influence another group with different drinking inclinations. Behavioural modification can be further explained with reference to *General Diffusion Theory* whereby social networks and geographical proximity act as abstract agents of change (Ferrence 2001; West 2006). Loss of behavioural control can result in greater demand and higher consumption, which, in turn, increases alcohol sales as well as risk. In conjunction, greater demand for alcohol justifies increased manufacture and supply and easier access through the economic principles of *Supply and Demand Theory* (Klein 1988; Marshall 2009).

General economic theories refer to a ‘typical’ good and are not conceptualised to explain demand for addictive products like alcohol (Godfrey 1989). With alcohol, consumer demand is not so responsive to increases and decreases in price; alcohol shows different elasticities in the marketplace from nonaddictive goods. Nevertheless, the market performance of alcohol is consistent with the perception of alcohol as ‘no ordinary commodity’ (Babor et al. 2003; Babor et al. 2010). In the quest for good health and social outcomes, the many and varied influences that change the course of policy intent cannot be ignored. With alcohol, supply, demand, communication and culture come into play, making the alcohol policy environment a complex milieu (Edwards 2004).

Increases in past consumption can lead to increases in present consumption as addiction, clarified by the *Rational Addiction Model* (RAM) (Becker & Murphy 1988). “Individuals that discount the future heavily are more likely to become addictive” (Montoya & Atkinson 2000, p. 338). According to the RAM, with dependence and addiction, the

overall utility of alcohol decreases (Becker & Murphy 1988); harms invariably increase. The *Health Beliefs Model* (Becker 1974; Becker & Maiman 1975) explains the pursuit of health care by those with an alcohol related condition. How drinkers and, indeed, populations negotiate behavioural change related to alcohol is informed by the *Transtheoretical Model* (Prochaska & DiClemente 1992; Prochaska & Velicer 1997). But, according to the ‘PRACTISE’ Model, the cognitive influences on alcohol associated choice and the consequences of related decisions are primarily influenced by public alcohol availability and personal control factors.

9.6 Supporting Processes for the ‘PRACTISE’ Model

Whether the implementation of the ‘PRACTISE’ Model is approached from a ‘top down’ or ‘bottom up’ perspective or a combination of these processes, management of a multiplicity of factors is implicit. Implementation of the Model will require strategic effort. The shared responsibility of governments and communities in support of stronger public alcohol policy and legislation is acknowledged. Successful implementation of the Model will depend on how ‘out of control’ alcohol problems are perceived to be by governments and communities and the extent of policy regulation necessary to reverse this undesirable trend. Events that are ‘uncontrollable’ hinder policy implementation as much as they can propel policy action.

Community engagement is vital early in the development phase of policy; community representation is crucial in forging public policy direction. The implementation of current national alcohol policy in Australia has been largely ‘top down’, driven by the agendas of the previous Ministerial Council on Drug Strategy (MCDS), and the Intergovernmental Committee on Drugs (IGCD). National alcohol policy decisions are ‘in confidence’, with little opportunity for timely community engagement or robust community scrutiny.

Implementation at jurisdictional levels is driven by an endorsed national policy position, usually through an appointed policy implementation group. Community opinion is more often sought late in the policy development stage. Nonetheless, it is important citizens maintain control over the activities of government (Hill & Hupe 2009).

It could be possible to implement the 'PRACTISE' Model from a 'top down' perspective. However, if this type of approach is adopted, policy makers at federal and state government levels would firstly need to be introduced to the 'PRACTISE' Model and interpret this policy position for their particular strategic requirements. But policy implementation at jurisdictional and community levels often involves 'cherry picking' those goals and strategies able to be quickly achieved. This type of response can be due to a lack of understanding of the benefits of an integrated policy approach, as well as a lack of fit between national issues and local concerns. Advocacy and support for the Model from alcohol policy organisations are important to the uptake of the Model. Endorsement of the Model by the Australian National Preventive Health Agency (ANPHA) would be definite advantage. The inclusion of a representative of DrinkWise, an industry funded policy coalition, on the Board of ANPHA could preclude this desirable outcome.

The engagement of Directors of Public Health with the 'PRACTISE' Model will likely strengthen public alcohol policy for Australia. These public health officials are key figures in protecting the population from risk through policy and legislative responses for alcohol. But, given the current environment surrounding alcohol in this country, Public Health *Acts* will need to be reviewed to improve public health control of alcohol. Public Health *Acts* in jurisdictions need to regulate alcohol as a pressing public health problem (Room, Babor & Rehm 2005) and express legislation as an effective policy response (Babor et al. 2003; Babor et al. 2010; Loxley et al. 2004). Consistency of legislative aims, such as those that

govern Liquor Licensing, Police and Public Health, is vital to a strong legal framework for alcohol and vital to the 'PRACTISE' Model.

The 'Legislative Scoping Project', proposed by the Public Health Unit in Tasmania and sponsored by the local Inter Agency Working Group on Drugs, is illustrative of the change to alcohol related legislation that can be sought. Disparity between the Tasmanian *Liquor Licensing Act 1990*, facilitating an increase in the number of liquor licenses in the context of business opportunity and community development, and the Tasmanian *Public Health Act 1997*, protecting and improving the health and wellbeing of all Tasmanians, is a focus for creating a safer alcohol use environment. Restrictions on liquor licenses sought through the scoping project are fundamental to the 'PRACTISE' Model, as are pursuit of more stringent requirements for liquor license applications.

Limited resourcing of large scale policy change has been acknowledged for a number of decades to contribute to selective implementation (Smith 1973). Even so, selective intervention could occur with the 'PRACTISE' Model. This occurrence could limit the effectiveness of future alcohol policy in Australia and constrain the benefits to be gained for local communities. An advantage of community involvement in alcohol policy 'at the grass roots level' is as a voice fighting against the injustices of alcohol associated incidents, like road trauma (Mothers Against Drunk Driving 2011), and alcohol associated disorders, such as fetal harms (Jean 2012). Advocacy delivers a level of local as well as national change.

It is in the context of community engagement that the sociocultural frame of current national alcohol policy has merit (National Drug Strategy 2006). The 'average' citizen has limited knowledge and interest in the legislative and regulatory processes that underpin the availability and supply of alcohol. Yet, the message of 'the need to change the culture

surrounding drinking' is easily understood. Knowledge is certainly apparent in the community that, beyond a certain level, the use of alcohol results in calamitous events like fatal traffic accidents, and long term harms such as dependence and liver disease. For those who experience health and social harms or legal consequences related to alcohol, the idea of changing the culture surrounding alcohol use in Australia may hold some appeal. But where alcohol availability is high and loss of behavioural control is prevalent, cultural change is not easy to engender.

The Model does not offer all the answers; that would be difficult with alcohol. What is presented is a way of addressing the main characteristics of the alcohol use environment together with the primary attributes of consumption behaviours. The Model differs from other alcohol policy approaches. It focuses on two main issues fundamental to all alcohol use: alcohol availability and behavioural control. As such, the Model provides governments with a clear approach to policy prioritisation and an integrated framework for policy action. Implementation of the Model could facilitate a greater awareness of the personal control factors attending alcohol and provide communities with safer environments associated with use. Through subsequent election cycles, ongoing community endorsement of governments that adopt the Model will be necessary. Sustainable policy change, consistent with the direction of the Model, depends on active community engagement. Within these challenges, the 'PRACTISE' Model provides a range of solutions to achieve more acceptable levels of alcohol associated risk and fewer alcohol related harms.

9.7 The ‘PRACTISE’ Model as Alcohol Policy Choice

9.7.1 Endorsement of the ‘PRACTISE’ Model

Before the ‘PRACTISE’ Model can be implemented across Australia, it has to be promoted to governments. Politicians and policy makers will need to be convinced that alcohol availability is contributing substantially to community and societal risk, and that alcohol related loss of control is prevalent. These crucial policy partners must be persuaded that vital goals for public alcohol policy are a reduction in overall alcohol availability and a reduction in aggregate consumption below current levels. For this aim to be achieved, the influence of the alcohol industry in seeking “to secure advantages in the marketplace” (Stockwell & Crosbie 2001, p. 148), and thus increase production and sales, requires robust challenge. The commercial interests and global organisations underpinning access to alcohol do not support a reduction in public availability, a principle of AT (Bruun et al. 1975), or help prevent loss of control, central to the TPB (Ajzen 1991; Ajzen & Madden 1986).

Other factors will influence uptake of the ‘PRACTISE’ Model. It may well be asked why the Model would be adopted by governments over other more traditional approaches to alcohol policy. “On the policy side, there are a host of competing claims for attention” (Weiss 1977, p. 533) and a host of alternate policy solutions to meet such claims. The Model is but one of numerous ways of conceptualising alcohol harms and alcohol associated risk. Endorsement of the Model will depend on what other policy frameworks are available and how demand for this particular policy ‘product’ unfolds. In its favour, the Model applies comprehensive evidence in the form of theory to the conceptualisation of alcohol risk and the development of alcohol policy. The Model is systematic in approach and simple in deliberation and can readily be applied at a number of levels of policy formulation and implementation practice. The Model balances competing alcohol

policy agendas and can help facilitate incremental policy change. In addition, the Model is amenable to alcohol policy refocus as well as to change in strategic action. The Model takes ‘perceptions’ into account, which may be easier and less costly to alter than the structural and environmental elements of change.

9.7.2 Alcohol Policy Opportunity

Opportunity to present the Model, as a viable policy alternative for Australia, depends on the policy position of the government of the day, political receptivity to policy redirection, and the perceived difficulties of building strong public policy within volatile economic markets and shifting community values. Alcohol problems are one of the most obdurate, with alcohol policy challenging to frame and demanding to implement. Consistent with this position, there are few ‘easy’ policy reforms remaining (Banks 2009). Policy reform, as sought through the Model, will likely be contested similar to other complex political agendas.

A robust policy framework, such as the ‘PRACTISE’ Model, is usually necessary to achieve transformational change but on its own is not sufficient (Edwards 2004). In today’s world of policy development, many clearly structured and evidence informed policies remain on departmental shelves, bereft of government attention. For evidence, integral to the Model, to be transformed into policy action “it needs to be the right evidence; it needs to occur at the right time, and be seen by the right people” “evidence is never absolute, never revealed truth” (Banks 2009, pp. 7, 15). How well evidence is understood and what counts as reliable evidence are never clear cut questions (Learmonth & Harding 2006). In accord, a range of other factors besides theory based evidence may sway government acceptance of the Model. These influences include the receptiveness of

the policy environment (Banks 2009), the ‘alignment of the policy planets’ (d'Abbs 2004), and the presence of extraordinary factors that enable or block the path of policy success.

Alcohol problems are controversial in policy framing, development and action; these issues preclude a definitive policy response. As one example, the recommendation not to drink alcohol in pregnancy is viewed by public health experts in Australia as a straight forward rejoinder to a clearly evidenced problem, based on recommendations to prevent a range of fetal alcohol spectrum disorders (National Health and Medical Research Council 2009). Alternatively, the alcohol use in pregnancy warning label agenda is considered by most sections of the alcohol industry as highly problematic amidst fears that labelling alcohol with health messages will damage the perceived efficacy of the product and associated profits. As another example, an increase in the legal drinking age from eighteen years to nineteen years is viewed by most young people as an unreasonable curtailing of freedom, especially when a number of other adult privileges are possible at the age of eighteen (Toomey, Nelson & Lenk 2009). Then again, an increased legal drinking age is evidenced to reduce harms and consequently benefit this age group (Stockwell & Gruenewald 2001). The Model could assist with these policy agendas.

An integrated framework, such as the ‘PRACTISE’ Model, provides relief to governments struggling with difficult policy agendas and seeking solutions to health and social concerns. But government policy positions are always shifting in response to new research findings, a fresh interpretation of ‘old’ evidence, or an innovative approach to a strongly established policy stance. Policy is by no means constant, but rather dynamic in nature (Hill & Hupe 2009), presenting further challenge for the ‘PRACTISE’ Model.

Investigations, such as those of this thesis, are specifically conducted to inform policy processes (Weiss 1977). But there can be limited government capacity to understand the

findings of policy related research (Edwards 2004). Nonetheless, these circumstances present opportunity for justifiable consideration of the ‘PRACTISE’ Model. The Model is elegant in conceptualisation and understandable in practice. The synthesis of evidence, together with the *Principles* and *Four Ways Risk Index*, renders adoption of the Model as a likely possibility. ‘Readymade’ goals and strategies are an advantage to governments wishing to save the costs of extended periods of strategy development and reduce the timeframe for public policy implementation.

9.7.3 Policy Governance for the ‘PRACTISE’ Model

Governance arrangements at national and jurisdictional levels are central to advancing the agenda of the ‘PRACTISE’ Model. Policy governance influences the achievement, or otherwise, of strategic outcomes. Policy governance constitutes all the systems, structures, functions and processes that would enable the realisation of the aims of the Model. Good governance creates opportunities for policy action (Hill & Hupe 2009). The success of the approach inherent in the Model will depend on environmental influences, including responsive policy governance (Rhodes 1997) and supportive political environments (d'Abbs 2004), as well as other relevant factors such community readiness for change.

Achievement of effective governance structures for the ‘PRACTISE’ Model will depend upon which government body realises overriding control of the national alcohol prevention agenda in the future and how influential such governance proves to be in forging national policy direction. The disbandment of the MCDS through government review leaves the IGCD with no direct Ministerial oversight. The Standing Council on Health (SCoH) currently assumes overriding responsibility for the alcohol and drug policy agendas. Of related impact, the alcohol industry continues to influence the policy outcomes of the

IGCD; the development of the next National Alcohol Strategy is hindered through unclear policy intent.

In these political and policy environments, uptake of the 'PRACTISE' Model will depend on the prevention agenda being successfully progressed by the SCoH and the Australian Health Ministers Advisory Council (AHMAC). Adoption by AHMAC of the public health and other population level agendas related to alcohol is a step in the right direction. The AHMAC Principal Committees of 'Australian Health Protection' and 'Community Care and Population Health' are central to the alcohol debate and to strong policy governance for population level problems. Whether the 'PRACTISE' Model is viewed as credible will also depend on the authority of the ANPHA over future national alcohol prevention initiatives.

The influence of the ANPHA on the alcohol agendas of Health Ministers and AHMAC Principal Committees will contribute to effective policy governance, important to the success of the 'PRACTISE' Model. Joined up actions between different policy sectors are fundamental (Anderson & Gual 2011). However, the current fixation of bureaucracy with connectivity between all policy streams and all policy agendas results in 'knotty' structures and convoluted processes, rather than functional policy networks. These entanglements constrain timely policy action and hinder strategic success. The bureaucratic culture of departmental restructures likewise limits the efficiency of how problems like alcohol are dealt with, and how quickly a response to new and emerging problems associated with alcohol and new and emerging products that contain alcohol can be actioned. Similar challenges would accompany the implementation of the Model.

If strong policy allegiances are formed in support of more acceptable levels of risk from alcohol and the prevention of associated harms, policy change, fundamental to the

‘PRACTISE’ Model, is the greater possibility. Within a policy networks approach, good governance for the Model will rely, to some extent, on support from alcohol policy coalitions. If these community based organisations accept the ‘PRACTISE’ Model as a credible alcohol policy framework, the alignment of government intent with the *Principles* of the Model could follow.

The influence of the alcohol industry on the forward agenda of the IGCD could deter serious consideration of the ‘PRACTISE’ Model. A reduction in the commercial availability of alcohol, as proposed in the Model, would likely be viewed by the industry as a threat to business viability. Any effort to alter drinker control could lead to a similar rejoinder. If the IGCD fails to concede that the prevention arm of the national alcohol agenda is better managed through public health and prevention related processes, a duplication of governance and policy effort related to alcohol will occur. A worthwhile solution to these issues can be reached if the ANPHA assumes overriding responsibility for the primary prevention of alcohol associated risk, consistent with the Model. The IGCD, together with the AHMAC ‘Mental Health and Alcohol and Drug Principal Committee’, could assume governance of the secondary prevention and alcohol treatment agendas.

How alcohol policy governance operates in the future will determine, to some extent, the timeliness of adoption of the ‘PRACTISE’ Model and the success of implementation. The recent halving of the number of Ministerial Councils in Australia will likely affect the quantity and form of alcohol issues reaching the national policy ‘table’ through the SCoH, and could influence how the Model is received at high government levels. Uptake of the Model will likely depend on whether the population level problems accompanying the use of alcohol receive the policy attention they deserve within national prevention agendas.

If public alcohol policy agendas and liquor licensing operations were to be shifted under the legal jurisdiction of Directors of Public Health across Australia, alcohol would be upheld as the threat to community health and safety that evidence confirms. Within these contexts, greater control of alcohol availability and supply could be possible as has occurred with tobacco, and greater control of alcohol advertising as has been achieved with sponsoring and promotion of tobacco products. At the jurisdictional level, the situating of statutory units such as Liquor Licensing Authorities in government departmental structures has ramifications for what can be achieved for public alcohol policy. In Victoria, Liquor Licensing and Regulation is situated within the Department of Justice; in Western Australia, the Department of Racing, Gaming and Liquor is responsible for liquor licensing and regulation. In Tasmania, the licensing of the sale of alcohol is regulated by the Department of Treasury; alcohol is viewed for the most part by the Tasmanian Government as a benefit to revenue, industry, commerce, tourism and economic development.

Of further import, international policy circumstances constrain or, alternatively, support local policy effort, which could influence governance arrangements for the 'PRACTISE' Model. The impact of the recently formed WHO Global Alcohol Strategy (World Health Organization 2010) on supply and demand for alcohol, and on alcohol policy in Australia, is largely untested. The WHO Strategy provides a number of policy options to regulate alcohol availability and strengthen policy leadership, health system responses and community action. The Strategy also acknowledges the rights of free trade, and concern for 'unjustifiable discrimination' against business enterprise and consumer choice, as a counterbalance to alcohol as a public health issue. This position is not entirely inconsistent with the Model. However, the 'PRACTISE' Model would deny any overall *increase* in

alcohol related business activity, yet defines effective policy responses to the availability and use of alcohol.

Nonetheless, the globalisation of public health has implications, not only for commerce, but also for public health governance (Taylor 2002). As an urgent response to the WHO Strategy, governments around the world, including the Australian Government, need to focus on international cooperation concerning health risks and opportunities and attend to “control over the transboundary forces that affect their populations” (Taylor 2002, p. 975). Stronger public health engagement in international trade agreements and alcohol related trade policy is warranted (Gleeson & Legge 2012) in the face of more aggressive marketing and promotion of alcohol products. Stronger public health participation in governance for alcohol policy is recommended, consistent with the ‘PRACTISE’ Model.

9.8 Barriers to Implementation of the ‘PRACTISE’ Model

Models of policy implementation such as the ‘PRACTISE’ Model are divisive, with little agreement forthcoming. Some public health officials could view the goal of limited availability as ‘too little too late’, and argue for immediate large scale reductions in alcohol availability. Alternatively, some groups in the community, especially seasoned drinkers, could view any restrictions on access to alcohol and alteration of drinker control as tantamount to creating a social ‘backwater’. The position of the Model is between these opposing viewpoints, with a goal of achieving moderate policy reform through incremental change over a number of policy cycles. In these ways, the Model represents a credible alternative to the present method of policy development in Australia, both costly to form and costly to implement.

Furthermore, specific policy problems and their solutions are embedded in wider sectors and systems such as the global economy, trade and fiscal policy (Potter & Harries 2006;

World Health Organization 2007a). Support or challenge from these systems to the achievement of good alcohol policy outcomes is acknowledged. Moreover, to achieve improved health and social outcomes from policy, more upstream development and change is needed in political, legal, commercial, and administrative structures (Potter & Harries 2006). These continue as part of the long term challenge surrounding alcohol as a legal product and for the 'PRACTISE' Model here presented.

There are a number of specific political, policy and social barriers that would hinder the successful implementation of the 'PRACTISE' Model. It is acknowledged that an alignment of the national and state policy 'planets' may be required to overturn these challenges, comparable with the advancements achieved in the Northern Territory (d'Abbs 2004) and akin to events that propelled Australia towards the first National Drug Strategy in the 1980s. Structural and social barriers to successful implementation of the 'PRACTISE' Model are identified as:

1. a population accustomed to the ready availability of alcohol - drinking is considered by many as a national 'pastime' and loss of control of alcohol is readily apparent;
2. a current Australian Government with variable success in relation to public alcohol policy - this situation may constrain the gains to be made through adoption of the 'PRACTISE' Model;
3. a national taxation system in need of structural reform related to alcohol – volumetric taxation for alcohol is yet to be introduced (Henry 2009);
4. the jurisdiction of National Competition Policy (NCP) over alcohol as a saleable product (National Competition Council 1995) - attempts to modify the public

availability of alcohol will confront the jurisdiction of the NCP in ensuring open competition in the marketplace;

5. the inclusion of alcohol in the calculation of the Consumer Price Index (CPI) - removal from the CPI is necessary for alcohol not to be perceived as an 'ordinary' consumable household good;
6. a current national alcohol policy statement (National Drug Strategy 2006) with limited impact on the risks and harmful consequences of alcohol availability and consumption - change is needed in the framing of the next iteration of national alcohol policy with regards to public availability and personal control;
7. an alcohol industry with persuasive influence on the direction of public alcohol policy – this situation requires substantial challenge;
8. a lack of a 'Declaration of Conflict of Interest' clause, both actual and pecuniary, as a prerequisite to participation in national and jurisdictional alcohol policy making - introduction of such a declaration would challenge the alcohol industry's participation in public alcohol policy processes and exclude those policy players whose allegiances are split between supporting better health outcomes for the population and engaging with the alcohol industry's agenda;
9. the gaps in the collection of alcohol wholesale sales data between jurisdictions (Hall et al. 2008; Loxley, Chikritzhs & Pascal 2009) - change to legislation is necessary in some states to enable Public Health Units to access and analyse these crucial data sets;
10. Public Health *Acts* not currently legislating with regard to the supply, demand and control of alcohol - reforms for tobacco, as another harmful product, can help inform how stronger Public Health legislation for alcohol can proceed.

9.9 Judging Success of the ‘PRACTISE’ Model

9.9.1 Evaluative Measures

Evaluation is a necessary stage of policy implementation. Analysis of data across a number of key indicators would reveal the impact of the ‘PRACTISE’ Model on risk and harms from alcohol. Publication of data trends, as evaluative measures, provides information to governments and communities regarding incremental policy gains. Trends in crucial alcohol indicators: mortality, aetiological fractions, hospital morbidity data, night time assaults, road crashes (National Drug Strategy 2001a); preventable mortality, burden of disease, disability adjusted life years (DALY’s); avoidable hospitalisations (Begg et al. 2003); and perinatal data (Li et al. 2011); can inform governments and policy units of the success or otherwise of strategic implementation. The appraisal of health strategies in general public policy is fundamental to change in health related indicators (Kickbusch & Buckett 2010), including those associated with alcohol. Trends in the granting of liquor licenses are also important in evaluation of the Model. Police data on alcohol associated violence, crime, accidents and suicide would help determine the Model’s effectiveness in achieving more acceptable levels of risk.

9.9.2 National Indicators

There are a number of indicators that confirm the progress of alcohol policy approaches, such as the ‘PRACTISE’ Model, in an Australian context. These indicators are:

- *A reduction in fiscal health and social costs related to alcohol* - as determined by detailed economic analysis. A reduction in the economic impacts of alcohol use would see costs diminish for governments and government departments, health and police, and communities and individuals. For the estimated costs of alcohol availability and consumption in Australia (Collins & Lapsley 2008) to significantly

reduce will take some time. The current level of alcohol associated harms for those other than drinkers (Alcohol Education Research Foundation & Turning Point 2010) will also take some effort to turn around and establish at lower risk levels.

- *A reduction in the population level availability of alcohol* - as measured by wholesale sales data. Currently alcohol wholesale sales data is not systematically collected or available to Public Health Units in all jurisdictions in Australia. The calculation of consumption levels relies on apparent estimates (Australian Bureau of Statistics 2010-11), self-report national survey data (Australian Institute of Health and Welfare 2011), and local data collections. Queensland, the Northern Territory, Western Australia (Loxley, Chikritzhs & Pascal 2009), and more recently the Australian Capital Territory (ACT) have developed systematic approaches to the analysis of wholesale sales data. South Australia is poised to follow. The provision of aggregate alcohol sales data to the Chief Health Officer together with sales postcode information, as occurs under legislative provision in the ACT (Australian Capital Territory Government 2010), lends opportunity for more reliable health policy and strategic planning for alcohol.
- *A reduction in Australia's annual per capita consumption by one litre* - to approximately nine litres of pure alcohol. International research reviewed in this thesis demonstrates strong associations between rises or falls in aggregate alcohol consumption by one litre of pure alcohol per capita, and a corresponding rise or fall in overall morality, alcohol related diseases and conditions, and acute events such as overall accident morality, traffic accidents, falls, homicides and suicides.
- *A significant reduction in alcohol associated harms* - informed by national household surveys, drug monitoring surveys, and other data sources. Currently, hospital admission data for alcohol associated acute incidents and chronic

conditions is inconsistently collected and analysed across Australia. Accurate recording of such data is not straightforward within health systems experiencing resourcing cuts, and Emergency Departments that are time pressured. Hospital coding methods can conceal alcohol associated disease and injury. This makes it difficult for an accurate picture to be gained of alcohol related harms and renders measurement of policy progress a reasonable estimate only.

9.9.3 Jurisdictional Contribution to National Indicators

At jurisdictional levels, availability and consumption of alcohol is locally influenced by liquor license approvals, hours and days of sale, the density of liquor outlets particularly in problematic drinking precincts, and the legal drinking age. These factors all contribute to the prevalence of alcohol related harms at national and more local levels. Alcohol associated harms are informed by jurisdictional specific results of national household surveys and drug monitoring surveys; emergency department and hospital admission data; road accident statistics; and police assaults, homicides, and suicide data. Surveillance of alcohol indicators is a key responsibility of a number of government departments as well as Public Health Units. Trends over time provide invaluable evidence of the success or otherwise of public policy implementation.

Trend analysis, based on the primary components of the 'PRACTISE' Model, will inform when adjustments are needed in strategic intervention. Analysis of population trends establishes the extent of alcohol sales and the prevalence of associated morbidity and mortality. Results are useful as leverage on governments to limit alcohol availability and reduce risky drinking behaviours. Consistent with the Model, redirection of alcohol policy at the jurisdictional level can be meaningful, like a cap on liquor licenses per head of population, or highly demanding, such as undertaking large scale legislative reform to

bring all alcohol associated *Acts* into policy synergy. The achievement of these objectives, as indicators of policy advancement, may be more challenging without the contribution of relevant theory to a public alcohol policy model.

9.10 The Contribution of Theory

Investigative findings, based on relevant theory, uphold an alcohol policy focus on limiting alcohol availability to the general public. As such, population level interventions and targeted strategies accommodate the crucial elements of AT (Bruun et al. 1975; Single 1988; Stockwell & Gruenewald 2001) and the TPB (Ajzen 1991; Ajzen & Madden 1986). Of particular policy potential, if actual availability proves hard to reduce in the near future due to industry influence on political and policy objectives, perceived availability could be open to more immediate change. Benefits are proposed from policy aiming to reduce the perception of alcohol as readily available, both situational and in general. This can be achieved through limiting access to alcohol, but also by modifying the subjective awareness of availability consistent with cue based research (Laberg 1986).

Risky drinking is difficult to modify in Australia as a result of current policy frameworks that maintain high availability and consumption, and predominant perceptions that sustain drinking behaviours (Livingston 2012; National Drug Strategy 2002). At least in the early stages of planning to drink, intentions and control of behaviour bring about the desired drinking experience, be that a glass of wine at home or catching up over a drink with friends. But for some drinkers, loss of control is an inevitable consequence of consumption (Room & Leigh 1992) or an intentional goal of use (Room & Makela 2000). In such circumstances, perception of control is more open to modification and proves an essential focus for future alcohol policy.

Consistent with planned behaviour theory (Ajzen 1991; Ajzen & Madden 1986), perceived control on the part of governments and policy experts over the political landscape is vital to adoption of a particular policy frame and the ease with which change can be progressed through a number of policy iterations. It is acknowledged that an *intention* to implement a policy of a certain frame is not tantamount to credible strategic development or desirable policy outcomes. Perceived control or loss of control of the political landscape by governments would likely result in a different policy frame and diverse implementation agendas. Knowledge for policy is never ‘clear cut’ or unidirectional, especially related to alcohol availability and behavioural control, recurring themes throughout this thesis. In the development of the ‘PRACTISE’ Model, other theories add to policy efficacy.

The ‘PRACTISE’ Model is a robust and integrated policy framework that, if implemented, could alter the alcohol use environment and the attributes of consumption behaviours. Even so, AT (Bruun et al. 1975) and the TPB (Ajzen 1991; Ajzen & Madden 1986) are not all-encompassing frameworks for policy and intervention. But, when combined into a hybrid Model, these theories represent an advanced position on public alcohol policy and an integrated approach to strategic action. Reference to AT and the TPB provides knowledge of how the alcohol use environment and behavioural attributes of consumption can be modified and rendered more conducive to acceptable levels of risk. Reference to theory gives hope of a renewed policy milieu where public availability and personal control are transformed to achieve a reduction in alcohol harms for the Australian population, as well as for those subpopulation groups most at risk from alcohol.

Chapter 10: Findings and Conclusion

10.1 Thesis Synopsis

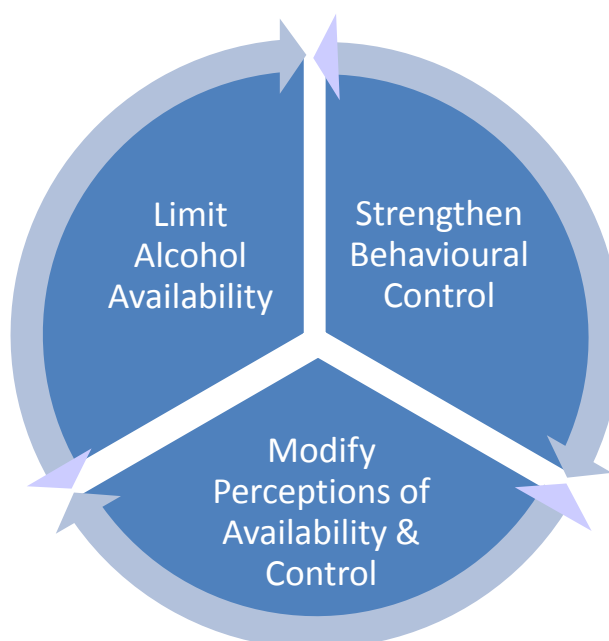
10.1.1 Summary of the Investigation

This thesis commenced with the proposition that public alcohol policy in Australia is in need of improvement. Policy resources have been directed towards alcohol problems over a number of decades, yet little advancement is evident. Alcohol is readily available and risk and harms are prevalent across the population. Consumption levels are cause for concern; alcohol related behaviours need confronting. Unclear government agendas, compounded by the involvement of the alcohol industry in policy direction, have resulted in less than ideal policy outcomes. The challenge in developing good public alcohol policy is acknowledged. The ‘PRACTISE’ Model offers solutions.

This thesis determines the ways that relevant theory can enlighten the framing, structure and implementation of public alcohol policy. A number of population based theories provide insight into the environmental context of alcohol use. A number of behavioural theories explain the attributes of alcohol consumption. Availability Theory (AT) (Bruun et al. 1975) and the Theory of Planned Behaviour (TPB) (Ajzen 1991; Ajzen & Madden 1986) emerge as the most comprehensive and powerful theoretical frameworks to inform alcohol policy. These theories, together with related research, enlighten public alcohol policy; other theories add to the knowledge. Actual alcohol availability, perceived alcohol availability, actual behavioural control and perceived behavioural control are integrated to frame a public alcohol policy model.

10.1.2 Primary Contribution of the Thesis

Figure 1: The ‘PRACTISE’ Model



The primary contribution of this thesis is the development of the ‘PRACTISE’ Model.

The Policy ‘Risk appraisal’ of Availability and Control to Increase Strategic Effectiveness (PRACTISE) Model represents a way forward for public alcohol policy in Australia. A number of primary *Principles* underpin the Model. The Model is represented in diagrammatic form to conceptualise an ideal *Public Alcohol Policy Framework*. A *Four Ways Risk Index* tests the potential efficacy and retrospective effectiveness of strategic interventions. *Universal Aims* and *Targeted Objectives* are part of the Model. The Model is extended to provide a suite of goals and strategies for implementation.

The Model represents an original contribution to the alcohol research and public policy fields. A framework for future public alcohol policy in Australia is thus formed. The Model, as based on theory and theory based concepts, provides to governments an alternative to current policy formulation for the intractable problems of alcohol. Reference to the ‘PRACTISE’ Model in policy development could assist in moderating intention to

drink at risky levels and help facilitate lower risk drinking choices. If adopted, the Model could propel Australian governments into previously uncharted territory with regards to alcohol policy framing, structure and implementation.

10.1.3 Related Contributions of the Thesis

In investigating the potential of theory to inform public alcohol policy, a number of relevant theories are identified consistent with key areas of focus: the environmental context of use and the behavioural attributes of consumption. Through analysis against select criteria, population and behavioural theories most relevant to public alcohol policy are identified. This type of investigative process is new to the alcohol policy area and to the alcohol research field. Through analysis of AT and related research, alcohol availability is identified as pivotal to all alcohol use and associated harms. Analysis of the literature related to ‘perceived availability’ reveals strong associations with demand for alcohol. This thesis demonstrates a process for the analysis of perception related research, not undertaken previously in relation to alcohol policy. ‘Perceived availability’ is established as a significant predictor of alcohol risk and alcohol outcomes alongside ‘actual availability’, further confirming the significance of availability factors to the consumption and harms from alcohol. A new course of action for public alcohol policy and a public alcohol policy model is thereby developed.

Analysis of the literature related to alcohol specific actions and the TPB reveals further policy potential. This investigation is new to the alcohol policy and alcohol research fields. Analysis of TPB variables reveals ‘perceived behavioural control’ as a strong and reliable predictor of risky drinking behaviours, as is ‘actual behavioural control’.

‘Intentions’ are significant with behaviours directed towards intoxication and drunkenness.

‘Subjective norms’ contribute to alcohol use and risky consumption behaviours, but to a

lesser extent overall than perceptions or intentions. These alcohol specific findings associated with the TPB build on the analysis of general behaviours by Armitage and Conner (2001) and Godin and Kok (1996). As a new area of inquiry, the contribution of TPB variables to the prediction of alcohol use and harms is at a level that can readily inform public alcohol policy and a public alcohol policy model.

10.2 Implications of Thesis Findings

If the 'PRACTISE' Model, as a frame for alcohol policy in Australia, gains support from governments, national prevention agencies and alcohol policy communities, implementation could follow. With limited availability, the majority of drinkers will likely perceive that alcohol is not so accessible, with some effort required to access and purchase the product. In addition, if drinkers' behavioural control is able to be strengthened, perceptions of control may also modify to safer responses. Moreover, policy that seeks to modify perceptions of availability and perceptions of control, in conjunction with changes to actual availability and actual control, could achieve substantial gains. This approach is of particular import to at risk drinkers, where loss of control is an issue and where the ready availability of alcohol is a compounding risk factor. Taking these potential benefits into account, adoption of the 'PRACTISE' Model for public alcohol policy will assist in realising limited alcohol availability and safer drinker behaviour, commensurate with more acceptable levels of risk.

In accord with the outcomes of this thesis, public alcohol policy would better be designated as *National Health and Social Alcohol Policy* to clarify government purpose in relation to availability, supply, demand and harms. The 'PRACTISE' Model informs such a policy agenda. Accordingly, a public health approach to the prevention of alcohol risk and harms is the most effective means to achieve health and social reform for Australia.

Strategies consistent with this direction will ensure market interests are not imposed on the health related alcohol agenda; industry concerns and business profits are better dealt with in other political and fiscal frameworks and other national policy contexts. However, it is unlikely that the availability of alcohol can be contained to safer limits within the current provisions of National Competition Policy (NCP) (National Competition Council 1995). If the health of the general public is not to be compromised by alcohol, the principles of NCP need be considered subordinate to public health precepts and practice. A public health approach to alcohol must essentially promote and protect the health and wellbeing of the community and make healthy choices easier (Marteau et al. 2011). At present, free and open competition brings a level of harms to the general public and vulnerable groups in the community. In order to inform public policy, the way alcohol, with addictive properties, performs in the marketplace needs careful consideration (Godfrey 1989).

What of the alcohol industry and their influence on adoption of the 'PRACTISE' Model? A declaration of 'Conflict of Interest' clause, excluding from public policy decision making those with pecuniary interests not consistent with a health and social wellbeing agenda, is essential. The interests of big business are more often at odds with a public health agenda (Herrick 2011). The health and social issues of national alcohol policy have been subsumed by international and national business from the 'big end of town'. Political concern for industry sustainability and the electoral 'bait' of increased employment through increased alcohol sales reduce public policy efficacy. Alcohol plays an ambiguous role in economic and social matters (Room & Jernigan 2000). Yet, public health partnerships formed in support of the prevention agenda have the potential to usher in a fresh policy era, where policy concern focuses on health protection and risk prevention and not primarily on a reduction in harms. The 'PRACTISE' Model informs this process.

10.3 Strengths and Limitations of the Thesis Inquiry

Knowledge of relevant theory, as evidence for policy, is demonstrated by this thesis. As the primary contribution of the inquiry, the 'PRACTISE' Model effectively integrates the significant variables of population level availability theory with those of planned behaviour theory. The Model is a template for alcohol policy, but could also help inform public policy for other health related issues. Alongside this strength, the analysis of theories with the potential to inform alcohol outcomes and alcohol policy represents a new approach to policy associated research. Evidence related to 'perceived alcohol availability' determines that perceptions of availability are important to alcohol outcomes and alcohol policy, alongside 'actual alcohol availability'. Likewise, analysis of alcohol specific research, based on planned behaviour theory, determines 'perceived behavioural control' as a pivotal variable in behaviours related to alcohol, alongside 'actual behavioural control'. Loss of control is identified as a common experience for population groups at risk. In these ways this thesis adds to the knowledge base of the environmental context of alcohol use and the attributes of consumption behaviours.

The 'PRACTISE' Model is yet to be introduced into the alcohol policy environment in Australia and yet to be evaluated for effectiveness in reversing the harms from alcohol. Although based on theoretical concepts, the Model's applicability to all alcohol outcomes and all alcohol policy could be open to challenge. Mixed methods are employed throughout the thesis; a number of different types of analyses contribute to thesis findings. Many of these are unique to this investigation. Further challenge to the 'PRACTISE' Model could be forthcoming from policy focused academics, due to a considerable reliance on research not based in Australia. Yet, analysis of American based studies of 'perceived availability' is necessary; there is a lack of similar research conducted in

Australia. In a comparable way, most studies of planned behaviour theory originate in other countries and are not locally evidenced.

The research analysed in relation to perceptions is, of necessity, based on subjective judgments of participants and therefore open to diverse interpretations. Yet, limitations are similar to those of other investigations that rely on self-report methods. As is the case with much research, many of the studies analysed for alcohol outcomes and alcohol policy are university or college based. A number of studies investigate the drinking styles and alcohol perceptions of young people. These methods represent a possible bias in results. However, findings of studies involving, primarily, young people do not differ significantly from investigations of other age cohorts. The age range of analysed studies is considered representative of drinking behaviours and alcohol harms across the age spectrum. Both perceived alcohol availability and perceived behavioural control are significant indicators of alcohol consumption and drinking outcomes for all age groups. This finding is one of the contributions of the thesis. As a consequence, there are many positive implications associated with this thesis and many opportunities for additional alcohol policy research.

10.4 Recommendations for Future Research

It is recommended that research funding be applied to extend the investigation of this thesis. As linked concepts, the relationships between alcohol availability, behavioural control, perceptions and alcohol related risk require additional research. Australia provides a rich environment to investigate drinking choices and consumption behaviours. Behavioural responses and drinking decisions are diversified across the population. The settings where alcohol is available to access, purchase and consume are many and varied. Few studies have been conducted in Australia applying AT (Bruun et al. 1975; Single 1988; Stockwell & Gruenewald 2001) or the TPB (Ajzen 1991; Ajzen & Madden 1986) to

alcohol consumption or particular populations at risk. But there is enough convincing evidence from research in other countries to justify further exploration of these associations.

As a concept discussed in this thesis, the level of alcohol related risk acceptable to the Australian community requires investigation. Of related importance, the extent of general and situational availability representing limited risk can be researched. If the most effective combination of type, number, and density of liquor outlets per head of population is established in support of safer alcohol environments, the concepts of population and situational availability could be better informed. Further investigation into opening and closing times of liquor outlets would add to the knowledge of the prevention of risk and alleviation of harms. Relationships between hours and days of sale and perceived availability require a specific research focus; this important area of knowledge is not well established.

In conjunction with these recommendations, the extent of drinkers' loss of control is another research prospect. Differentiation of Australian drinkers with control problems from those with safer behavioural control can then be more accurately defined. Variation in alcohol intentions is apparent in relation to styles of drinking; this represents a potential research opportunity. Investigation of determinants of decision making when drinkers are intoxicated and nearing a state of uncontrolled drunkenness is an associated research prospect; a study of this design could threaten the safety of investigators if researched in risky drinking settings. Further understanding of the protective effects of perceived alcohol availability and perceived behavioural control, consistent with lower risk, is necessary. If these important research questions are progressed, knowledge of the alcohol risk environment and evidence for public alcohol policy will be strengthened.

10.5 Further Development of Availability and Planned Behaviour Theory

The foundations of a hybrid theory, combining alcohol availability and behavioural control, are established in this thesis. It is apparent, from the investigation of AT (Bruun et al. 1975; Single 1988; Stockwell & Gruenewald 2001) and the TPB (Ajzen 1991; Ajzen & Madden 1986), that enhancements to these theories are possible. AT represents population harms resulting from availability and consumption. These relationships are evidenced in local environments and community settings, as explained in *Chapter Five*. The addition of the *perceived availability* variable could improve the effectiveness of AT to explain risk and harms from alcohol. The TPB can be enhanced, consistent with thesis findings, and made more applicable to alcohol use behaviours, as found by others (Armitage et al. 1999; Kuther 2002). Were *actual control* more overtly conceptualised in the research analysed in *Chapter Six*, the strength of TPB in predicting alcohol consumption and related consequences may have been further evident. Alcohol policy could stand to benefit.

There is advantage in integrating an enhanced model of AT with an enhanced model of TPB in development of a hybrid theory of alcohol use and alcohol policy. Such a framework would better explain and predict the risks that ensue from alcohol availability and behavioural loss of control in drinking contexts. Thus, the alcohol use environment and the attributes of consumption behaviours can be strongly represented from a theoretical perspective. A newly developed theory might also predict alcohol related risk for vulnerable populations. Development of an integrated theory for alcohol policy is beyond the scope of this thesis, but the research foundations are accomplished here.

10.6 Closing Comments of the Thesis

Findings of this thesis show potential to impact on the development and implementation of future public alcohol policy in Australia. Adoption of the 'PRACTISE' Model could significantly progress the alcohol policy agenda. With modification, the Model could be used to further prevent risk from other legal substances such as tobacco. Government policy for illegal substances like amphetamines and cocaine could also benefit, dependent upon the respective roles of availability and behavioural control in the development of associated harms. In addition, the Model has application for other social problems, like gambling and excessive food consumption, where availability and behavioural control can be in conflict. The main contribution of this thesis, the 'PRACTISE' Model, demonstrates the relevance of theory to health and social policy and to strategic intervention. Findings answer the primary thesis question in the affirmative: reference to theory can substantially inform a public alcohol policy model.

The relevance of Availability Theory (Bruun et al. 1975; Single 1988; Stockwell & Gruenewald 2001) to both general and situational access to alcohol is acknowledged. Likewise, the importance of the Theory of Planned Behaviour (Ajzen 1991; Ajzen & Madden 1986) to drinking behaviours is substantiated. The current investigation contributes to the conceptual debate regarding universal strategies and the need to make these more specific in order to bring about political and policy change. This thesis verifies that future public alcohol policy in Australia should place more emphasis on specific strategies for subpopulations at risk, as well as on risky drinking environments. Results indicate, by combining population theory and behavioural theory, more effective responses to health and social problems like alcohol are possible. This thesis makes a strong contribution to the alcohol research and public policy fields and to a potential reduction in alcohol associated risk and harms for Australia.

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