The Limit Maintenance Model:

Temptation and Restraint in Gambling

A thesis submitted in fulfillment of the requirements for the degree of Doctor of Philosophy

Robyn L. Maddern (B.A. Hons)

School of Psychology
University of Western Sydney

June, 2003

© R. L. Maddern 2003
Dedication page

For the 34 young adults who spoke so openly and honestly about their lives......
Acknowledgements

Doing this thesis has had an effect on a great number of people and a great number of people have had an effect on the thesis.

It is a daunting task to list all of those to whom I want to express my gratitude. Amongst them are those whose editorial skills were invaluable at the final draft stage; these include my sisters, Felicity, Lynda and Jenny and my friend and independent author Margot Shugg.

There were special people who supported and encouraged me during challenging times. Their generosity is woven into the very fabric of the thesis. These people include my friend and mentor Jim, my sister Felicity my friends in the ‘springboard group’, Karen whose sense of the ridiculous was a shining light, and others who lent their ears included Denise, Norman, my email pal Lisa, and my ex-partner Paul. In the final days I benefited from the strength of spirit and courage I observed in the inimitable Mr Brook.

My academic friends and associates who commented on drafts did so without the provisions of official supervision. Their gift moved the thesis ever forward to the final product. Their voluntary contributions are also woven into the fabric of the thesis. They include Dr Pat Bazeley, Dr John Hinkley, Prof Linda Viney and Dr Ken Rowe.

And of course, my official supervisor Prof Mark Dickerson took the whole journey with me. Mark managed the thesis process in a professional manner. His adept interpersonal skills unfailingly kept my focus on what was important. His warmth and compassion were a constant source of inspiration. With a lesser supervisor the outcome may have been different....... thank you one and all.
Research Funding

The data for this thesis was collected during a project jointly funded by the Casino Community Benefits Fund and University of Western Sydney. The Youth Gambling Report (Maddern & Dickerson, 1999) had six objectives ranging from identifying severity of impacts experienced by young people, to determining the likelihood of internet gambling, through to evaluating the effectiveness of school curriculum units as intervention. The Report describes the complexity of respondents’ experiences, imparted during 70 hours of dialogue with regular gamblers.
Statement of Authentication

The work presented in this thesis is, to the best of my knowledge and belief, original, except as acknowledged in the text. I hereby declare that I have not submitted this material, either in whole or in part, for a degree at this or any other institution.

...........................................

Robyn L. Maddern
Table of Contents

Appendices ix
List of Tables x
List of Figures xi
Abstract xii

CHAPTER 1: THE PROBLEM 1
Statement of the problem 2
What is being studied and why 2
Personal motivation and thesis overview 3

CHAPTER 2: YOUTH GAMBLING LITERATURE 7
Participation 7
  International data 7
  Age, access and preferred form of gambling 8
Australian data 11
Measurement of Harm 17
  Measurement principles 18
  DSM measures 20
  Harm: Australian problem gambling 26

CHAPTER 3: THEORETICAL EXPLANATIONS OF YOUTH GAMBLING 35
DSM approach 35
  Emotions/Arousal 35
    Developmental themes 38
    Delinquency 40
  Cognitive/Behavioural approaches 44
Australian problem gambling literature 45
  Developmental themes 45
Cognitive approaches 47
  Skill based attributions – Illusion of control 48

Summary 50

Australian approach to impaired control 52
  Choice control and context 54
  Measuring control 55
    Measuring Control by time and money 55

CHAPTER 4: METHODOLOGY 60

Conceptual method 61

Mixed methods 63
  Grounded theory and qualitative analysis 65
  Study design 67

Study rationale 68
  Design considerations 69

CHAPTER 5: THE LIMIT MAINTENANCE MODEL 71

Introduction to Study 1: The Qualitative Study 71
  Research aims and methodological considerations 71
  Model orientation 72

Procedural method 74
  Ethics Clearance 74
  Semistructured interview design 74
    Data Collection 75
    Sample Composition 75
  Analytical procedure 76
    Writing qualitative studies 76
  Analytical Strategy 77
    Step 1: Key characteristics that influenced self-control 77
    Step 2: Three stage process of control impairment 77
Step 3: Group outcomes
Step 4: Understanding findings as a function of self-regulation
Demographic data
Gender differences

Results from the limit setting analysis
No Specific Limit Group (NSL)
Target Limit Group
Use of Current Cash Only
Single Revised Limit Group (SRL)
Awareness of money issues
Choice/Control
Revised Limit Group (RL)
Continually revises limit
Control Efficacy
Exceeding Target Limits
Broad Limits Group (BL)
Avoiding specifying Limits

Summary of findings from Stage 1

CHAPTER 6: DEVELOPING THE LMM - EMOTIONS AND HARMS

Stage 2: Emotional management
Stress
Guilt and depression
Summary of Stage 2

Stage 3: Gambling related Harms
Description of harms and frequency of reporting
Relational mapping of Harms to limit setting characteristics
Validation of Contingency regulated and Self-regulated groups
Sequential ordering of Harms as they were experienced
Basedata and risk level
Key Outcomes from the Qualitative Study (Chapter 6).
Research issues arising from the Limit Maintenance Model
CHAPTER 7: MEASURING AUTONOMY AND RELATED PSYCHOSOCIAL SKILLS

Introduction

Autonomy
Psychosocial development in youth gambling
   Erikson’s theory of development
Research aims and questions

Method

Procedure and data
Scored example:
Reliability
Validity
Sample
Analyses

CHAPTER 8: HOW DOES PSYCHOSOCIAL MATURITY AFFECT THE SUCCESSFUL SELF-REGULATION OF GAMBLING?

Results

Group differences
Demographics
Resolving stages
Negative and positive CASPM constructs
Harms
Individual profiles
Contingency regulated gamblers
   Julie
   Initiative
Utterances and scores
Manifestations of developmental stages in gambling behaviour 154
Psychosocial maturity ranking 155

Joseph 155
Hesitancy 155
Utterances and scores 156

Manifestations of developmental stages in gambling behaviour 157
Psychosocial maturity ranking 157

Tony 158
Industry 158
Utterances and scores 158
Resolution of stages 158

Manifestations of developmental stages in gambling behaviour 160
Psychosocial maturity ranking 161

Self-regulated gamblers 161
Jean 161
Initiative 161
Utterances and scores 162

Manifestations of developmental stages in gambling behaviour 162
Psychosocial maturity ranking 163

Belinda 163
Hesitancy 163
Utterances and scores 163

Manifestations of developmental stages in gambling behaviour 164
Psychosocial maturity ranking 164

Peter 164
Industry 164
Utterances and scores 164

Manifestations of developmental stages in gambling behaviour 165
Psychosocial maturity ranking 165
Discussion

CASPM subscales

Most active construct - Affinity and Isolation
Second most active construct – Autonomy and Constraint
Significant group differences – Initiative and Hesitancy
Significant group differences - Industry and Inferiority
Methodology evaluation
Implications for sustainable gambling

CHAPTER 9: TEMPTATION AND RESTRAINT IN GAMBLING

Introduction

Summary of Chapters 5 through 8
Rationale
Origins

Temptation and Restraint

Predictive power

Links to gambling

Method

Measure development
Govern
Emotion
Cognitive preoccupation
Restrict
Concern
Data collection, sample composition and ethics
Statistical strategy
Statistical analyses
Confirmatory factor analysis approach
Model of best fit criteria 194
Identification of saturated models 195
Measurement models 196

**Statistical Analyses** 196
- Prelis examination of distributions 196
- Psychometric properties and construct validity of the G-TRI 197
- Second order models 198
- Research aims 199

**CHAPTER 10: RESULTS AND DISCUSSION OF THE G-TRI** 201

**Sample characteristics** 201
- Participation rates 201
- Key demographics 203

**Background variables** 204
- Age 204
- Sex 205
- Area 206

**Criterion variables** 206
- Frequency 206
- Harm statements 207
- Demographic associations with Harm statements 210
  - Age 210
  - Sex 210
  - Area 210

**Psychometric properties of the G-TRI** 212

**Refining the instrument – Model fits 100-103B** 213
- Four factor measurement models for the G-TRI 214
Model 101 – 102  214
Model 103  215
Model 103b  215

Second order models  219
Correlations between criterion and background variables  219

Multiple regression analysis  220
Harms  221
Frequency  221

Summary of findings  222
Methodological considerations and future research directions  224

CHAPTER 11: DISCUSSION  226

Summarising the problem  226

The Limit Maintenance Model (Study 1)  228

CASPM (Study 2)  238

Temptation and Restraint (Study 3)  241

Limitations of the study  244
Study 1  246
Study 2  247
Study 3  249

Final comment on self-control  250

REFERENCE LIST  254
Appendices

Appendix 1: Australian Problem Gambling Harms, SOGS, SOGS-RA and DSM-IV-MR-J Items 281
Appendix 2: The South Oaks Gambling Screen and DSM-IV Survey Items 285
Appendix 3: Prevalence Rates from Youth Gambling Studies 288
Appendix 4: Items comprising the Victorian Gambling Screen 292
Appendix 5: Harm to Self Scale (Ben-Tovim et al., 2001) 295
Appendix 6: Factors Comprising the SEM model testing Jacobs General Theory of Addiction 297
Appendix 7: Study 1 Interview Questions 299
Appendix 8: Study 1 Sample Demographics 301
Appendix 9: Study 2 - CASPM Scored Interview Transcripts 303
Appendix 10: CASPM Examples of Scorable Phrases 306
Appendix 11: Summary of Formative Research for the TRI 308
Appendix 12: The Gambling Temptation and Restraint Inventory 312
Appendix 14: Study 3 – Youth Telephone Questionnaire 317
Appendix 15: Confirmatory Factor Analysis 333
Appendix 16: Regular Players: Common Gambling Forms by Demographics 335
Appendix 17: Syntax for the One-factor Congeneric Solutions 337
Appendix 18: Syntax for the G-TRI CFA Model 103b 339
Appendix 19: Covariance matrix to be analysed G-TRI CFA Models 341
Appendix 20: Multiple Regression Output (SPSS) 344
# List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1</td>
<td>Australian Youth Gambling Studies</td>
<td>13</td>
</tr>
<tr>
<td>Table 2</td>
<td>Population Estimates of Australian Youth Gambling</td>
<td>17</td>
</tr>
<tr>
<td>Table 3</td>
<td>Study Design and Data Collection</td>
<td>67</td>
</tr>
<tr>
<td>Table 4</td>
<td>Sex by Risk Level</td>
<td>80</td>
</tr>
<tr>
<td>Table 5</td>
<td>Key Limit Setting Characteristics of High and Low Risk Groups</td>
<td>103</td>
</tr>
<tr>
<td>Table 6</td>
<td>Strategies to Manage Moods</td>
<td>113</td>
</tr>
<tr>
<td>Table 7</td>
<td>Coping Strategies of Contingency/Self-Regulated Groups</td>
<td>116</td>
</tr>
<tr>
<td>Table 8</td>
<td>Likelihood of Reporting Harms</td>
<td>119</td>
</tr>
<tr>
<td>Table 9</td>
<td>Frequency of Reported Harms by Limit Setting</td>
<td>121</td>
</tr>
<tr>
<td>Table 10</td>
<td>Incidence of Harms for Gamblers and Their Partners</td>
<td>122</td>
</tr>
<tr>
<td>Table 11</td>
<td>New Clients: Problem Gamblers by Sex and Age</td>
<td>125</td>
</tr>
<tr>
<td>Table 12</td>
<td>Key Experiences of Epigenetic Stages</td>
<td>139</td>
</tr>
<tr>
<td>Table 13</td>
<td>CASPM Weightings Used In Study 2</td>
<td>142</td>
</tr>
<tr>
<td>Table 14</td>
<td>Mean Scores for Positive and Negative CASPM Constructs</td>
<td>147</td>
</tr>
<tr>
<td>Table 15</td>
<td>Means and Standard Deviations for Risk Groups</td>
<td>150</td>
</tr>
<tr>
<td>Table 16</td>
<td>Correlation Coefficients</td>
<td>151</td>
</tr>
<tr>
<td>Table 17</td>
<td>Correlations for Nonsignificant CASPM Subscales and Harms</td>
<td>152</td>
</tr>
<tr>
<td>Table 18</td>
<td>Highest and Lowest Scores On CASPM Subscales</td>
<td>153</td>
</tr>
<tr>
<td>Table 19</td>
<td>Factors Comprising The Temptation and Restraint Scale</td>
<td>181</td>
</tr>
<tr>
<td>Table 20</td>
<td>Significant Findings/Predictions from The TRI</td>
<td>183</td>
</tr>
<tr>
<td>Table 21</td>
<td>Participation Rates by Playrates and Population Equivalent</td>
<td>202</td>
</tr>
<tr>
<td>Table 22</td>
<td>Regular Gamblers; Population Estimates by Demographics</td>
<td>203</td>
</tr>
<tr>
<td>Table 23</td>
<td>Regular Gamblers; Average Session Spend by Demographics</td>
<td>203</td>
</tr>
<tr>
<td>Table 24</td>
<td>Regular Gamblers; Session Spend by Demographics</td>
<td>204</td>
</tr>
<tr>
<td>Table 25</td>
<td>Regular Gamblers; Categories of Reported Harms by Sex</td>
<td>209</td>
</tr>
<tr>
<td>Table 26</td>
<td>Harm Items Statistics by Demographics</td>
<td>211</td>
</tr>
<tr>
<td>Table 27</td>
<td>Means and Standard Deviations for the G TRI by Sex</td>
<td>212</td>
</tr>
<tr>
<td>Table 28</td>
<td>Results of CFAs for the G TRI Measurement Models</td>
<td>214</td>
</tr>
<tr>
<td>Table 29</td>
<td>Factor Loadings and Uniqueness for The 4 Factor Solution</td>
<td>215</td>
</tr>
<tr>
<td>Table 30</td>
<td>Latent Factor Correlations for The G TRI Scales</td>
<td>217</td>
</tr>
<tr>
<td>Table 31</td>
<td>Predictors of Gambling Harms</td>
<td>221</td>
</tr>
<tr>
<td>Table 32</td>
<td>Predictors of Gambling Frequency</td>
<td>222</td>
</tr>
</tbody>
</table>
List of Figures

Figure 1: Schematic overview of the Limit Maintenance Model 73
Figure 2: The Limit Maintenance Model 79
Figure 3: Harms reported by level of risk 120
Figure 4: Mean positive and negative CASPM scores by sex 148
Figure 5: Summed bipolar CASPM constructs 149
Figure 6: Hypothesised model schema 199
Figure 7: Participation rates by sex 205
Abstract

A literature review revealed the strong evidence that youth aged 16 to 25 years (World Health Organisation, 1989) in many jurisdictions world-wide report experiencing significant harmful impacts arising from gambling. The exact nature and prevalence of these impacts and the processes that underlie their origins remain obscure in part because of the common assumption that measures and criteria developed with adult populations may be applied to youth. Therefore, the approach adopted in this doctoral sequence of empirical studies was to focus on the core addictive construct of self-control (Heather, Miller & Greeley, 1991) using in the first instance a qualitative data analysis of 34 youth who gambled regularly at least once per week. The main cognitive themes from the interviews were used to develop a Limit Maintenance Model which outlined five qualitatively different approaches to the control of gambling.

Each of the subsequent studies tested and extended the Limit Maintenance Model using different methodologies. Study 2 examined an hypothesised relationship between limit setting ability and psychosocial maturity. Based on the developmental theories of Erikson (1959), Content Analysis Scales for Psychosocial Maturity (Viney, Rudd, Grenyer & Tych, 1995) were applied to interview texts and generated individual profiles of youth and their struggles with maintaining and relinquishing control of gambling.

In Study 3 the cognitive and emotional characteristics of gambling behaviour identified in the Limit maintenance Model were found to parallel the Temptation-Restraint concept of addictive processes in alcohol consumption (Collins & Lapp, 1992). Consequently, structural equation modelling techniques were applied to test the Temptation-Restraint concept in a large sample of youth gamblers. A measurement instrument was validated and established that control over gambling is multi-faceted, involving both a propensity to restrict participation as well as a tendency to splurge.

Two secondary goals of the sequence of studies were (a) to use a mixed methods approach in order to deliver a comprehensive solution to the problem, and (b) to choose methods and content that might best provide a basis for the development of interventions to assist youth gamblers experiencing gambling related problems. With
these aims in mind the three empirical studies provided a mixed-methods approach to identifying the cognitive, emotional and developmental barriers to self-control of gambling. In so doing, they emphasized the imperative for youth to embark on a learning process to ensure their self-regulatory skills are sufficiently developed to manage the temptation to gamble to excess, and instead, maintain self-controlled and safe gambling behaviours.

A schematic outline of the thesis is presented on the following page.
Chapter 1: The Problem

“It is difficult to reject the premise that the erosion of a person’s ability to control their time and money expenditure on gambling is central to a psychological understanding of the origins of the harm that can arise.”

(Dickerson & Baron 2000, p. 1149).
Statement of the problem

A young man is preparing to meet his friends at the club after a day at work. Before he leaves home he reassures his anxious mother/girlfriend that he won’t spend all his money on the “pokies”. When he arrives at the club he meets his friends and they have a few drinks. As the evening progresses his friends drift off to play the pokies. He goes with them, keeping in mind his budget for the night and that he also wants to keep a few dollars aside for drinks and cigarettes. He and his friends put a few dollars through the pokies with the intention of stopping and going back to the bar when they use up their remaining credits. When the credits have almost run out they have a small but surprising win. They are all excited and amazed. One young man wants to continue playing as this is shaping up to be a lucky night, and it has been a pretty bad week up until now. Another wants to cash in the win. Our young man with the budget is in turmoil, he would like to play more but knows that revising his limit is a dangerous move. What will be the outcome?

Gamblers face dilemmas like this on a regular basis. Will I be tempted to spend more than intended because I have had a win, or because I feel angry/depressed tonight? How long can I continue to gamble and still be able to walk away without losing all my money? Finding solutions to challenges like these is central to maintaining control of gambling. People who have failed to resolve these and other similar issues suffer a range of harmful consequences.

What is being studied and why

Just as excessive intakes of food, alcohol and drugs can be harmful, gambling is an addictive-like activity, and without sufficiently developed skill, has the potential to generate harmful events in the life of the individual and those around them. Given that one percent of adults in NSW experience significant financial, personal, work-related and relationship problems due to gambling (Productivity Commission, 1999), what then is the experience of youth who commence gambling before attaining the self-regulatory skills associated with adulthood?
Young adults aged 16 to 25 years have been identified as having the highest incidence of problem gambling (Gupta & Derevensky, 1998a). This age group is also undergoing one of the most challenging transitions they are likely to experience. Making the change from parent centred regulation to self-regulation involves grappling with issues such as autonomy and self-control, which are fundamental to the process of psychological development, and often occur in the context of extended periods of financial dependence on parents. If gambling is occurring during difficult developmental transitions what are the implications for maintaining control?

For some, control is relatively easy. Others have a more complicated relationship with addictive-like behaviours. The problem is to understand the complexity of gambling within the developmental context of the lives of young adults. Knowing the characteristics and processes of maintaining and relinquishing control can help the understanding of how self-regulation can be strengthened to prevent or reduce the severity of gambling problems. This is particularly vital given that the ease or difficulty with which control is maintained separates those who may experience harmful impacts and those who do not, and may therefore extend our knowledge of the learning processes involved in the personal development of sustainable or harm free gambling behaviour.

**Personal motivation and thesis overview**

The approach to the study of youth gambling arose as a result of the candidate’s work as a research assistant at the Australian Institute of Gambling Research in Sydney during 1995-1998. This included assisting in conceptualising and conducting eight government funded studies of adult gambling, spread across the states of Australia. Each of these studies, utilised a DSM derivative psychometric scale, most commonly the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987). The utility of this scale is debated in the literature as are the problems associated with its use. The twelve questions that make up the SOGS continue to be the basis for prevalence estimates (Productivity Commission, 1999).
During this period of research experience the gambling literature relied heavily on the mental disorders conceptualisation of the harmful aspects of gambling, whereby a label of pathology sanctioned loss of control of gambling as being beyond one’s personal resources. That is to say, there was a danger that some individuals could continue to see themselves as helpless to take control of their gambling because they had a disease or deficit that prevented them from doing so.

This thesis was an opportunity to question the notion of control at a deeper level. In the author’s work as a counsellor, clients who gambled revealed very personal thoughts and feelings during sessions. The richness of the information they imparted could not be overlooked, and it was clear that the psychometric scales used to measure problem gambling did not do justice to their agonising attempts to control their behaviour. Furthermore, how and why two gamblers’ experiences differ in similar circumstances is such a diverse and complex issue that an investigation required more than a single methodological approach. As the aim was to provide greater insights into the control process, it was necessary to utilise qualitative and quantitative methods of inquiry to thoroughly investigate the control process.

Multiple methods of enquiry approach the problem from a number of perspectives, and thereby provide comprehensive answers based on thorough investigative methods. The initial data set was analysed using qualitative methods, and was intended as the exploratory phase which led on to form the basis of two further studies, both using very different quantitative methods. There were three data sets analysed in all. Study 1 used a qualitative approach, Study 2 applied quantitative measures to qualitative data, and Study 3 used structural equation modelling to test the psychometric properties of an instrument developed in the thesis to measure control of gambling. Complete details of the sample, data collections and methods applied are provided in each of the respective studies’ procedural methods sections. A brief overview of each Study follows.

The data for Studies 1 and 2 came from the same set of 34 in-depth, semistructured interviews undertaken at gambling venues. For Study 1, the questions asked were designed to elicit information about how young people control their gambling and how and what factors impede their ability to control it. A number of themes around control emerged, and in particular, the relationships between psychological and social maturity
and control. Given that respondents were aged 16 to 24 years, it was appropriate to consider a range of developmental issues, and this led to the second study in which Erikson’s (1959) stages of development were applied to the relationship between psychosocial development and gambling problems.

Study 2 used content analysis, a quantitative approach to the analysis of qualitative (text based) data, in which a prescribed method of coding dialogue for five stages of development was used. Text based data is coded according to prescribed words and phrases that provide evidence of activity in each of the eight stages of development. The Content Analysis Scales for Psychosocial Maturity (CASPM) method was first developed by Viney (1983) and in subsequent use have been successful in predicting outcomes for delinquent youth in rehabilitation settings. In this study CASPM were used as a measure of individual differences to determine how important psychosocial maturity was to being able to control gambling. The key factor in Study 2 is that the measure of autonomy was applied to interview data that did not relate to gambling. Thus, the measure of autonomy is independent of the young person’s gambling habits of youth.

Study 3 was the natural culmination of Studies 1 and 2. It operationalised the key issues arising from Study 1 in a manner that allowed for the fluctuating control processes identified in Study 2. The joint outcomes from Studies 1 and 2 were consistent with a pre-existing psychometric scale called the Temptation and Restraint Inventory (Collins & Lapp, 1992). The scale was adapted for use as a gambling instrument, and was validated through structural equation modelling as a measure of successful and unsuccessful attempts to control gambling behaviour.

In Chapters 2 and 3 following, a review of youth literature is presented. The common themes, for example participation, age of access and gambling preferences are presented as they occurred in International and Australian literature. A large proportion of that literature is aimed primarily at prevalence estimation and pathology is assigned by screens derived from the early mental illness approach to gambling. The usefulness of such screens is discussed and contrasted with the Australian Problem Gambling approach to harms. The measurement of harms is discussed in some detail, because this thesis argues that continual and almost exclusive application of mainstream models
of gambling pathology impede researchers from discovering more about the nature of control over gambling.

Chapter 3 presents a review of youth gambling studies which have applied theoretical models of gambling behaviour. The paucity of such theoretical studies, the limitations of the screens derived from the mental illness model, and the developmental nature of youth, are the reasons for applying a grounded theory approach to the study of youth gambling. The strength of this approach, as argued in Chapter 3, will provide a model based empirically in an age-relevant group of regular gamblers.
Chapter 2: Youth gambling literature

Participation

International data

Much of the international literature to date has focused on determining prevalence rates of pathological gambling. Prevalence rates specify the proportion of a specified population meeting a pathology criterion, as measured by versions of DSM (APA, 1980) and derivative instruments. Embedded in prevalence studies one can usually find participation rates of some kind, which measure current gambling behaviours. In a review of studies of predominantly older youth, chosen for their robust sampling characteristics, past year gambling participation rates ranged from 51% in the UK to 87% in the US, closely mirroring the findings from a National US study reporting that between 52% and 89% of youth have gambled in the past year (NRC, 1999).

In a large stratified UK sample of adolescent students 51% had gambled in the past year (Fisher, 2000). In recent Canadian surveys estimates of adolescents having gambled during the past 12 months ranged from 80% (Gupta & Derevensky, 1998a) to 43% (Wiebe, Cox & Mehmel, 2000). In a much larger student sample including some 18 year olds, 77% had gambled during the past 12 months and 13% gambled weekly (Ladouceur, Boudreau, Jacques, & Vitaro, 1999a). Derevensky and Gupta’s (2000) study of youth (mean age of 18.5 years) reported a lower estimate again with 71% gambling participation during the past 12 months. In the same study, the participation rate for gamblers aged 18 years and older was 56.6% and was higher than estimates derived from predominantly adolescent (underaged) samples. In two random studies of youth first administered in 1989 and again in 1996, past year participation rates rose from 54% to 63%, concurrent with an age increase of approximately three years (20.7 years in 1989 and 23.5 years in 1996; Ladouceur, Jacques, Ferland, & Giroux, 1999b).

In the US a meta-analysis of 11 primary studies (1985 to 1993) predominantly with adolescents (aged 13-20 years) showed that between 77% to 83% had engaged in
some form of gambling behaviour (Shaffer & Hall, 1996). In a compilation of 20 independent prevalence studies of adolescents during 1984 to 1999, the 1984 lifetime rate from the US sample was 45% and in the later studies in 1999, 66% of the same US sample reported having gambled during their lifetime (Jacobs, 2000). In an older youth sample comprised of university undergraduates and full-time and part-time workers (aged 19-22 years) 87% had gambled in the previous 12 months (Winters, Bengston, Dorr & Stinchfield, 1998). In a three wave longitudinal study, youth were assessed 3 times during the period 1990-1998. The average ages at each response time were 16, 17 and 23.8 years respectively. Weekly gamblers accounted for between 13% and 18% of the samples (Winters, Stinchfield, Botzet, & Anderson, 2002).

As can be seen, participation rates vary considerably and are influenced particularly by the sample characteristics of temporal groupings and age. In adult studies participation rates are measured in a weekly timeframe. Because adolescent studies usually have insufficient numbers to warrant a weekly player category, they have been reported in larger increments, fortnightly and monthly for example.

**Age, access and preferred form of gambling**

An influential factor is age of onset and its correlation with gaining access to legal gambling venues. One of the earliest questions arising in the literature is whether or not early onset of gambling is associated with greater problems in adulthood. The majority of researchers have accepted this tenet based on clinical evidence provided by adult problem gamblers who recall commencing gambling at a very young age. It has become a controversial topic with some research findings pointing to generally declining age of onset (Ladouceur et al., 1999b; Hardoon & Derevensky, 2002), whilst others have found the reverse (Moore & Ohtsuka, 1997; Winters & Anderson, 2000).

The age of onset of gambling behaviour cannot be considered in isolation from ease of access to gambling products. In discussing the link between accessibility of gambling products and problems, the Productivity Commission Report (1999: 8.1) concluded:
“...there is sufficient evidence from many different sources to confirm a significant connection between greater accessibility – particularly to gaming machines – and the greater prevalence of problem gambling.”

The Report also noted that access to gambling has four aspects. The first was proximity to a gambling venue, the second was the appeal and ease of use of products, the third was the conditions governing gambling venues and the fourth, the availability of the initial outlay necessary to gamble. Because of the relationship between new problem gambling clients and geographical placement of gaming machines (Thomas, Jackson Crisp, Smith, Ho & Borrell, 1998, cited in the Productivity Commission Report, 1999), proximity has been well established as a mitigating circumstance in increasing levels of reported problem gambling. For youth, not only proximity to a gambling venue, but how easy a product is to use and understand may be particularly important access issues, as well as having readily available funds to use. Together these factors are likely to have a strong bearing on how early in life gambling commences.

The early onset of gambling is a theme that has been taken up particularly in the UK where liberal age restrictions provide children of all ages with easy access to some gaming machines. In the UK these machines are know as fruit machines and in this thesis are noted as (fruit) to avoid confusion with adult only gaming machines. In the UK gaming machines (fruit) are legally available to youth of any age, some with cash payouts as high as £15. For further detail refer to Griffiths (1993) and Fisher (1999).

Youth in the UK grow up in a considerably different gambling culture to Australian Youth. In Australia, as in Canada and the US, any form of commercial gambling is illegal up to the age of 18 years (21 years in three US states) except the purchase of lottery type products. The quintessential factor is the enforcement of conditions governing the gambling venues – the regulations prescribed by gaming legislation, existing expressly to prevent access to youth younger than 18 years of age. In Australia regulations on age restraints for commercial gambling are strictly enforced (Victorian Casino & Gaming Authority, Guidelines for the enforcement of age restrictions in gambling) and opportunities for adolescents to gamble on commercial premises are very limited.
Because gaining access to gambling venues is a crucial aspect of gambling and developing gambling problems, Winters et al. (2002) have rightly pointed out that the characteristics and predictors of gambling will differ with age as the legal status of access changes. One characteristic that differs is the preferred form of gambling. As the average age of the sample increases towards 18 there is also an increase in preferences for electronic gaming machines. The most popular form of gambling undertaken by 67% of young adults aged 17 to 22 years was gaming machines followed closely by lotteries with a participation rate of 63% (Winters et al., 1998). For youth aged less than 16 years participation rates are highest for cards and games of skill (Jacobs, 2000; Stinchfield, 2000). Lottery products increase in popularity as adolescents approach 16 years of age.

In the UK the situation is quite different. Preferences for cards, games of skill, and lottery products ranged between 53% and 40% of youth respectively with instant scratchcards at 20% (Fisher, 1999). The most popular form of gambling amongst adolescents is gaming machines (fruit) with estimates ranging from 66% (Wood & Griffiths, 1998) to 75% (Fisher, 1999) of adolescents having played at some time during their adolescent life. Gaming machines (fruit) are, of course, the most popular choice of adolescent problem gamblers with 62% playing gaming machines (fruit) and 21% playing both gaming machines (fruit) and national lottery scratchcards (Fisher, 2000).

UK adolescent samples report similar findings to US youth samples in that they share a preference for gaming machines, and this is likely to be an outcome of the differing regulations. Where access is less restricted (i.e. the UK) there is a stronger and earlier preference for gaming machines. A strong case for this trend was presented by a longitudinal study documenting a shift in gambling preference away from informal private games to legalized games as youth mature (Stinchfield, 2002). In Australia, samples containing underaged respondents reported pools, cards, lotteries, scratchcards, games of skill, sports betting and raffles were the most popular activities (Maddern 1996; Moore & Ohtsuka, 1997; Scannell, Quirk, Smith, Maddern & Dickerson, 2000; The Victorian Government Department of Human Services, 2000). These activities, for the most part, occurred outside commercial gaming venues. One Australian study (ACOSS, 1997) reported that no underaged youth in their sample had used gaming machines. These findings align the Australian context with that of Canada and the US in which the
activities of youth aged less than 18 years are predominantly limited to informal, private gambling (Stinchfield, 2002).

Preferences and frequency of play vary from country to country and also due to multiple aspects of the sampling frame. The influence of age and access on gambling estimates are just two of a number of problems. Variation in the way that gambling products are grouped means that even within the same country the category of lotteries may or may not include instant lottery scratchcards, for example. Variations in products between countries notwithstanding, is someone who purchases a raffle ticket each week but has no other gambling expenditure a regular gambler? The broad definitions of gambling in common usage, i.e. "to risk anything of value [usually money] on a game of chance or the outcome of any event involving chance in the hope of profit" (Arnold, 1977:p8) have tended to mean that such a person is included. Hence the very real need to outline weekly participation rates according to form and to distinguish between noncontinuous and continuous forms of gambling (Dickerson, McMillen, Hallebone, Volberg, & Wooley, 1997a). The latter permitting continuous sequences of stake, determination and play (e.g. egms, betting, casino table games) and significantly associated with harmful impacts (Productivity Commission, 1999). When this is borne in mind the predominance of gaming machine play amongst youth samples is a cause for concern.

**Australian data**

In Australia the commencement of youth gambling research has been relatively recent. During the period 1994-1998 Dickerson and colleagues conducted studies in five of the seven Australian states (and one territory). These studies were either random door-knock or telephone interview samples, and were stratified to population demographics. The age frame in each study included a representative group aged 18 to 24 years, from which participation data and preferences were collected. Of particular relevance are the two identical studies conducted in New South Wales (Table 1, page 13) in 1995 and repeated again in 1997. New South Wales provides a benchmark for gambling studies by virtue of being the most populous and wealthy of all Australian states with greatest density and total number of gaming machines (Productivity Commission, 1999).
Included in Table 1 are studies in which explicitly youth data (aged up to 25 years) was able to be extracted - this is not the case in all other Australian studies. Studies focussing specifically on youth include those published by Moore and Ohtsuka (1997, 1999a, 1999b and 2000), and three reports, one commissioned by the Victorian Government Department of Human Services, entitled "The Impacts of Gambling on Adolescents and Children" (Thomas et al., 2000), the second, The Australian Council of Social Service Report entitled “Youth, Gambling and the Internet” (ACOSS, 1999), and the third study "Youth Gambling" (Maddern & Dickerson, 1999) commissioned by the New South Wales Casino Community Benefits Fund.
Table 1: Australian Youth Gambling Studies – New South Wales

<table>
<thead>
<tr>
<th>Study/Author(s)</th>
<th>Sample characteristics</th>
<th>% with gambling problems; screening instrument</th>
<th>Participation rates</th>
<th>Preferences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dickerson &amp; Colleagues, 1995</td>
<td>Portion of sample aged 18-24=179. Random, stratified</td>
<td>SOGS 10+ = 5%</td>
<td>Weekly 26.3%</td>
<td>Card Machines 20.1%. Lotto/Oz Lotto 15.1%.</td>
</tr>
<tr>
<td></td>
<td>door-knock survey.</td>
<td>5+ = 13.4%</td>
<td>Monthly 26.3%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yearly 31.8%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nonplayer 15.6%</td>
<td></td>
</tr>
<tr>
<td>Dickerson &amp; Colleagues, 1997</td>
<td>Portion of sample aged 18-24=153. Random, stratified</td>
<td>SOGS 10+ = 0%</td>
<td>Weekly 22.2%</td>
<td>Card machines 15%; Instant Lottery 7.2%.</td>
</tr>
<tr>
<td></td>
<td>door-knock survey.</td>
<td>5+ = 2.6%</td>
<td>Monthly 23.5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yearly 27.5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nonplayer 26.8%</td>
<td></td>
</tr>
<tr>
<td>Youth Gambling Madder &amp;</td>
<td>N=1008 stratified, random telephone and school survey,</td>
<td>Regular players 1/month or more often.</td>
<td>75% of the sample had current gambling</td>
<td>Egms for males (46.5%) and females (43.8%)</td>
</tr>
<tr>
<td>Dickerson, 1999.</td>
<td>aged 16 to 24 years.</td>
<td></td>
<td>experience.</td>
<td>followed by Lotto and Lottery products for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Regular 22.4%; infrequent 34.6%; occasional 17.9%;</td>
<td></td>
<td>males (20.7%) and Instant Lottery for females</td>
</tr>
<tr>
<td></td>
<td></td>
<td>nonplayer 24.3%; no response 0.8%.</td>
<td></td>
<td>(14%).</td>
</tr>
<tr>
<td>Modelling Youth Gambling, 1996</td>
<td>N=286 15 to 24-year-olds high school and under-graduate</td>
<td>Not collected.</td>
<td>60% of the sample gambled 1/month or</td>
<td>Favourite form for regular players was Scratch</td>
</tr>
<tr>
<td>Maddern.</td>
<td>students.</td>
<td></td>
<td>more often and included high school</td>
<td>&amp; Win Tickets (88%) and Raffle Tickets (86.7%).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>students (86%) and university students</td>
<td>Girls spend an average of $2.48 per week,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(14%).</td>
<td>whereas boys spend around $3.17.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>28% of adolescent boys gamble weekly or</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>more often.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>42% of girls gamble once per month or</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>more often.</td>
<td></td>
</tr>
<tr>
<td>Study/Author(s)</td>
<td>Sample characteristics</td>
<td>% with gambling problems; screening instrument</td>
<td>Participation rates</td>
<td>Preferences</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------------</td>
<td>---------------------------------------------</td>
<td>---------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Victorian Government Department of Human Services, 2000.</td>
<td>Three data sets: The Gatehouse Survey - Stratified, random sample of 2,788 Year 8 students. Student focus groups – 146 16-20 year olds. 220 clients of the Break-Even Counselling Service aged 18-24 years (some by estimation).</td>
<td>DSM-IV used to diagnose problem gambler clients. 78.5% reached criteria (cutpoint of 5) for pathological gambling. Problem gambler clients aged 18-24 years experienced intrapersonal problems (46.8%), leisure use issues (42.7%) and interpersonal issues.</td>
<td>Gatehouse survey: 41% of Year 8 students gambled in some form over the past 12 months. 8% engaged in 3 or more types of gambling in the past 12 months. Higher focus group participation amongst the 18-20 year olds.</td>
<td>Of the problem gambler data set, horse racing and card games were the preferred forms with median amount spent being $250 and $200 respectively. Electronic gaming machines attracted the largest number of people (150) followed by betting on the races (34 people).</td>
</tr>
<tr>
<td>Moore &amp; Ohtsuka, 1997.</td>
<td>1017 secondary schools students and first year undergraduates aged 14-25. Mean age 17 years, (SD = 1.9)</td>
<td>Modified version of SOGS on a 5-point Likert Scale, strongly agree to strongly disagree. Used as continuous variable, no cut-points applied</td>
<td>The majority of young people had experienced gambling within their family (67.7%) and among most of their friends (55.3%).</td>
<td>Regular gamblers (&gt;1/month) bought Lottery Tickets e.g. Tattsotto 14.1%; bet on Pool or other games of skill 13.6%, and bet on Sports 8.8%.</td>
</tr>
<tr>
<td>Moore &amp; Ohtsuka, 1999a.</td>
<td>215 Australians aged 17-55 years. (As for Moore &amp; Ohtsuka, 1997). 1017 secondary schools students and first year undergraduates aged 14 to 25 years. Mean age 17 years.</td>
<td>Modified version of SOGS on a 5-point Likert Scale, strongly agree to strongly disagree. Used as a continuous variable, no cut-points applied</td>
<td>The majority of young people had experienced gambling within their family (67.7%) and among most of their friends (55.3%).</td>
<td>Regular gamblers (&gt;1/month) bought Lottery Tickets eg Tattsotto 14.1%; bet on Pool or other games of skill 13.6% and bet on Sports 8.8%.</td>
</tr>
<tr>
<td>Moore &amp; Ohtsuka, 1999b.</td>
<td>769 youth aged 15 to 18 years. Mean age 16.3 years. Volunteers from 5 secondary schools in Melbourne’s western suburbs.</td>
<td>SOGS: modified version. Boys scoring: 2-4 potential problems =16.3%, and potential problem gamblers 2.9%. Girls potential problems 4.8%, potential problem gambler 1.4%</td>
<td>Only 11.3 % of the sample (8.3 % boys and 13.7 % girls) had never gambled for money, that is, nearly 90% had gambled at least once.</td>
<td>Regular gamblers (&gt;1/month). Boys: Pool 20.3%; Cards 17.7%, Lotteries 10%. Girls: Lotteries 12.3%, Scratch-It-tickets 8%, Cards 5.3%.</td>
</tr>
<tr>
<td>Young people, gambling and the Internet. ACOSS 1997.</td>
<td>114 10 to 21-year-olds with bias in 14 to 17 years age group.</td>
<td>Minors had not gambled on egms; all aged 18 years and over had played egms at some time.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Australian data contains two adolescent samples. In a survey of 79% of all year 8 students in Victoria (mean age 14 years) undertaken by the Department of Human Services (Thomas et al., 2000), 41% had gambled during the past 12 months. In an older adolescent sample (15 to 18 years), Moore and Ohtsuka (2000) showed that in using a lifetime rate, 89% had gambled in some form. In yet an older student dataset (age range 15 to 24 years), a weekly participation rate of 28% was reported which was comprised of males only (Maddern, 1996). A more reliable finding comes from the large, random, stratified sample which reported 13.3% of 16 to 24-year-olds gambled once a week or more often (Maddern & Dickerson, 1999). The two datasets of 18-24-year-olds (Dickerson et. al., 1996; Dickerson et. al., 1998) returned weekly participation estimates within 4 percentage points of each other over the three year span of the studies. Taking the average of these two studies produced a reliable estimate of 24% weekly participation rate for 18 to 24-year olds.

Comparing and contrasting international studies with any degree of credibility is difficult. To provide the most reliable findings, only studies with very similar sample characteristics were deemed comparable. Random and stratified samples, student samples, and age ranges were matched as closely as possible in order to draw realistic conclusions between the international datasets.

Australian participation rates for adolescents (41%; Thomas et al., 2000) are 10 percentage points lower than figures reported in the UK (51%; Fisher, 2000) and almost 50% lower than those reported in Canada (80%; Gupta & Derevensky, 1998a). In youth samples, Australian figures (Maddern & Dickerson, 1999) show a lifetime rate of 75.7% of 16 to 24-year-olds having gambled, compared to 71% in Canada (Deverensky & Gupta, 2000). Total participation rates between the countries appear reasonably similar, however weekly rates vary considerably. Canadian figures report 56.6% (Derevensky & Gupta, 2000) gambled weekly compared to Australian figures of 13.3% (Maddern & Dickerson, 1999). The Australian youth figures are more similar to the 13% weekly participation rate reported by Ladouceur, et al. (1999a) in a sample with a mean age of slightly less than 15 years.

Comparing random, stratified samples with ages ranging from 18 upward, the two Australian studies (Dickerson et al., 1996; Dickerson et al., 1998) produced an
estimate of 78.8% past 12 months participation, 10 percentage points lower than a random stratified study undertaken by Ladouceur et al. (1999a) reporting 87%. However the averaged Australian weekly participation rate for 18 to 24-year-olds is 24% compared to 18% for a sample with a mean age of just under 24 years (Winters et al., 2000). The latter estimate is the only one in which Australian rates were higher than international figures. This is possibly explained by the low estimate being derived from the third administration of a longitudinal survey, in which it is likely that the 43% attrition rate was skewed towards regular gamblers.

Whilst it is difficult to draw conclusions from such limited data, total participation rates for adolescents were 10 percentage points lower than those reported in other countries. This ratio held true for total participation rates of samples aged 18 and above. Weekly participation figures appear to be lower generally than other countries with one questionable exception reported by Winters et al. (2000).

Participation rates are useful in projecting population equivalence for the purpose of estimating community resources required for problem gambling. The Youth Gambling Study (Maddern & Dickerson, 1999) is the most recent and largest sample base focusing on 16 to 24-year-olds. In this study respondents playing two to three times per month were combined with weekly or more frequent respondents and deemed regular players, providing a base analysis group of 226 regular gamblers from a total of 1008 respondents. Regular gamblers accounted for 22.4% of the total sample – a random, stratified sample which applied target weights for the demographic categories of age, sex and area, based on the most recent updated census figures available (ABS; October, 1999). From these representative and recent estimates, Table 2 (page 17) provides the conservative population equivalent figures showing that 792,563 Australian youth are estimated to gamble regularly.
Table 2: Population Estimates of Australian Youth Gambling

<table>
<thead>
<tr>
<th>Frequency</th>
<th>N</th>
<th>%</th>
<th>Population Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular (1/month+)</td>
<td>226</td>
<td>22.4</td>
<td>177,534</td>
</tr>
<tr>
<td>Infrequent</td>
<td>349</td>
<td>34.6</td>
<td>274,227</td>
</tr>
<tr>
<td>Occasional</td>
<td>180</td>
<td>17.9</td>
<td>141,868</td>
</tr>
<tr>
<td>Nonplayer</td>
<td>245</td>
<td>24.3</td>
<td>192,593</td>
</tr>
<tr>
<td>No response</td>
<td>8</td>
<td>0.8</td>
<td>6,341</td>
</tr>
<tr>
<td></td>
<td>1008</td>
<td>100</td>
<td>792,563</td>
</tr>
</tbody>
</table>

Measurement of Harm

The Australian approach to many challenging behaviours such as alcohol and illicit drug use has been a public health one, focused on a concern for harm reduction (Dickerson et al. 1997a). There are consequences attached to all choices in life, and particularly so when the choice involves an activity that has well known and documented associations with harm. Along with drug and alcohol use, some people experience a point at which the substance or activity begins to affect how they live, in direct and subtle ways. To date the gambling literature on the harmful impacts of gambling has essentially arisen from one of two approaches: The mental disorder conceptualisation (DSM-III; APA, 1980) and derived measures, or from Australian problem gambling studies in which problem gambling has been defined as:

"... the situation in which a person’s gambling activity gives rise to harm to the individual player, and/or to his or her family and may extend into the community." (Dickerson et al. 1997a).

The Australian problem gambling dimensions of harm, as outlined by the Productivity Commission Report (1999) are used as a basis for organizing harms. These dimensions are Personal Harms, Harm to Family and Friends, Work Related Harms, Financial Harms and Illegal acts. Appendix 1 lists corresponding items from the

**Measurement principles**

The development of the SOGS (Lesieur & Blume, 1987), contains important lessons for current day youth gambling researchers. Although not the first screen in use (it was preceded by the 20 questions of Gamblers Anonymous) the SOGS was the first measurement instrument demonstrated to have sound psychometric properties in a nonclinical population. The impetus for designing the scale came from the inclusion of Pathological gambling within the category of disorders of impulse control in 1980 (APA), and it has been used extensively since 1984.

The SOGS originated as a 20 item questionnaire based on DSM-III (APA, 1980) criteria for pathological gambling. It was measured in a ‘previous 12 months’ time frame with a yes/no item response format. The design was intended originally to provide a reliable, quantifiable and structured instrument, easily administered by professional and nonprofessional interviewers. The core construct of the DSM-III criteria from which the SOGS evolved, was the signs and symptoms that occur in the latter stages of gambling problems. At the time, it was criticized for being restrictive in its diagnostic potential and for containing social class bias (Lesieur & Blume, 1987).

The validation process occurred in three stages. Initial validation occurred on 1,616 participants, comprising 867 patients with diagnoses of substance abuse and pathological gambling, 213 members of Gamblers Anonymous, 384 university students, and 152 hospital employees. During the first phase, inpatients diagnosed with alcohol or drug abuse were screened for their gambling history and spouses and significant others who visited them were asked about the patient’s gambling habits.

The first three questions on the SOGS relating to form, frequency and parents’ gambling patterns were screener items. Answers to these questions determined whether patients proceeded to the second phase, i.e. clinical interview. Proceeding
to interview was based on “gambling once per week or more, having a parent who gambled frequently, or betting more than $10 on an event” (Lesieur & Blume, 1987).

Clinical interviews with gamblers and their significant others were then compared for consistency, and counselors, through individual and group processes, made independent assessments using a 5-point scale. The counsellor’s rating of 1 was applied when either parent had a history of pathological gambling or the patient gambled heavily whilst in the early or middle stages of alcohol or drug dependence (but was not a pathological gambler). At the other end of the scale a score of 5 was used when the patient had gambled extensively throughout his or her life and was definitely a pathological gambler. A rating of 3 was for participants considered borderline and a score of 4 or 5 was used to discriminate a smaller group of people with problems. From the constant comparison between self-reports, significant others and counselor assessments, the 20 items of the SOGS were selected.

Stage three provided cross validation of the 20 items by administering the questionnaire to 213 members of Gamblers Anonymous, 384 university students, and 152 hospital employees. Validation checks identified correlations between patients’ self-assessment scores and counselors’ independent assessment scores \((r = .86, df = 295, p<.01)\) as well as correlating family members’ assessments with patients’ self-report scores on SOGS \((r = .60, df = 125, p<.01)\). As a further check on the validity of the data, scores on the DSM-III-R (APA, 1987) were cross-checked with the SOGS. Using a score of four or more items on the DSM-III-R (APA, 1987) as an indication of probable pathological gambling, false negative and false positive error rates for the SOGS totaled 1.9% of the Gamblers Anonymous sample, 4.7% of the student sample and 0.7% of the employee sample.

With an empirically determined cut-point of 5 as the determiner, the SOGS correctly classified 98% of 213 members of Gamblers Anonymous as pathological gamblers (2% false negatives). Amongst the university cohort, 5% were classified as probable pathological gamblers. The authors cautiously stated that these university students were likely to represent false positive cases. Further, validation of the new SOGS measure occurred in Gamblers Anonymous populations, and these were reported by
Lesieur and Blume (1987). The SOGS and DSM-III-R were highly correlated at 
\( r = .94, \text{ df} = 747, p<.001 \).

The reliability of the instrument was investigated via 749 surveys yielding an internal 
consistency (Cronbach’s alpha) of .9 \((p<.001)\). Further, 74 inpatients and 38 
outpatients filled out the questionnaire twice, at monthly intervals during group 
sessions. The test-retest correlation (using a dichotomous classification of 
pathological or non pathological for inpatients and outpatients) was \( r = .71 \) \((\text{df}=110, 
p<.001)\), and was reported as a perfect correlation for outpatients with a lower 
correlation for inpatients \((r = .61; \text{Lesieur \\& Blume, 1987})\).

The SOGS was used in an epidemiological survey, reported in Lesieur and Blume 
(1987) in which it recorded a 1.4% prevalence rate for the adult population of New 
York. Despite the extensive validation of the scale and adequate re-test reliability, 
the authors stated “…the true sensitivity and specificity of the SOGS within the 
general population remains unknown” (Lesieur \\& Blume, 1987, p.1186). The SOGS 
gave on to become the most commonly used gambling screen, providing 
governments around the world with prevalence estimates of pathological gambling in 
the general population.

**DSM measures**

The DSM has had three iterations, beginning with DSM-III, its revision DSM-IIIR and 
the current edition, DSM-IV-TR (2000). Substantial moderations were made between 
the DSM-III and DSM-III-R. In the latter, maladaptive gambling behaviour is 
indicated by at least four of the criterion listed in Appendix 1. DSM-III was validated 
on a single study comparing the responses of GA members to a small treatment 
group with two ‘normal’ convenience samples including university students and 
hospital employees (Bergler, cited in Dickerson, 1989).

The more recent version (DSM-IV) has been detailed in the DSM-IV Sourcebook 
(Widiger, et al., 1998) which documents the rationale and empirical support for the 
text and criteria sets presented in DSM-IV. The Sourcebook contains summaries of 
the rationale for the final decisions on DSM-IV classifications, as well as results of the
data reanalyses and DSM-IV field trials. This sourcebook also provides the rationale for any significant changes made to the DSM-IV.

The SOGS and DSM-IV survey items appear in Appendix 2. In the case of DSM-IV, persistent and maladaptive gambling behaviour is indicated by five (or more) of the criteria, provided that behaviour is not better accounted for by a manic episode. As noted, scoring less than 5 is not indicative of a problem free gambler. Lower scores combined with losing more than $100 in a single day constitutes risk, and scoring 3 or 4 in combination with a $100 per day loss constitutes problem gambling (Productivity Commission, 1999).

The methodologies derived from the various DSM criteria assume it is essential to identify separate groups of varying mental disorder. Current research continues to reflect this, despite the acknowledged variations in gambling behaviours, and the subjectivity involved in the judgment of excess (and who is making the assessment; Dickerson & Adcock, 1987). Dickerson and Baron (2000) have questioned the construct validity in the DSM-IV and its propensity toward over inclusiveness when distinguishing disorder from nondisorder (Wakefield, 1992; cited in Dickerson and Baron, 2000). Both the DSM-IV and the SOGS have been adapted for use with youth, and remain the two main contenders for the 'gold standard' measure that Lesieur (1994) first identified as crucial to international comparisons.

In formulating the Massachusetts Gambling Screen (MAGS), Shaffer, LaBrie, Scanlan, and Cummins (1994) used the DSM-IV Subscale of psychiatric items to check the criterion related validity, i.e. the meaningfulness of the more socially oriented MAGS Subscale. The author stated that criterion-related validity furnishes evidence of a new instrument’s capacity to measure the phenomena under investigation, and does so by comparing the new scale’s data with the results generated from an instrument with widely endorsed criteria. Data from both instruments must be obtained from an identical sample of respondents so that the two indices provide separate but comparable measures of the same underlying characteristic (e.g., pathological gambling; Shaffer et al., 1994, p. 344).

The meticulous contrasting of the MAGS with the DSM-IV criteria lead to the seven MAGS items that discriminated pathology from nonpathology being subsumed by the
DSM-IV with the exception of an item relating to trouble at work or school. The correlation between the MAGS and the DSM-IV Scales (extended DSM-III to include 12 items instead of 10) was .73 and the authors (Shaffer et al., 1994) noted that instruments all measure different facets of gambling, with the MAGS emphasising the social aspects as opposed to pathology. It was also reported by Shaffer et al., (1994) that the DSM-IV identified 6.4% as pathological and the seven MAGS items identified 8.5% as pathological. MAGS pathology was measured in a yes/no response format over the previous 12 months, with a score equal to or greater than 5 indicating pathology.

The ‘testing’ sample was 698 students from three high schools in Boston. It was not a random sample and analysis occurred on just 698 of the 856 respondents. The sex distribution was 49% male and 51% female, with a mean age of 15.6 years (range 13 to 20 years). The author suggested it was possible that some of the MAGS items which failed to discriminate adolescent pathological from nonpathological gamblers would correctly classify adult gamblers (Shaffer, et al., 1994). This statement addresses the crux of the issue in youth gambling research – have we got criterion-related validity for the cohort? This issue is overshadowed, however by the absence of independent measures of pathology to validate the instrument.

During the past four years, there has been a welcome flurry of activity in youth gambling research emanating from Canada, the US and UK. DSM criteria were being applied some years earlier. In 1990 Griffiths undertook a study of 50 adolescent fruit machine players (mean age 16.2 years) using DSM-III-R criteria. By 1992 the DSM-IV criteria was under review and Fisher (1992) undertook a study of 460 secondary school students aged 11 to 26 years, applying the proposed DSM-IV-J (Fisher, 1992). The author argued the validity of the proposed DSM-IV-J (Fisher, 1992) based on the findings that participants defined as probable pathological gamblers were more likely to exhibit behaviours associated with dependency, than were the control group comprising social gamblers (accounting for 90% of the sample).
By 1993 the consultative period of the proposed DSM-IV had reached its conclusion and the DSM-IV was adopted by the American Psychiatric Association as the official screening instrument for pathological gambling. The endorsement of the DSM-IV-J (Fisher, 1992) rested on its close resemblance to DSM-IV – an instrument specifically calibrated for use in clinical interviews. The use of DSM-IV criterion in questionnaire format required identified cases to be labelled ‘probable pathological gambler’ (Volberg, 1996), as the criterion-related evidence for the items could not be verified without clinical assessment.

The prevalence rates generated by studies using different versions of DSM and SOGS are provided in Appendix 3 and recall that the criterion/item comparison of the etiology of the screens can be found in Appendix 1.

As has been well documented (Dickerson, 1989; Shaffer, Hall, & Vander Bilt, 1997; Winters & Anderson, 2000) the estimation of a population prevalence rate is dependent on a number of factors, and as Shaffer et al. (1997) point out, the truth of the estimate lies within the paradigm adopted by the researcher. Even in the best of scientific endeavours, the scientist manufactures the estimate in accordance with strategies, principles and methods that they choose. To list a few, psychometric instruments suffer from methodological limitations particularly due to sampling discrepancies, for example, true random sampling and representativeness, response rate/attrition, variation to time and date of data collection, sample size, age and geographic location. Further, different population segments, i.e. school samples versus youth in detention and in chemical dependency programs vary considerably from the normal population (Stinchfield, 2000). The key concern was the efficiency of cut-off scores changes as the base rate of the disorder changes in the population sampled. The shift in using the SOGS, from the base rates in the validation to a general population leads to a reduction in false negatives but a large rise in false positives (Dickerson, 1993). Other aspects, such as social setting and accessibility of gambling venues also fuel greater opportunity for divergent findings (Derevensky & Gupta, 2000). These concerns are now being widely explored in the literature, for example Winters and Anderson (2000) has noted that the criteria and definitions within the chosen classification system are fundamental to how we conceptualise behavioural disorders.
Added to sampling issues is the expedient but divergent prevalence comparisons derived from screens whose fundamental criteria and definitions vary. Youth estimates (Appendix 3) range from 1% (Volberg & Moore, 1999) to 11% (Rupcich et al., cited in Jacobs, 2000), a result that provides little reassurance to policy makers estimating resource needs. Youth estimates have been reported to be 4-8 times higher than adult prevalence rates (Lesieur & Rosenthal, 1991), with probable pathological/problem gambler estimates ranging from 3% to 9% - median of 6% (Winters & Anderson, 2000). Stinchfield (2000) suggests that based on the NRC report (1999), between 52%-89% of Youth in the US have gambled in the past year and combined pathological and problem gambling could affect as many as 20% of the youthful population.

The difficulties in comparing these estimates has been well documented. Comparative analysis is problematic due to the use of differing measurement instruments, the classification systems used, and not least the huge variations in sample characteristics and collection. For a review of issues relating to comparison see Shaffer et al. (1997). Notwithstanding these methodological issues, some researchers have asserted that the higher prevalence rates found in adolescent studies are unrealistic (Winters & Anderson, 2000). Of pressing concern to researchers attempting to establish accurate prevalence rates is the claim that higher estimates in youth samples occur because the cut-points used to assign pathology (3 or 4 problems) are lower than those used in adult samples (5 problems; Winters et al., 2002).

The cut-points in use on DSM-IV (APA, 1980) were specified by the Central Committee of the DSM rather than the specialist gambling subcommittee. The former preferred a diagnosis of Pathological gambling when an individual answered yes to five or more of the DSM items rather than 4, the cut-off preferred by the specialist group., provided there was no evidence of concurrent manic episode. The same standard, determined empirically, was adopted for SOGS.

The DSM cut-points were not validated externally. The variation in cut-points adopted between studies is problematic due to the trade off in false negative and
false positive error rates that occurs. As yet there is no established criterion, and no statistical basis, for assigning what number of problems constitute probable pathological gambling. These cut-points have, however, been used extensively by most US, Canadian and UK researchers, and have been repeatedly challenged by Australian research (Dickerson, 1989; Dickerson et al., 1997b; Dickerson & Baron 2000).

The technical problems associated with variations in prevalence estimates pale in comparison to the more fundamental problem facing researchers. Within the youth literature there were no studies identified which addressed the validation issue of youth screening instruments, let alone approached the thorough validation work undertaken on the Victorian Gambling Screen (discussed below; Ben-Tovim, Esterman, Tolchard & Battersby, 2001) or even the SOGS (Lesieur & Blume, 1987). In the case of DSM-IV-J (Fisher, 1992) and related measures researchers are applying a semantically adapted form of a clinical assessment tool which has accepted the adult criterion as valid within a youth population. In the case of SOGS-RA, researchers are similarly relying on validation from studies of the adult population. However as Dickerson and Baron (2000, p.796) noted, statements made by the National Research Council Report (1999) to the effect that “DSM-IV criteria (i.e. pathological gambling) appear to have worked well for clinicians for the past five years” are made in the absence of any supporting evidence. Although many studies have been carried out to confirm the practicality of these measures, thorough psychometric validation is absent and would ensure the correct criterion related link between the screen and the population is present. Without criterion-related validity, it is not possible to say whether we are measuring what we purport to, or whether we are measuring it well. Within the current classification systems proposed, there is very little validity data as yet (Winters & Anderson, 2000).

Evidence of validity for either the SOGS-RA or the DSM-IV-J (Fisher, 1992) or DSM-IV-J-MR; Fisher, 2000) is of a preliminary nature. The instruments demonstrate consistency in discriminant validity when comparing frequent and infrequent gamblers (Winters & Anderson, 2000), and the SOGS-RA has recently discriminated different proportions of daily male and female gamblers (Poulin, 2002). There is no doubt that the screens do perform in accordance with expectations, as they have
done in adult populations. However, it has been demonstrated that adolescents require an explanation of the items in the SOGS-RA. When completing the screen a second time after having the items explained to them, the group of adolescents scoring 3 or more was reduced by 47% (Ladouceur et al., 2000).

The National Research Council (1999) has stated that the appropriateness of taking definitions of problem gambling from adult studies and applying them to youth remains questionable. Developmental adjustment is required (Martin & Winters, 1998), and not just the adaptation of wording, but at a conceptual level where consideration is given to what really does create problems within the specific age group. The harbinger of this need is the more established field of drug research where researchers have inferred validity from adult-related criterion, and concerns have surfaced that adult-related criterion may be a poor model when applied to youth (Winters & Anderson, 2000).

One aspect of the problem associated with the screens currently in use is whether or not an ideal screen would identify prevalence rates of problematic gambling in the general population as well as provide clinical utility (Derevensky & Gupta, 2000). Derevensky and Gupta (2000) suggest an effective screen would include behavioural items describing the frequency and severity of gambling problems, as the SOGS does, as well as the associated psychological, social and financial consequences. In particular they note that such a measure should be age appropriate.

**Harm: Australian problem gambling**

Studies from Canada, the US and Australia have noted that today’s youth live in a culture in which gambling has always been a legal activity. Indeed, within the Australian community gambling is viewed as a normative recreational activity amongst the general population (Dickerson & Baron, 2000) and also amongst youth (Moore & Ohtsuka, 2000).

The preferred alternative to the mental disorders conceptualisation is the Australian problem gambling approach, in which:
‘Problem gambling’ refers to the situation when a person’s gambling activity gives rise to harm to the individual player, and/or to his or her family, and may extend into the community (Dickerson et al., 1997a).

This definition is predicated on the fact that no gambling behaviour is necessarily harmful or harmfree: the impacts arise from the context in which the gambling occurs. Thus, in one context a single lottery purchase may result in significant interpersonal distress and arguments and in another the loss of millions of dollars in casino gaming may have no negative impacts (Dickerson et al., 1997a).

This definition was central to the Productivity Commission’s Report (1999) on the harmful impacts of gambling. In 1998, as a result of the rapid expansion of gambling, particularly in Victoria, The Australian Treasurer, The Hon. Peter Costello referred Australia’s gambling industries for inquiry because there was a need to better understand the performance of the gambling industries and their economic and social impacts across Australia. The work was undertaken by the Productivity Commission in the 12 months to July 1999. The Productivity Commission is an independent Commonwealth agency which conducts public inquiries and research into a broad range of economic and social issues affecting the welfare of Australians. The Commission’s independence was underpinned by an Act of Parliament and its processes were open to public scrutiny and invited public and business participation in the process through a series of open forums and submissions.

The inquiry set out to determine eight objectives, including the nature and definition of gambling, the participation profile of gambling, the economic and social impacts of gambling and a range of issues dealing with regulatory structures for gambling. The earlier definition of problem gambling in which Harms to self and others and extending into the community (Dickerson et al., 1997a; Ferris, Wynne & Single, 1999), was extended to include a lack of control by the gambler over their gambling behaviour and/or adverse personal, economic and social impacts which result from a gambler’s actions – particularly the financial losses sustained (relative to the gamblers financial means). It was stated that the primary source of problems for most problem gamblers is the financial loss which occurs, and which subsequently has a range of social and personal repercussions.
Six categories of Harms were identified. Many were not confined to problem gamblers themselves, but involved the imposition of costs on family members, employers and other community members. Evidence suggested that 5-10 other people could be affected by the behaviour of a problem gambler, thus placing demands on the resources of community and public services.

**Among the Harms reported:**

- One-tenth of those with significant gambling problems – and 60% of those in counselling – admitted seriously contemplating suicide as a result of their gambling;
- Nearly one-half of those gamblers in counselling reported losing time from work or study due to gambling (overall decline in work performance of around 7%);
- Gambling losses averaged 20% of household income for problem gamblers (compared to 3% for the general population) and
- One in five problem gamblers admitted borrowing money without paying it back, with one in two going into debt to finance their gambling.

The commission’s national survey data suggests that between 27% and 37% of aggregate gambling losses are accounted for by problem gamblers – representing between $2.9 and $3.8 billion a year. Based on survey data, gambling losses were said to represent an average of 19.1% of gross household income for problem gamblers (with a median of 9.9%). The inevitable consequence of a high ratio of gambling spending to income is that problem gamblers tend to erode their assets or borrow. One in five problem gamblers borrowed money without paying it back and one in two have borrowed money to finance their gambling.

The Productivity Commission’s (1999) conceptualisation of Harms (as above) are logical extensions of existing criteria, moving out from the individual and tending to show lower rates of harm than DSM or SOGS measures. In undertaking a Youth Gambling Study (Maddern & Dickerson, 1999) the Productivity Commission’s (1999) analysis of combined data sets drawing on a large population of respondents
provided the best possible conceptual clustering of Harm items with which to commence work.

In the wake of the Victorian Casino and Gaming Authority’s (Dickerson et al., 1997a) official definition of problem gambling and the Productivity Commission Report (1999), a specifically harm focused approach to the measurement of gambling was designed. The Victorian Gambling Screen (VGS; Ben-Tovim et al., 2001) was developed to measure prevalence based on the assessment of harm that arises from gambling. During the validation process the VGS was administered in interview format (excluding self-reports) mostly in a variety of locations, including treatment centres and also as a computer aided telephone interview. The developmental phase did not include self-report measures. It is well suited to use in a population sample because it has been validated on gamblers from treatment and nontreatment populations (nongamblers removed).

The development of the VGS (Ben-Tovim et al., 2001) was strengthened by passing through multiple stages utilizing methodologies that differed in their fundamental approach to the research task. The initial development phase commenced with focus group sessions involving community members, regular gamblers and participants in a gambling treatment program. The demographic mix was varied and included rural as well as city dwellers. The focus groups presented scenarios to participants to elicit responses about gambling, particularly in relation to setting limits and enjoyment derived from gambling. From the focus group results a pre-pilot questionnaire was designed, mindful of the existing body of gambling literature, and the substantial clinical experience of two of the authors. Development of the pre-pilot survey questions occurred from scrutiny of focus group material, input from community consultations, extensive body of gambling literature and also included items developed by the research team where no other satisfactory information had been amassed (e.g. items relating to understanding the odds, the benefits derived from gambling, control markers especially in relation to limit setting and items measuring psychosocial dysfunction). The pre-pilot questionnaire (interview format) was administered to 138 individuals, 112 of whom were considered to be gamblers.
The questionnaire consisted of approximately 100 items and was presented to respondents in four different formats, door-to-door, CATI, Outside gambling venues and Clinical interview. Items comprising the VGS (Ben-Tovim et al., 2001) are in Appendix 4.

Results from the pre-pilot survey identified three factors, the first a Harm to Self factor which identified the consequences of gambling to the individual (accounting for 63% of the variance), a second factor entitled Harm to partner and a third factor related to the enjoyment of gambling. The second and third factors accounted for 18% of the variance together. To aid interpretation the factors were rotated (oblique direct oblimin rotation). Factors 1 and 3 were moderately correlated \( r = 0.515 \) and factor 2 had close to zero correlation with both factors 1 and 3. Decisions made to remove items were on the basis of repetition, poor wording, alternative questions having better discriminative capacity, or if their factor loading failed to achieve the cut-off. The outcome from the exploratory process was a set of 25 items that loaded highly on to the Harm to Self factor. These 25 items were then used to form the Pilot Version of the VGS.

The Harm to Self Scale was derived by summing items 4 through 10 and 11 through 15, 19 through 21 (see Appendix 5). If any of these questions is scored as don't know or not applicable or is blank, the item should be considered to be missing. If four or more of the 15 items making up the scale are missing then the scale should not be computed. The authors suggest that with up to three items missing, values may be imputed. Scoring is on a 7-point Likert-type scale, with 0 = never, 1 = rarely, 2 = sometimes 3 = often 4 = always 8 = can't say 9 = n/a. Possible range of scores is from 0 (no harm to self) to 60 (high harm to self).

The Piloting of the VGS was undertaken via interviews with 261 respondents obtained door-to-door (29.7%) at gambling venues (33.1%) at problem gambling clinics (9.2%) and other miscellaneous locations (28%). Data for twenty-two nongamblers was eliminated, leaving a total pilot sample of 239 on which to perform confirmatory factor analysis. The confirmatory factor analysis used structural equation modelling (path analysis) on AMOS (Amos Users’ Guide Version 3.6, SPSS
Inc., Chicago, 1997). The scale-free least-squares solution was used to allow for variations in item response format. After four items were removed to provide a ‘better’ fit to the data. The model achieved good fit statistics (RMR = 0.119, GFI = 0.978, an NFI = 0.974) providing an instrument that measures problem gambling using Harm to Self as the defining criteria.

The next stage involved validation interviews to check the criteria against expert knowledge. Using the DSM or SOGS as a gold standard was not seen as appropriate because of the vastly different assumptions upon which the instruments were based. Partly based on an assessment developed for out-patient behavioural treatment program for problem gamblers at Flinders University (South Australia), the validation standards were designed to ensure that lay interviewers could administer and ascertain answers to behaviour specific questions and probes, identifying the relevant aspects of gambling behaviour and possible harmful consequences. The questions were open-ended and the responses were tape-recorded. An assessment of gambling status was made on the content of the entire interview. The final assessment was made by an expert familiar with the dilemmas of problem gambling.

The questions asked related to the identification of problem gambling in relation to harm and the interviewers asked a further range of structured questions, the answers to which covered the criteria in the DSM model. In all, 71 validation interviews were conducted, assessed and assigned a global rating of nonproblem, borderline problem or problem gambling.

To minimise clinical bias, interviews were conducted by health professionals, either psychologists or nurse therapists, without specific experience with the treatment of problem gambling. Explicit criteria were developed to aid the distinction between problem and borderline problem and these criteria were explored until each assessor felt comfortable with the assessment process. All assessors then assigned the same six tapes to a gambling status. Resulting inter-rater reliability was stated to be \( r = 0.99 \) with 95% confidence interval (0.981 to 0.999). The remaining tapes were then randomly distributed to raters who assigned them a problem gambling status.
Raters were also asked to review the responses against the DSM IV criteria with at least five of the 10 DSM items indicating pathological gambling.

Pilot study data was collected from 93 people who completed a household study on leaving gambling venues or at treatment centres. Efforts were made to reach a broad demographic range and data was collected from a number of people outside the fieldwork component of the study. Respondents were also asked to complete the SOGS after the household survey containing the VGS, to enable comparisons to be made. Regression analyses confirmed that only the Harm to Self Scale was predictive of the three categories of gambling, nonproblem, borderline problem and problem gambler. The logistic regression result \( (p = 0.00) \) was achieved with a single scaled item (the Harm to Self Scale), with almost no change when Harm to Others and Enjoyment of Gambling Scales were included. Notably Enjoyment of Gambling Scale \( (p = 0.35) \) and Harm to Partner Scale \( (p = 0.57) \) were not close to reaching significance.

These findings suggest that problem gamblers report enjoying gambling, despite the literature contention that losing the enjoyment of gambling is one of the indicators of problems (Maddern & Dickerson, 1999). Further it suggests that problem gamblers are still enjoying gambling even when causing harm to others. Consequently, basing the assessment of problem gambler on Harm to Self alone does not adequately measure the definition of harm, as defined as part of the study’s objective.

The VGS comprised three factors and each of these was assessed statistically prior to determining cut-points. The Harm to Self Scale was the only valid predictor of gambling status. Consideration of the ROC (Receiver Operating Characteristic) analysis used to determine optimal cut-points for the Harm to Self Scale are discussed below and can be viewed in the Victorian Gambling Screen Interim Manual (p. 147).

The Achilles heel of psychometric instruments has been determining the point on a scale at which human characteristics are sufficiently different from preceding participants, to say scores above that level represent a statistically different behaviour or attitude. These cut-points draw a very fine line between correctly
attributing gambling status versus misclassification. Cut-points are often varied by researchers for numerous reasons, and in shifting the cut-point the accuracy of the instrument, its sensitivity and specificity is altered.

In the design of the VGS (Ben-Tovim et al., 2001) a psychometric technique has been used in which the specificity and sensitivity of the cut-point is weighted to ensure the lowest error rate classification possible i.e. minimal false negatives and false positives. Both the sensitivity of an instrument (in correctly determining true problem gamblers) and the specificity (in correctly identifying nonproblem gamblers as problem gamblers) can be balanced to provide a score on the instrument at which point sensitivity and specificity are at their maximum. The ROC (Receiver Operator Characteristics) analysis is a test which plots specificity against sensitivity – as a means of judging the value of the test. The probability of a false negative is defined as 1-sensitivity. If specificity is plotted against 1-sensitivity the point where they cross is the place on the curve where both sensitivity and specificity achieve their maximum. This is the ideal cut-point. Using the ROC analysis a score of 1 identifies a perfect match between specificity and sensitivity.

Using the ROC method the following cut-points were determined: A score of 21 or more on the Harm to Self Scale correctly classified 93% of respondents. Using a cut-point of 21 to identify problem gamblers, 3% of the sample were said to be likely to be identified as problem gamblers. A cut-point of 9 and above identified problem and borderline gamblers. Using a cut-point of 9 and above to identify problem and borderline gamblers a likely total prevalence of 7.5% of the population was given, implying that 4.5% would be borderline gamblers. A cut-point of 14 and above, which was the equivalent of scoring 5 on the DSM produced a likely prevalence of 5%.

The authors noted that the pilot sample on which these analyses were based was small (n=93) and the prevalence estimates suggested are therefore indicative only. However it is noteworthy that small variations in percentages can equate to tens of thousands of people. Given this fact, consider the most reliable estimates to date arising from the US data cited by Derevensky and Gupta (2000; Appendix 3) that between 9.9% and 14.2% of youth are at risk of developing gambling problems and between 4.4% and 7.4% already exhibit serious gambling related problems (i.e. 

33
pathological gambling behaviour). These rates are in contrast to the 3% problem and 7.5% borderline problem gamblers obtained by the VGS in a sample biased towards youth, using statistically validated cut-points.

The divergence in these figures provides an imperative to challenge the use and validity of measures derived from mental illness models in Australia. In Australia youth participation rates are lower than those of adults, especially for continuous forms which place players at risk, whilst mental disorders measures suggest higher rates of pathology. There is no doubt youth are attracted to gambling, especially as they approach and enter legal adult status. Participation rates increase as youth are able to legally enter gaming and betting venues. There is also no doubt that a range of harmful impacts do arise from their gambling, but exactly at what rate and what form they take is not clear from the literature – other than as a pale reflection of the findings from the adult population.

As yet the VGS has had little use in youth samples, however the methodological and statistical strength of the instrument coupled with a firm grounding in empirical data provides a good model to provide greater understanding of individual differences in the experience and antecedents (Dickerson, Cunningham, England, & Hinchy, 1991) of problem gambling.

Chapter 2 reviewed the marked variation in participation and prevalence rates for youth gambling. As was tabulated (Table 1, page 13), the variation in methodologies (e.g. screening instruments, age groupings and cut-points) made it difficult to provide an overall estimate of prevalence for youth gambling with even a moderate degree of reliability. The variations in prevalence rates have occurred because the measurement instruments used to collect data have not been sufficiently validated, and in particular, validation has not occurred on the target group (youth). Furthermore, the shifting and arbitrary cut-points assigned for pathology have not been established statistically. Consequently, the Australian Problem Gambling approach to measurement was reviewed, in particular the methodological and statistical strength of the VGS, and adopted as the preferred approach.
Chapter 3: Theoretical explanations of youth gambling

Chapter 3 discusses theories that have been applied to youth gambling and the causal explanations they provide. Studies which fit within the mental disorders conceptualisation i.e. having used DSM (APA, 1994) or related instruments as the defining criteria, are reviewed first and studies with an Australian problem gambling orientation are reviewed second.

DSM approach

Emotions/Arousal

An example of promising research is the model proposed by Gupta and Derevensky (1998b) based on Jacobs' (1986) General Theory of Addictions. Gupta and Derevensky (1998b) fitted a structural equation model to test the theory proposed to explain why gambling becomes an addictive-like activity. Jacob’s (1986) General Theory of Addictions assumes the main cause to be an abnormally high arousal resting state. The theory advocates psycho-physiological research on the assumption that abnormally high or low arousal levels drive people to gamble as a means of satisfying a homeostatic drive to a subjectively acceptable resting state. Specifically, gamblers are attracted to gambling because it has a sedative like effect, reducing a hyper arousal level. The reduction in arousal level that occurs during the dissociated state is a form of self-medication and positively reinforces the gambling behaviour.

Jacobs' (1986) General Theory of Addictions, as it has been operationalised by Gupta and Derevensky (1998b) presented an important empirical test of the causes of Pathological gambling. It has good face validity in that treatment programmes have been based upon clinical and empirical findings that gambling problems develop because of the need to escape other underlying problems (e.g. anxiety disorders, poor coping skills, relational and familial problems, low self-esteem etc.
(Gupta & Derevensky, 1998b) and that a dependency on gambling is formed in this process of escaping.

Although essentially a correlational technique, SEM enables researchers to posit a model and describe and test the causal variables in a theory. If the model fits the data well, it validates the theory being tested, and assumes that the direction of the effect proposed in the model holds true, at least in that dataset. A requirement of this method, if it is to be other than exploratory, is that scales utilised in the model be well substantiated in the literature and well validated statistically, as was the case for most variables in this study.

Eight hundred and seventeen students aged 12 to 17 were assigned to one of four classifications according to frequency and severity of gambling, Groups 1 and 2 being non-gamblers and occasional gamblers respectively, Group 3 comprising regular gamblers (once/week+) with a minimum of two reported DSM-IV-J (Fisher, 1992) problems; and Group 4 defined as problem and pathological gamblers reporting a minimum of three DSM-IV-J (Fisher, 1992) problems. In this instance the DSM-IV-J (Fisher, 1992) criterion of four or more problems was lowered with the intention that the lower score would capture at-risk gamblers and those recovering from gambling problems. The final model is shown below, in which a number of instruments were used to test a wide range of constructs. The SEM model tested was:

<table>
<thead>
<tr>
<th>SEM Model</th>
<th>Comprised of</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiological disposition</td>
<td>Excitability (HSPQ) Arousal</td>
</tr>
<tr>
<td>Emotional predisposition</td>
<td>Self-concept (Harter) RADS</td>
</tr>
<tr>
<td>Need to escape</td>
<td>Dissociation (Jacobs, 1988)</td>
</tr>
<tr>
<td>Comorbidity</td>
<td>Drug use items</td>
</tr>
<tr>
<td>Gambling Severity</td>
<td>DSM-IV-J (Fisher, 1992)</td>
</tr>
</tbody>
</table>
Detailed information about the constructs is available at Appendix 6. For the purposes of this study only the significant predictors are detailed below.

After validating the General Theory of Addictions model, the significant findings were that Group 4 (pathological gamblers) differed significantly from other groups. They had the highest levels of excitability and disinhibition, greater depression and apprehension, and scored higher on their experience of dissociative states than any other group. Further, substance use was positively correlated with the degree of gambling participation. The self-reported physiological factors arousal and emotional predisposition were found to predict Dissociative behaviours, i.e. blackouts, trances, out of body type experiences or feeling like a different person. This latent dissociation variable in turn directly predicted problem/pathological gambling as did emotional predisposition to a lesser extent.

One questionable aspect of reliability, acknowledged by the authors, is that physiological arousal levels were inferred via behavioural measures. More commonly physiological variables are based on heart rate (Blaszczyński, Winter, & McConaghy, 1986) or blood pressure (Carroll & Huxley, 1994). Using a behavioural measure is particularly problematic when that behavioural measure, i.e. dissociation, was foremost of the latent variables predicting Pathological gambling. However the model suffers from several more critical limitations. Firstly, at a broad conceptual level the cross loading of the latent emotional predisposition factor onto excitability is worrisome, and the fact that it loads more highly onto the opposite factor encapsulates that concern. The most substantive concern, however, lies with the structure of the model. With only two factors underlying each latent variable the model is saturated, i.e. has zero degrees of freedom and will therefore always fit perfectly. Under these circumstances the model cannot be disproved and becomes heuristic as opposed to causal.

As it has been operationalised Jacobs’ (1986) General Theory of Addictions requires refinement before further validation studies could be conducted. Methodological concerns notwithstanding the theory provides a promising argument for the role of dissociation in Pathological gambling. The results from the model raise further
questions that challenge the theory. For example, out of body type experiences or feeling like a different person are states associated with the escapist or trance-like nature of gambling, which may arguably also occur with highly practiced, repetitive behaviours.

In this section, researchers argued that the mechanism by which dissociation operates is the relief it provides through escaping life problems. The relief is so great that youth may become dependent on gambling as their main source of comfort. When gambling becomes a regular way of obtaining this comfort, and the comfort is necessary to support day to day life, the extent of the dependency is very likely to be associated with signs of Pathological gambling. In Jacobs' (1986) General Theory of Addictions, dissociation is the single explanatory factor in Pathological gambling. Other theoretical models take a process approach to explaining gambling behaviour, allowing for the interplay of life skills with the problem.

**Developmental themes**

The Stages of Change model (DiClemente, Story, & Murray, 2000) provides a cognitive/behavioural model of the initiation and cessation of gambling in a developmental context. It presents a non-empirical explanation of the progression from onset of gambling through to Pathology via the five stages, precontemplation, contemplation, preparation, action and maintenance. DiClemente et al., (2000) proposed that all individuals are not equally vulnerable to Pathology, but when it occurs there are areas of an individual's life that influence their ability to cope. Developmental domains such as cognitive, interpersonal, and family, for example, act as facilitating or restraining factors in the individual's attempts to make change.

The basis for proclaiming regular adolescent gamblers as being at high-risk is the assumption that adults, having taken up gambling later in life, have not only an income to accommodate gambling losses, but have developed other sources of satisfaction and self-esteem. The acquisition of these attributes along with assumed money management skills equate to a greater likelihood of developing self-regulated, non-harmful, gambling patterns. Essentially the argument rests on the assumption that the further along the lifespan one progresses, the greater the accumulation of
skills that will support self-regulation. Consequently, adolescents may progress to pathological gambling more readily than adults because self-regulation is likely to be more difficult for them to achieve (DiClemente et al., 2000).

In the preparation stage, where commitment and planning to change a behaviour occurs, DiClemente et al. (2000, p. 307) proposed that “coping skill assessment and development are critical” to ensure that the adolescent has all the necessary psychological skills to implement the action plan. When preparing to act on abstinence from gambling, it is clear that psychological and social skills will be either an asset or a hindrance, depending on their level of development. To this end “developmental considerations for interventions with adolescents are of paramount importance” (DiClemente et al., 2000, p. 209).

As well as psychosocial skills mediating gambling problems, the amount of time elapsed between the onset of the addictive behaviour and the events that may have triggered it could be crucial. For adults the elapsed time is usually so great that the original cause of onset may have diminished or changed. “However, for the adolescent compulsive gambler, the short time span between initiation and current behaviour preserves the importance of the associated problems that also played a role in initiation” (DiClemente et. al., 2000, p. 304). One of the many reasons researchers find the adolescent target group a rewarding research population is because behaviours are not as firmly entrenched and the opportunity therefore exists to change and prevent harmful events, especially those that may have significant long term implications for health and well-being.

Given opportunities for prevention, nonetheless when youth arrive at the maintenance stage (DiClemente, et al., 2000) of an addictive gambling pattern, their behaviour becomes more resistant to change. The addictive behaviour is integrated into the lifestyle of the individual and becomes a significant source of reinforcement for that individual. At this point, one’s relationship to gambling changes in that they are no longer engaging in an external behaviour, but have come to define themselves by the behaviour (DiClemente, et al., 2000). This shift in identity to describing oneself as a gambler has been noted (Gupta & Derevensky 1998b; Moore & Ohtsuka, 2000) whereby the adolescent has assumed the identity of gambler and
the associated status trappings (Maddern & Dickerson, 1999). The gambling identity has been discussed in relation to rites of passage (Hardoon & Derevensky, 2002) and risk-taking. In the latter case social sanctions may reinforce the behaviour because they are indicative of a sought-after nonconformity (Moore & Ohtsuka, 2000).

**Delinquency**

Non-conformity is frequently acted out in risky-behaviours and delinquent acts. The latter is a focal research topic in the United Kingdom where youth are accustomed to more liberal access to gaming machines (fruit) (Fisher, 1999). In the UK, associations have been made between delinquency and the amount of unstructured and unsupervised leisure time available (Fisher, 1992). The line of reasoning was that dependency on video games may lead to gaming machine (fruit) play and potential dependency on gaming machines (fruit), resulting in youth committing delinquent acts to fund gambling (Griffiths, 1991). This association rested on demonstrating initially that video game players and gamblers were one and the same group. On face value this assumption was reasonable given that both video games and gaming machines (fruit) are located together at amusement arcades (Fisher, 1995). Indeed, Wood and Griffiths (1998) emphasised the similarity between the two activities and that the demographic breakdown of video game players appeared similar to gaming machine (fruit) players. The skill component evident in video games was likened to the ‘skill’ involved in staying on a gaming machine (fruit) as long as possible. This connection is dubious however, given the different characteristics of each. For example, when there is no stake involved (Anderson & Brown, 1984; Dickerson, 1989) games results do not generalise to real gambling.

Problems have beset testing the gambling-delinquency link since the early 1990s. In Fisher’s (1992) study the methodology used to test the relationship between delinquency and gaming machine (fruit) play was confounded (Abbott, Palmisano, & Dickerson, 1995). Some items used in the classification of both Pathological gambling (DSM-IV; APA, 1980) and delinquency were almost identical, e.g. stealing money occurred in both. Because the gamblers and delinquents were assigned their status by overlapping criteria it was impossible to support the links between them.
In a partial replication of Fisher’s (1992) study, Abbott et al. (1995) supported the relationship between frequency of play of video games and delinquency. However the relationship explained only 18 per cent of variance in total delinquency scores, suggesting that if video game players were also gamblers, the association between gambling and delinquency was relatively minor. Abbott et al. (1995) suggested that other factors such as harsh and inconsistent discipline and poor monitoring of the child’s activities characterise the families of delinquent adolescents and are long term predictors of delinquency. They also pointed to the difficulty of attributing causality from concurrent behaviours. The video game player may indeed also be a machine gambler, however access to the combined products of video games and gaming machines (fruit) comes as a package and the direction of causality between the two still requires further testing, as does the link between delinquency and gambling (Ladouceur et al., 1999a).

More recent testing of the gambling-delinquency relationship has clearly and explicitly stated the measures used (Stinchfield, 2000). In a robust sample of school children (n=78,582), Antisocial Personality Disorder (American Psychiatric Association, 1994) was the highest ranking regression predictor of delinquency for boys and third highest for girls. In this study delinquency was determined by a 12 month prior history of theft, property damage or physical violence. Delinquency and related psychosocial maladaptive indicators (i.e. parental problems) were also strong predictors of problem gambling in the underaged sample.

In a study of high school students aged 12-18 (n=3,426; Ladouceur et al., 1999b) the measurement of delinquency was again explicit, but differed from other studies (Fisher, 1992; Fisher, 1995; Winters et al., 2002). Significant differences between non-problem gamblers and probable pathological gamblers occurred on academic criteria such as being evicted from class, failing a course, lower academic achievement, less time spent on homework, and missed classes. Based on evidence from (Arseneault, Vitaro, Brendgen, & Tremblay, 1997) in which gambling led to delinquent behaviour in adolescents, Ladouceur et al. (1999b) claimed that the link between gambling and delinquent behaviour did not originate in common dispositional factors such as childhood impulse control deficit. Rather, they argued that gambling requires much time and energy and therefore the majority of problem
gamblers experience academic or family difficulties. This study asserted the reverse casual direction, in that gambling leads to delinquent behaviours.

As both independent and dependent variable, the structure of delinquency has varied from study to study, presenting a broad cluster of delinquency measures. In adolescent samples, substance use is also commonly grouped with delinquent behaviours because contravening the age restrictions on smoking and drinking has legal implications, as does illicit drug use. Ladouceur et al. (1999b) analysed separately the effects of alcohol, cigarettes and drugs showing that probable pathological gamblers and at-risk gamblers consumed more of each than non-problem gamblers.

Focussing on the concurrency of drug/alcohol use, gamblers and delinquents, Vitaro, Brendgen, Ladouceur and Tremblay (2001), draw on, but do not expressly test, Jessar and Jessar’s (1977) and Donovan and Jessar’s (1985) construction of general problem behaviour, which included delinquency, tobacco, drug and alcohol use as well as risky sexual behaviour. To account for the links between measures of deviancy, using drugs/alcohol and gambling, there were three antecedent factors proposed; personal disposition, familial characteristics and social/peer factors. Delinquent behaviour over the past 12 months was measured by the self-reported Delinquency Questionnaire (LeBlanc & Frechette, cited in Vitaro et al., 2001) at ages 16 and 17 and included 17 items on physical violence, theft and vandalism. A SEM analysis was used to address the overarching question, is gambling part of a syndrome of problem behaviours.

The longitudinal design of this study offered a different perspective from previous studies which had only assessed concurrent behaviours relating to gambling, drug/alcohol use, and delinquency. Concurrent studies have adequately demonstrated that a number of adolescents who are involved in gambling activities are also involved in a variety of deviant or risk-taking behaviours such as drug use (Barnes, Welte, Hoffman & Dintcheff, 1999; Winters & Anderson, 2000) and delinquent acts (Fisher, 1995; Vitaro et al., 2001). These studies have not been able to determine whether the three problem behaviours influence each other during adolescence, above and beyond the immediate timeframe of the data collection.
Thus, the causal direction to the relationship has not been specified. Does delinquency lead to problem gambling or vice versa? A partial answer can be gleaned from an earlier study (Ladouceur et al., 1999a) in which it was hypothesised that the links between gambling, delinquency, and drug/alcohol use can be explained by common antecedent risk factors, that is they all develop in parallel from common roots.

Ladouceur et al.'s (1999a) study of 717 respondents aged between 13 and 17, supported the established links between adolescent gambling, delinquency and drug/alcohol use. The authors provided support for Jessor and Jessor's (1977) general deviance syndrome by strong concurrent links between the three problem behaviours by virtue of their common, underlying risk factors. They used the untested model (Jessor & Jessor, 1977) to argue that the different problems are different manifestations of the same underlying deviant orientation, which is predicted by personal, familial and social influences. Once these common risk factors were controlled for, the relationship between gambling, delinquency and drug/alcohol was reduced, but remained just significant. The reduced statistical strength suggested other causal pathways exist. Notably, no measure of gambling behaviour (frequency or problems) was predictive of delinquency or substance use at age 17. The authors argued that delinquency and substance use culminate at age 17 and this finding may reflect a ceiling effect. These findings support a growing body of research (e.g. Winters et al., 1998) in which the association between delinquent behaviours and young gamblers was shown to diminish with age.

The Ladouceur et al. (1999b) study, with a large and robust sample, supported earlier findings of links between gambling and delinquency, but was not able to substantiate a causal direction amongst the problem behaviours. This is due in good part to the variations in what constitutes delinquency, and also emphasises the heterogeneity of gamblers that has impeded research to date (Dickerson & Baron, 2000). Some delinquents gamble and some gamblers are delinquents, but the overlap between the groups is not substantial enough to provide a good explanation for the cause of problem gambling. As Vitaro et al. (2001) have suggested, adolescents who score high on gambling, delinquency or drug use should be distinguished from those scoring high on other problems, (e.g. problems with a
developmental basis) because the aetiology and the prognosis may differ. The paths to problem gambling are indeed varied and complex (Dickerson & Baron, 2000).

**Cognitive/Behavioural approaches**

Cognitive approaches explain problem gambling by reference to the quality of thinking the gambler engages in. Superstitious beliefs allow a person to think that they have some means of predicting winning lottery numbers (Rogers, 1998) for example, or that gaming machines can be influenced by a particular style of play (Griffiths, 1990). These irrational thoughts, erroneous cognitions and misperceptions influence behaviour, and over time, may generate erroneous skill-based attributions for wins. The Illusion of Control (Langer, 1975) has been utilised as an explanatory mechanism for numerous cognitive studies of youth gambling (e.g. Coventry & Norman, 1998; Derevensky, Gupta, & Cioppa 1996; Griffiths, 1990; Ladouceur & Dube, 1997), but has been directly tested less often. It was shown to motivate youth to elaborate strategies to win more money (Ladouceur, Sylvain, & Letarte, 1998), even though there is no effective strategy in most forms of gambling (Wagenaar, 1988). In fact people find it difficult to accept the probabilistic, chance nature of many events, preferring instead to believe that random events can be influenced. The most notable explanation of cognitive distortions present in the youth literature is the psychobiology of the *near miss*, (Griffiths, 1998) which relies on intermittent reinforcement principles to explain how persistence is increased by striving for and almost reaching the desired outcome.

The legacy of cognitive behavioural research is particularly valuable in youth treatment models appearing in the literature since the early 1990s (e.g. DiClemente et al., 2000; Gupta & Derevensky, 2000; Ladouceur, Boisvert & Dumont, 1994; Ladouceur et al., 1998; Pursley, 1991). These models assume that gamblers have generally learned and utilise ineffective cognitive structures that contribute to illogical/irrational decision making (Rugle, 1993). It should be noted that in the case of very young children, misconceptions about influencing outcomes of gaming machines may be due to inadequate cognitive development, whereby information about the nature of random events has not yet been learned (Derevensky et al.,
1996). Speculatively, delayed cognitive development may also be a contributing factor amongst older youth.

**Australian problem gambling literature**

In the following section Australian Problem Gambling Literature is reviewed and part-way through the Illusion of Control is revisited within that framework. The contributions of Australian authors Moore and Ohtsuka (1997; 1999a; 1999b; 2000) have provided a number of methodologically sound studies in which the emphasis has been on psychological theory rather than estimations of Pathology or prevalence, for example. In Moore and Ohtsuka’s (2000) more recent study, the SOGS (Lesieur & Blume, 1987) has been used as a continuous variable against which conceptualisations of self-control were assessed.

**Developmental themes**

Alleviating boredom is a commonly cited motivation to gamble (Gupta & Derevensky, 1998a) and has been associated with unstructured leisure time and delinquency (Fisher, 1995). Moore and Ohtsuka (2000) have made the link between the structure of leisure activities and gambling behaviour.

With a sample of 769 secondary students (mean age 16.3 years) drawn from five schools located in predominantly working class area, they administered a 41-item activity scale to assess the use of leisure time. Leisure time activities (excluding gambling) were categorised as structured or unstructured. Twenty-three of the activities were structured activities, for example sport, and these were summed to form a structured activities scale (Cronbach’s alpha=0.76). The 17 unstructured items included ‘hanging around’, watching movies or videos and playing games, for example (Cronbachs alpha=0.81). The items were factor analysed, and applying a varimax rotation with all Eigenvalues greater than 1, accounted for 55.2 per cent of the item variance. The identified factors were socialising, study pursuits, feminine pursuits, organised sport, masculine pursuits, informal sport, music, computers, and cognitive pursuits.
Using regression analysis, the factor-based model of leisure time provided the best predictor of gambling behaviour, accounting for 24 per cent of the variance in problem gambling scores for boys and 15 per cent for girls. The factor-based model also increased explanatory power after other variables, accounting for 19.8 per cent and 18.1 per cent of variance in gambling behaviour for males and females respectively. Some activities were significantly associated with gambling, including socialising (males and females), involvement with organised sport for males, and for females studious activities such as studying and reading mitigated gambling behaviour.

The leisure activities represented by the feminine and masculine pursuits scales were negatively associated with problem gambling. Feminine pursuits contained social activities such as shopping, eating out and talking on the phone, as well as home-based activities like watching videos, cooking and listening to music. The focus of masculine pursuits were activities such as helping in the garden, building, and hiking which were likely to have been supervised by a parent. Moore and Ohtsuka (2000) suggested that these activities may be representative of pursuits that encourage adaptive development.

An unexpected finding related to cognitively-based games and hobbies being weakly predictive of problem gambling. The authors suggest caution in interpreting this finding, and point to the disparate items in the cognitive pursuits scale. They suggest that the underlying mental exercises of planning, analysing and categorising may account for the relationship to problem gambling in that these skills are utilised by the young problem gambler who seeks to beat the system and the odds in gambling situations. The authors suggested these young people may enjoy the challenge of gambling but be unable to distinguish clearly between games of skill and games of chance, a supposition supported by the finding that young problem gamblers were more likely to believe they could influence whether they won or lost through their own behaviour i.e. superstitious rituals or by positive thinking (Moore & Ohtsuka, 1999b).

Unstructured leisure time was a clearly established risk factor from this research, and has also been identified in delinquency studies (Fisher, 1993; 1994). The authors (Moore & Ohtsuka, 1999b) argued that unstructured leisure time provided more
opportunity for unstructured socialising, which is potentially associated with high levels of boredom. Using gambling to avoid boredom potentially creates an unhealthy dependency, indicative of inability to derive pleasure from other activities, and thereby suggesting a developmental pathway to gambling problems.

**Cognitive approaches**

The most notable Australian study utilising a strong theoretical and cognitive approach to youth gambling was undertaken by Moore and Ohtsuka (1997). Using the Theory of Reasoned Action (Ajzen & Fishbein, 1980) and Weinstein’s (1980) Event Characteristics insights were provided into the rational behaviour governing control, and the cognitive distortions affecting control.

The Theory of Reasoned Action (Ajzen & Fishbein, 1980) showed that intention to gamble was significantly predicted by attitudes and subjective norms (Moore & Ohtsuka, 1997). However, with only 14 per cent of behaviour accounted for by the Reasoned Action model a large proportion of gambling behaviour is not a reasoned or rational action. The addition of personality and cognitive bias variables, as well as allowing for direct and indirect effects, explained a total of 33 per cent of variance in intended behaviour. As the central assumption of the TRA is that behaviour can be performed at will, the study provides a clear indication that some regular gambling is contrary to intention and is therefore associated with impaired control.

A second theoretical aspect to the Moore and Ohtsuka (1997) study was testing the role of cognitive distortions relating to control over gambling. Six items were designed, based on Weinstein’s (1980) Event Characteristics to assess beliefs about winning and losing. The cognitive bias variables measured were 1) perceptions about the likelihood of winning/losing compared to other people, 2) beliefs about the frequency of heavy wins/losses of the general population and 3) beliefs about personal control over winning/losing. Each of the preceding items was operationalised on a 5 point Likert-type scale. The cognitive bias variables provided a measure of the perception that youth believed their own chances of winning were greater than others. The authors reported that the majority of youth were realistic in appraising their chances of winning/losing, but held an inflated perception of the number of ‘big winners’ in the population.
**Skill based attributions – Illusion of control**

In their seminal paper conceptualizing control, Moore and Ohtsuka (1999) tested three conceptualizations of control beliefs in an Australian sample. The two key conceptualizations were firstly, control in the sense of whether to play and when to stop, and secondly, control was measured in the sense of believing in control over the outcome.

Citing Corless and Dickerson (1989), Moore and Ohtsuka (1999) theorized that frequency of play and amount spent are directly within the gambler’s power and thus the first conceptualisation of control was likened to the Locus of Control (Rotter, 1975) in which ideally one internalises the belief that they have the capacity to influence life events such as happiness and achievement. Individuals who describe their capacity for such control as strong are identified as having an internal locus of control. Those who give more weight to the influence of chance or powerful others on their fate are described as having an external locus of control. Internal locus of control in relation to gambling was hypothesised to be associated with non-problem gambling.

Conflicting results from studies attempting to relate locus of control to gambling behaviour have been attributed to confusion among types of control (Moore & Ohtsuka, 1999b). The illusion of control (Langer, 1975) has provided greater specification and therefore the parameters are more conducive to measurement. However, in saying that, definitions of the illusion of control do vary. Whilst Griffiths (1990) has utilised Langer’s (1975) definition of the expectation of personal success to a degree inappropriate to the objective probability, Moore and Ohtsuka (1999) defined the illusion of control as optimism about winning, due to an internal locus of control. Consequently, it was hypothesised that belief in control over winning would be associated with problem gambling.

In total Moore and Ohtsuka (1999) developed 19 items to measure the three aspects of control beliefs. The resulting 5-factor structure (all well within acceptable statistical parameters), accounted for 63.3 per cent of the variance of the control items. The scale scores for each factor ranged from alpha = .80 to .83 with the exception of
cynicism about winning, alpha=.53. Consequently the authors noted that the latter factor should be interpreted cautiously. The factors were:

- Illusion of control - optimism about winning due to internal locus of control
- Need money - want to win to assist financially
- Control over gambling, control over frequency, stopping and budget (Locus of Control)
- Belief in systems, it’s possible to win if you know how
- Cynicism about winning, unlikely I’ll ever win

Illusion of control with respect to gambling was associated with greater frequency of gambling for both sexes. The illusion of control (seven items), need money (four items) and belief in systems scales (2 items) together strongly predicted problem gambling and to a lesser extent gambling frequency. The strongest findings in the study concerned the irrational beliefs that were related to control over gambling for both sexes, with young men in particular holding inflated views about the chance of winning and about controlling chance outcomes. Problem gamblers were even more likely to fit this pattern, a finding that concurs with earlier studies (Ladouceur & Mireault, 1988).

The hypothesis that control over gambling would be negatively related to problem gambling was confirmed for girls only, that is to say their rating of their control capacity was accurate as correlated with a continuous SOGS score. The authors stated that it suggests that young men are less adept at assessing their capacity to control gambling.

Frequency and problem gambling was significantly predicted by a belief in systems (37 per cent for boys and 28 per cent for girls). High scores on the belief in systems and need money scales were strong predictors of problem gambling for both boys and girls. For both sexes, control over gambling was related to cynicism about winning, providing a protective factor against high frequency gambling and problem-gambling. In summary, the illusion of control, need money, and belief in systems scales combined to form a strongly predictive model of problem gambling and, to a lesser extent, gambling frequency.
A further finding was that scoring higher on the problem-gambling scale was associated with the belief in the need for money and that gambling might provide a way to get it. The authors explain this finding by pointing to the relatively powerless status of student adolescents, as they struggle with issues of independence yet are constrained by financial dependence, suggesting this may be a risk factor for problem gambling in itself.

Summary

Gupta and Derevensky’s (1998b) empirical test of Jacobs’ (1986) General Theory of Addictions was undertaken on a large sample and provides a theoretical explanation for why gambling becomes an addictive-like activity. Physiological factors, arousal and emotional predisposition predicted dissociative behaviours which in turn predicted Pathological gambling. The mechanism has a physiological basis, in which abnormally high arousal states are relieved when one dissociates from reality by engaging in repetitive gambling behaviour. The need to dissociate occurs because of underlying problems such as anxiety, relational and familial problems, and low-self esteem.

The developmental theme presented by DiClemente et al.’s (2000) theoretical stages of change model builds on the underlying causes of Pathology. DiClemente et al. (2000) proposed five stages that describe the process of Pathological gambling from initiation to cessation. This view emphasises individual differences in vulnerability to Pathology, and advocates improving life skills which influence a youth’s ability to cope with gambling problems. This model assumes that adults have had more time to develop sources of satisfaction, self-esteem and money management skills, and hence have a greater likelihood of being able to regulate gambling. Consequently youth may be at higher risk if their development has not yet fostered such skills. Unlike adults, the time elapsed between the onset of gambling and the experience of problems associated with the onset is relatively short for youth. It is therefore possible that interventions can address the initial problems and prevent the addictive behaviour from becoming integrated into the lifestyle, or into their identity.
The delinquency theme in the literature has close ties to developmental themes, in particular identity formation. Risky behaviours, within which gambling has been included, can be a means of experimenting with non-conformist activities which define the young person’s position in the world. The measures of delinquency over the past ten years have varied, ranging from truancy and video game play in the UK (Fisher, 1992) to more recent studies from the US measuring criminal acts and maladaptive psychosocial indicators (Stinchfield, 2000). Substance use has also been grouped with delinquent behaviours because of the illegalities associated with drugs or underaged alcohol and tobacco consumption. Concurrent studies have adequately demonstrated that youth involved with gambling are also involved with delinquent or risky activities (Winters & Anderson, 2000). A longitudinal study (Ladouceur et al., 1999b) has shown that deviance can be predicted by personal, familial and social influences, and when controlled for, the relationship between gambling, delinquency and drug/alcohol use was considerably reduced, although still significant. The findings suggest that some delinquents gamble and some gamblers are delinquents, but the overlap between the groups is insufficient to explain the cause of problem gambling.

The cognitive approach to problem gambling focuses on the quality of thinking the gambler engages in. Erroneous cognitions and misperceptions, lead youth to believe they can control random events, and over time, may generate erroneous skill-based attributions for wins. This has been explained by the Illusion of Control theory, in which cognitive development has not overcome illogical/irrational decision making. The illusion of control was also applied by Australian\(^1\) researchers Moore & Ohtsuka (1999b) confirming that irrational beliefs were related to a belief in control over gambling, particularly so for young men who held inflated views about the likelihood of winning and controlling chance outcomes. Similarly, youth were shown to be more likely to believe they could influence whether they won or lost through their own behaviour (Moore & Ohtsuka, 1999b).

Further findings from Australian research include developmental themes which link to the association described by Fisher (1993; 1994; 1995) between unstructured leisure

---

\(^1\)Using the SOGS (Leisure & Blume, 1987) as a continuous variable.
time and delinquency. In a large sample unstructured leisure time was a clearly established risk factor for problem gambling, providing more opportunity for unstructured socialising, and boredom (Moore & Ohtsuka, 1999b). The use of unstructured leisure time has provided the best research finding to date that without guidance or goals some youth do engage in undesirable social behaviours and that gambling may be one of them.

A common element underlies the youth literature reviewed. There is little research that separates gambling from the life context of the individual. This is exemplified in the works of Jacobs, Derevensky and Gupta, and Moore and Ohtsuka in particular. Given these strong links between managing the everyday vicissitudes of life and gambling behaviour, it seems remarkable that more researchers have not pursued a developmental approach. By definition, youth are in a transitory phase, accepting greater self-responsibility and pursuing greater self-definition. Maturational skills are being learned and consolidated, and as such their application can be laborious and intermittent. Little is known about the relationship between developmental factors and safe gambling, however it is generally accepted that prevention and recovery from gambling related problems is assisted by well developed social skills and self-control.

**Australian approach to impaired control**

The major influence in gambling research to date has been the DSM (APA, 1980; 1994) conceptualisation of mental disorder. A scan of the literature between 1993 and 1998 for example, revealed that almost 90 per cent of published works on the impacts of gambling used a DSM, or DSM derived diagnostic screen (Dickerson & Baron, 2000) such as the SOGS (Lesieur & Blume, 1987). The mental disorders model from which the DSM instruments arose dates from an era when subjective control in the addictions such as alcoholism was viewed as either being present or absent, with the individual having little or no capacity to regain control once the illness had developed (Paredes, cited in Miller & Brown, 1991). Consequently, addictive behaviours were seen as an abnormal condition, i.e. a mental disorder, over which people were unable to exert volitional control. At the time this was preferable to being viewed as immoral, having character weaknesses and/or an
insatiable greed for wealth (Arnold, 1977). None-the-less conceptual and methodological problems have accrued from this approach.

In a body of research dating from the 1970’s, Dickerson and colleagues have emphasised the methodological limitations that occur when commencing research from a mental disorder paradigm. In a position paper on the future of gambling research, (Dickerson & Baron, 2000) addressed the key methodological limitations engendered through the DSM approach. It was argued that the criterion used by DSM (APA, 1994) and related screens to diagnose a pathological gambler was so heterogeneous that identifying truly independent variables, i.e. those predicting Pathological gambling but not related to any of the criterion, was very difficult. Most significantly the broad nature of the instruments were the cause of incorrectly classifying non-pathological gamblers as pathological gamblers (type I error). A Canadian report entitled the Nova Scotia Video Lottery Players’ Survey (Schellinck & Schrans, 1998) paraphrasing Dickerson (1993) recently noted that “this type of error is increased ... when these screens are used in general population samples ...”, for which they were not intended. The combination of these three factors, the broad nature of the instrument, the use of the instrument in non-clinical samples and increasing social acceptance (i.e. participation) of gambling brought to prominence concerns about potentially inflated prevalence estimates derived from the screens and a need for contemporary conceptualisations of gambling to suit the social milieu of the times (Dickerson & Baron, 2000) and to take advantage of the new methods available to improve the design of psychometric instruments.

To address these issues, an approach that Dickerson and colleagues have taken is to focus on the paramount dimension of the existing DSM-IV-RT (APA, 2000) criteria for Pathological gambling, namely, the core psychological construct of the addictive behaviours, subjective control, and the process that maintains and erodes the experience of being in charge of one’s behaviour. By focusing on control over gambling behaviour, Dickerson and Baron (2000) argued research could be progressed in a number of ways: Firstly, by establishing construct validity in a contemporary context; secondly by identifying the circumstances under which impaired control might be an adaptive response, if at all; and thirdly, by providing theoretical explanations of the psychological processes that impinge on control. This
approach assumes that a choice occurs in behaviour and that subjective, volitional control of time and money will be reflected in those choices. This theme has been demonstrated in alcohol studies, in particular by the craving studies of the 1970s reviewed by Heather and Robertson (cited in Baron, Dickerson & Blaszczynski, 1995). Even dependent alcoholics exhibited positive aspects of control over their drinking behaviour. Control was demonstrated by tapering off drinking toward the end of trials to avoid withdrawal symptoms; by working for and drinking only moderate amounts of alcohol rather than stockpiling; by no recorded attempts to drink all alcohol available even when possible; and by no attempts to drink continuously at any time. In carrying out these behaviours, alcoholics demonstrated a capacity to regulate their drinking behaviour in ways that benefited them. As yet a similar understanding of control exerted by problem gamblers is unavailable but for this behaviour too, it seems that control will not simply be “lost” but will vary within each person by degree, from context to context and from one time to another.

**Choice control and context**

In approaching the study of gambling from a choice/control perspective Baron et al. (1995) took the view that behaviour is the user’s choice, dependent upon motivations and intentions within a particular context. This departs radically from the notion that gambling is a state in which the driving force for independent action is beyond the control of the individual (Marlatt & Parks, 1982) as proposed by mental illness approaches. The study of such variations in control will contribute to an understanding of the necessary and sufficient characteristics of controlled gambling (Corless & Dickerson, 1989) and specify the context that increases a person’s vulnerability to lose control. It is probable, for example, that control is relinquished without dysfunctional causes (Dickerson, in press). In fact, a function required of any leisure activity is to promote a feeling of ease achieved partly by the relaxation of self-control. Consequently, the processes of the regular player who relinquishes control while gambling and loses may be quite different to another regular player who is similarly persistent, and reports feeling out of control and spending more than intended. For the former it is a measured leisure response and for the latter a failure to adapt to the context.
Measuring control

Currently, impaired control is represented by two out of ten DSM-IV (APA, 1994) questionnaire items. In DSM III (APA, 1980) impaired control was considered in terms of a) difficulties in resisting an impulse to gambling and b) continued gambling in the face of adverse financial, personal and social consequences (Corless & Dickerson, 1989). In DSM-IV (APA, 1994), items 3 and 4 respectively refer to repeated unsuccessful efforts to control, cut back, or stop gambling and restless or irritability in the process. Similarly the SOGS devotes two items to control: gambling more than intended and believing that control is not possible even in the presence of a desire to stop.

Measuring Control by time and money

The degree of control exerted over gambling has generally been inferred from excess via measures of time expenditure, money expenditure and Harms accruing. The relationship between impaired control and time and money spent on gambling are generally positively correlated but the approach often leaves a significant portion of the variability in self-control scores unexplained (Corless & Dickerson, 1989).

O’Connor (2000) measured control of expenditure on gambling with 19 items relating to likelihood of beginning and likelihood of continuing to play while losing or winning. The key control item was “How often have you spent more money than planned in the last five sessions?” The 19 items were divided into internal and external factors. The internal items were created from a strong body of confirmatory literature and included items about the emotions of depression, loneliness, disappointment/frustration and excitement/celebration. Problem gamblers differed from high-frequency players on two items in particular. Firstly, in frequency of beginning a session and secondly in continuing a losing session if there were pressing debts. Loneliness or mild dysphoria was also associated with increased persistence when losing. Corless and Dickerson (1989) make the link between impaired control and chasing, and also the subsequently well established link between impaired control and emotion focussed coping (Shepherd & Dickerson, 2001).

Another way that control has been measured is via harmful impacts. The underlying assumption is that continued gambling in the face of Harms is indicative of control
problems, because a person would not continue to generate harm to self and others if they could avoid it. Several authors have advised separating the harmful impacts from the measure of problem gambling (Wiebe et al., 2000) and in particular, Dickerson (2000), argued that there are a number of advantages to be gained in doing so. Most importantly, how an individual experiences the consequences of their gambling behaviour is removed from being the central focus of study. This shift in the framework of research acknowledges that gamblers are a heterogeneous group of people, and because of individual differences, both personally and in their environment, will experience the ‘impacts’ differently. This separation is one of cause and effect, yet acknowledges that the harmful effects of gambling become causal when gambling reaches a crucial point of involvement for the individual (Dickerson, 1993). Secondly, Dickerson argues that removing the Harms will encourage researchers to narrow the focus to investigate key characteristics of the pathological gambler criteria, i.e. control, thereby promoting the development of theoretical links with mainstream psychology.

With the foregoing arguments in mind, the preferred approach to the explanation of gambling has incorporated choice, and a new screening instrument has been designed to measure this dimension. The Scale of Gambling Choice is documented in Baron et al. (1995). In brief, data was collected over five years during 1991 – 1995, from three states of Australia. The data sets were collected for a national study conducted in 1991 (n=287) a clinical data set gathered during 1993 and 1994, from a hospital inpatient behaviour therapy unit who met DSM-III (APA, 1980) diagnostic criteria for Pathological gambling (n=100), from a stratified random sample of Western Australians collected in 1994 (n=204) and a 1994 random stratified sample of Tasmanians. The objective of the study was to analyse nine items\(^2\) (Appendix 7) relating to attempts to limit gambling. Responses were given on a 5 point Likert-type scale ranging from never through to always. The item dimensions were:

- lost more than intended
- spent more than planned
- spent all cash
- no desire to reduce spending

\(^2\) The first item related to Study 2
- desire to stop/want to stop
- never tried stopping
- difficulty in trying to stop
- spent more than planned on last five occasions
- achieved total abstinence over two years

The national study collected in 1991 and a clinical sample collected during 1993 and 1994 were analysed with three factors resulting. The first factor related to success in limiting or stopping gambling, the second related to attempts to limit or stop and the third related to temptation to gamble. Taking account of the redundancies and cross-loadings in the National sample and Clinical dataset, the authors revised the 18 items to form the psychometric instrument named the “Choice/Control scale”. The scale was administered in the subsequent Western Australian (Dickerson, Baron & O’Connor, 1994) and Tasmanian (Dickerson, Walker & Baron, 1994) data collections with an acceptable internal reliability coefficient (alpha=0.76) and a good test-retest reliability coefficient of .98 in both datasets. In the Western Australian sample three statistically consistent factors were identified, being 1) ability to control gambling, 2) intentions to limit gambling, and 3) failure to control gambling.

The authors acknowledged that during the evolution of the scale some factors remained difficult to interpret, and the structure of the items may have compounded the problem because items shared core phrases such as “I’ve been able to...” and “I tried to stop...” noted as problematic in psychometric design (de Vaus, 1991). Analysis of the Tasmanian sample revealed the same three factor structure as the Western Australian sample, but an anomaly was noted in that item 9, which previously loaded highly onto factor 1 (in the Western Australian data), formed a single item factor of its own. However, the modified Scale of Gambling Choice used in the Western Australian and Tasmanian data produced clear factor structures accounting for 61.7 per cent and 64.6 per cent of the variance respectively. The scale had good initial psychometric statistics which validates the authors’ viewpoint that subjective control or choice of gambling behaviour is a crucial factor to measure.

The Scale of Gambling Choice (Baron et al., 1995) shares with theories of self-regulation (e.g. Diaz & Fruhauf, 1991) the founding premise that the user has some
element of choice in their motivations and intentions within a particular context. The research to date has used a variety of direct and indirect measures of impaired control. The more direct measures, such as those in the Scale of Gambling Choice (Baron et al., 1995) consist mainly of self-statements that indicate an awareness of the way in which a person's gambling does not match some preferred standard. Also, an awareness that even with effort, such a standard cannot consistently be achieved. This is indicated by affirmative responses to questions such as lost more than intended, spent more than planned, found it hard to give up or stop (Dickerson, 1993). Although most people who gamble regularly do seem to be able to describe preferred levels of expenditure or limits to their losses, it must be acknowledged that this is not always the case. For some individuals it has been difficult to establish whether they actually had any preferred limits to their gambling (Dickerson, 1993). Gambling appears to cease only when they lose all of their money and possibly borrowed money as well.

With impaired control being defined in terms of difficulties or failures to achieve certain standards, its measurement relies heavily on unstated standards for behaviour (Dickerson, 1993). To improve the accuracy of this research approach, the nature of the behavioural standard requires specification. By identifying the goal, an individual may know what they require of themselves in terms of self-control. This is important because the self-control process requires not only a knowledge of the definitive standard, it also requires knowing how to achieve the standard. Without such specificity the standard underlying the behaviour remains implicit, and difficult to extricate from environmental influences and from the individual’s capacity to steer a chosen course of action (Corless & Dickerson, 1989).

Ongoing research into the psychological processes that influence control over gambling has shown promising developments relating to cognitive biases (Boyer & Dickerson, 2003), Regret Theory (O’Connor & Dickerson, 2003) and dysphoria (Hills, Hill, Mamone, & Dickerson, 2001). There has however been no research focussing on youth gambling, a group that international research, despite its empirical disagreements and findings, has shown to be at risk of significant harmful impacts arising from their developing engagement in gambling. Despite these consistent findings the few specialist clinicians available report that very few youth present
themselves for treatment (Dickson, Derevensky, & Gupta, 2002) a concern that Winters and Anderson (2000) suggest may be due to lack of awareness of the issues, low Pathology rates or the overlap between psychosocial factors and control of gambling.

Following from Chapter 3, the principal aim of this doctoral thesis was to identify how some youth manage to gamble regularly once per month or more often without the activity giving rise to excessive gambling related harms. The key questions are: How do youth who may not yet have attained the self-regulatory skills associated with adulthood, exert control over their gambling? Do they set limits, and if so how are limits maintained. In short, what is the process that leads to relinquishing and maintaining control over gambling?
Chapter 4: Methodology

The substantive issue in this thesis is a focus on subjective control of gambling in a developmental context. In the design and use of measures of problem gambling, given North American and UK studies, the assumption has been that the harmful impacts experienced by youth will mirror those found for adults. With the lack of qualitative studies on youth gambling, it was essential to use a methodology which would provide empirical validity to the research process, by allowing the voice of youth to be heard, and in order to focus on subjective control. The objective was to use a qualitative method as a starting point and then develop and consolidate emerging research themes using other quantitative methodologies.

Chapter 4 outlines the conceptual methodology of this thesis. The design comprised three studies, each using a different methodological approach. The three studies are presented with their procedural method sections accompanying them.

Because this thesis was structured as three sequential studies it uses a journal article format in which each study is presented as a unit, complete with an introduction and methods, results and discussion sections. Consequently, the main methods chapter (Chapter 4) provides a conceptual argument for the use of mixed methods (qualitative and quantitative). Each separate study then contains a 'procedural' method in which complete details of the sample, procedure and measures are provided (see pages 74, 140 and 185 respectively). Table 3 (page 61) summarises the methods, data collections and analyses used throughout the three studies in this thesis.
### Table 3: Study Design and Data Collection

<table>
<thead>
<tr>
<th>Method of enquiry</th>
<th>Data collection 1 (N=34)</th>
<th>Data collection 2 (N=1008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limit</td>
<td>Psychosocial Maturity</td>
<td>Temptation and Restraint</td>
</tr>
<tr>
<td>Setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grounded Theory</td>
<td>Content Analysis</td>
<td>Structural Equation Modelling</td>
</tr>
<tr>
<td>Semistructured interviews; snowball sample</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Telephone survey; stratified, random sample</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Qualitative methodology (text-based analysis)</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Nudist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantitative methodology (numeric-based analysis)</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>SPSS</td>
<td>SPSS</td>
<td>Lisrel V8.2</td>
</tr>
</tbody>
</table>

Study 1 presents a mixed methods approach in which semistructured, text-based data is analysed qualitatively, with some syntheses of quantitative techniques. Using a different subset of the same semistructured interviews, Study 2 applies a content analysis, an essentially quantitative approach to using text-based data. In Study 3 a separate, random and stratified data collection was analysed using structural equation modelling techniques; also a quantitative approach.

### Conceptual method

The task of a methodology section is twofold; it has a duty to provide the philosophical orientation that has given rise to the study, and is required to outline the conduct of the study at a procedural level. For the reader’s convenience, procedural information is provided prior to analysis in each chapter. To provide the conceptual
orientation to the study, one must define the paradigm in which the study is situated. Historically, the social sciences recognized dichotomous paradigms; the positivist paradigm from which methods based on the natural sciences emerged, and the opposing interpretivist paradigm which gave rise to methodologies that recognised the social nature of human experience (indeed thought that it could not be interpreted without it) and looked to interpret meaning through social interactions.

If a paradigm is defined as a formal body of knowledge, or an orientation accepted and agreed upon by scholars, there is a wide margin for specifying a paradigm (Robson, 1993). Research has become very sophisticated in its propensity to place before the researcher a wide variety of means of collecting, analysing, interpreting and reporting on data. Add to this diverse collection of styles the call for interdisciplinary research as a means of providing thorough and extensive answers to research questions (Guba & Lincoln, 1998), and the researcher is left with a question mark about just exactly what a paradigm is and indeed, what paradigm their work fits within.

Historically the paradigm in which a study was located was determined by the discipline of the scholar. The three main paradigms for research were the empirico-analytical paradigm, the interpretive paradigm and the critical research paradigm, which stem from the philosophical stances of positivism, idealism, and realism, respectively (Higgs, 1997). Purists held that these paradigms were incompatible because of underlying assumptions, such as objectivity versus subjectivity, and as such, mixed method approaches were logically incompatible. Pragmatists acknowledged differences across paradigms, yet focussed pragmatically on the best means of investigation given the complexity of research inquiry and social phenomenon. A third group – taking a dialectical stance, acknowledged the importance of differing methods of inquiry and proposed that through the synthesis of the paradigms, richer and more accurate understandings could be generated Greene & Caracelli, 1997).

Such eclectic approaches to research have gained favour in recent years. Interdisciplinary collaboration has been successful in opening up new methods of discovery and in breaking down traditional barriers which hark back to the
positivist/interpretivist paradigmatic split (Bazeley, 1999). One such barrier which continues to echo today, albeit more quietly, is the ontological and epistemological debate that passed from Philosophy to Psychology, pushing psychologists to aim for rigorous methods such as falsifiability, in order to support the positivist dictums stemming from the natural sciences. The debates on the positivist/interpretivist paradigms surface more in research programs which employ methods that fuse the traditional bounds of enquiry, that is, at the intersection of qualitative and quantitative techniques. Both techniques are informative, yet how we know what we know comes to us in different and complementary ways from each. It is now widely recognized that there has always been a level of mixing (e.g. interviews undertaken in order to design an appropriate questionnaire), which has gained momentum particularly in the last two decades (Bazeley, 1999).

One method of combining the two paradigms is Triangulation (Denzin, 1978). Triangulation involves the use of multiple data sources, methods, investigators and/or theories in pursuit of the same question because they contribute to greater reliability of results. This approach assumes that the links which previously constrained methods to philosophical systems restricted the practical considerations of the best choice of tools and techniques for the research task. As research has become a more eclectic endeavour, is more complicated and multi-dimensional now than 20 to 30 years earlier (Punch, 1998) a wider array of tools and choices have been developed to reflect the fact that much research occurs in real time and real places.

**Mixed methods**

The tension in mixed method inquiry is that each paradigm offers a meaningful and legitimate way of knowing and understanding. The underlying rationale is to understand more fully, to generate deeper and broader insights, and to develop important knowledge claims that respect a wider range of interests and perspectives. The level of integration in mixed method studies varies. A typical mixed methods study is one in which a qualitative stage informs the design and implementation of a quantitative phase, or the reverse (Greene & Caracelli, 1997). In this style of mixed methods study, data analysis occurs only within the paradigm which decreed its style and data collection method. Data from the two phases are complimentary in that
each seeks to explain a phenomenon, and does so from differing paradigms reflected in the methods employed (i.e. quantitative versus qualitative analysis).

Such research typically occurs in a sequential fashion. Commonly, qualitative-quantitative designs remain as two separate elements of the study and are integrated only at the final report or dissertation. The comparison of results from parallel or sequenced components of the design are used so that results from one study inform the design of the subsequent study (Green & Caracelli, 1997). In component designs the methods are implemented as discrete aspects of the overall inquiry and remain distinct throughout the inquiry. The combining of different method components occurs at the level of interpretation and conclusion rather than at prior stages of data collection or analysis. Complementarity designs are those in which results from one dominant method type are enhanced or clarified by results from another method type, an extension can be readily made from the method to the paradigm level. Using interpretivist interviews that aim for depth and contextual relevance to supplement positivist surveys conducted for breadth and representativeness might be considered a classic complementarity component design.

In contrast to component designs, integrated designs generate dialectically transformed understandings and insights. This process typically occurs, for example, when text based interview data is exported in a numeric format to a quantitative software package. Quantitative analysis can then be undertaken on what was originally qualitative data and the results can be fed back into the qualitative analysis to further define understanding (Bazeley, 1999).

At a still higher level of integration, qualitative and quantitative data are used interdependently in the same set of data, in an essentially “fused” (Bazeley, 2002a) methodology. In such a mixed methodology, different types of data and methods of analysis are used to develop, extend or otherwise inform each other in a holistic or iterative way at various stages through the data gathering and analysis processes (Bazeley, 2002a). Mixed methods may be used at different stages in the research process. At the data gathering and analysis stage, mixed methods might serve to corroborate or elaborate interpretation, or to develop and/or initiate new ideas and understanding (Rossman & Wilson, 1985). A common example is the inclusion of
demographic or other categorical information in a qualitative database, or the export of coding information from a qualitative database to be included as variables in a statistical database (Green & Caracelli, 1997).

**Grounded theory and qualitative analysis**

Qualitative researchers argue that all information is data (Guba & Lincoln, 1998). Literature is data and in well conducted qualitative studies is therefore intricately interwoven with empirical results. From this viewpoint it is possible to argue that a literature review is one type of qualitative analysis, given that the data on which one operates is text-based. On amassing and evaluating such data, the authors provide their interpretation of numerous studies and argue inductively for a position or stance that the literature can support. The numerous interpretations of the literature are a testimony to healthy debate and argument in the research tradition.

The inductive process of interpretation employed by the qualitative researcher has come to have several prescriptions in order to gain credibility. Such prescriptions are arguably even more important in psychological studies than sociological studies, because in psychology positivist methods have set a benchmark of rigour for credibility (Robson, 1993). Qualitative researchers have advanced their methodology by striving for similar standards and consequently qualitative textbooks over the last 10 years have called for systematic processes in research. Yet systematising the process is antithetical to the aims of qualitative enquiry, in which approaches, such as grounded theory, compel the researcher to be guided, pulled and persuaded by the data itself (Bazeley, 2002a).

Qualitative methods have increased in popularity in psychology as their value has become apparent. The contribution of qualitative methods to theory development has lead to an insurgence in qualitative analysis, which has in turn prompted the development and refinement of rigorous qualitative methods of analysis. One method within this general approach is Grounded Theory pioneered by sociologists Strauss (1986) and Glaser and Strauss (1967). Grounded theory has its genesis in Symbolic Interactionism which proposes that research participants will necessarily view or construe the object of research in different ways. By virtue of the various labels they are assigned: respondents, subjects, participants or informants (Barbour,
they play different roles and have different relationships with the research focus (Bazeley, 2002b).

The grounded theory process requires the researcher to position themselves in the world of the participants, viewing actions from their perspective, whilst simultaneously standing back and asking questions about what the participant takes for granted. This notion of marginality (Bowers, 1989) enables the researcher to view the participant’s world from inside while maintaining sufficient distance to raise analytic questions.

Grounded theory consists of a set of systematic procedures that seek to inductively derive a theory about a particular phenomenon. Typically, concepts are inductively derived from an initial set of qualitative descriptions or scripts, which once coded into rudimentary categories, lead to the collection of more descriptions or data.

Constant comparative analysis is the process of coding data to develop concepts which are then refined by reviewing and comparing other data. On the basis of these comparisons concepts may be confirmed, discarded, refined or elaborated, and their relationships to one another are explored. For example, in this study comparisons were made between gamblers who exhibited characteristics of high and low risk gambling behaviour.

Accordingly, there is a progressive development of categories as the research project unfolds. The process of model building is dynamic and sensitive to patterns detected in the data. The process keeps the researcher close to the data and forces a focus on developing categories – such categories may then be used in quantitative evaluation. The particular value of this approach lies in the methodological prescription that allows theory to emerge from the data rather than approach a research question with preconceived theoretical ideas. Requiring an investigator to pay close attention to emerging patterns in the data ensures that resultant theory is empirically responsive and relevant.

The methodological thrust of the grounded theory approach to qualitative data is toward the development of theory without any particular commitment to specific kinds
of data, lines of research or theoretical interests. Rather than prescribe a specific method or technique, it is a style of doing qualitative analysis whereby constant comparisons are made between the data and the coding paradigm to ensure conceptual development and density (Robson, 1993). Emphasizing the complexity of phenomena and the unexpected contingencies affecting the personal and social phenomena under study adds a temporal dimension to the analysis.

**Study design**

The grounded theory mode of analysis has been used successfully in studies of drug addiction (Biernacki 1986; Rosenbaum, 1981; cited in Strauss, 1987). The current study utilized the Grounded Theory approach. Although the distinctive element of theoretical sampling was not applied, pilot interviews provided the opportunity to reframe and refine interview questions in the same way that the analysis of initial interviews refines the information sought and questions asked. The general literature on qualitative methods addresses reliability and validity of data analysis procedures and reporting results (e.g. Miles & Huberman, 1994). Guba and Lincoln (1988) argued that the concepts of validity and reliability developed for the positivist paradigm (or quantitative approach) do not apply to naturalistic methods in the social sciences. Nevertheless, there is a large volume of literature on validity and reliability in data analysis, collection and reporting due to the increasing use of qualitative methods in several disciplines (Ottenbacher, 1992; Riger, 1992; Sandelowski, 1986; Walker, 1989). There has been less attention to qualitative rigor in the discipline of psychology. The approach adopted in this study to improve the validity was to clarify research questions and then align the design and methods with those questions. Thus, the influence is predominantly from question to method (Higgs, 1997) to develop a logical chain of evidence (e.g. see Patton, 1989). At the analysis level, the integration of analytical techniques ensured the *links* in the chain of evidence were strengthened by varying methodological approaches.

Integrating qualitative and quantitative methods provides a number of benefits. Firstly, the mixed approach provides greater sensitivity to variations in the data, where for example, splitting coded qualitative data by a demographic variable provides further insights and generates further questions. Most important to the current study is the way in which qualitative detail can be examined in the broader
quantitative picture, satisfying requirements for generalisability and modelling causality (or at least prediction) from a grounded theory basis (Bazeley, 1999).

Table 3 (page 61) shows the combination of methods used in this thesis. The procedural method detailing how each was operationalised can be found prior to the results section in the relevant chapters.

**Study rationale**

To understand the problem of control for the individual attracted to gambling a number of assumptions about the process determined the type of study to be undertaken. Firstly, implicit in self-control is the individual’s capacity to plan behaviour and to execute that behaviour. A study of self-control of gambling therefore requires consideration of the cognitive functions of the individual, to determine the efficacy of turning thoughts into action. In the first instance, self-directed behaviour is a measurable, quantifiable phenomenon that could be investigated using existing theoretically substantiated and statistically validated psychometric instruments. To impose the limitations of a single method of enquiry, particularly one involving methods and scales established for other settings, onto the foundations of research into young adult gamblers would, however, be a great disservice to the individuals in that it restricts researchers and practitioners striving for ways to understand and prevent the catastrophic series of disasters that befall some people who engage in addictive behaviors. Consequently, the following two assumptions were of paramount importance in designing this study.

The first assumption was that being involved in gambling suggests that the individual shares some of the documented characteristics of addictive behaviours, such as those described in the extensive literatures on eating disorders and substance abuse. The nature of people troubled by addictive behaviours is such that maintaining self-control more often than not exceeds the resources of the individual. Success or failure of control, has implications for how individuals perceive themselves and their capacity for control, and are accompanied by a range of emotional responses.
Secondly, the developmental history and current life context of each individual interacts with their capacity for control. Life circumstances vary in the degree in which they challenge an individual to consciously focus on, choose between and employ options that may not be consistent with their beliefs and desires. These two assumptions implicate the individual's emotional response to circumstances. The ability to mediate one's emotional response occurs through the psychological process of self-directed behaviour and can be viewed as a parallel process to the self-control of addictive behaviours. Hence the need for the grounded theory approach, to understand the process.

The rationale underlying this study is that regardless of the extent of gambling involvement (i.e. variations in time and money expenditure) associated with the harm arising from their gambling, the individual's subjective experience of harm will be reflected in the quality of their life. The cyclical effects between gambling related problems and personal and social problems will feed back into the capacity for control over gambling. In this way, this study also exploits an element of the phenomenological approach, which posits that there is a structure and essence of the phenomenon of gambling control for each individual.

**Design considerations**

Increasingly mixed methods studies are being deliberately designed to employ and work with data in forms and ways that recognise the complexity of the human subject and the inadequacy of any one approach to developing knowledge and understanding of the human condition (Bazeley, 2002a). Emphasising integrated research paradigms creates an awareness of the ways in which the methodologies of our disciplines restrict research potential. By utilising a wider range of methodological tools answers to complex questions can be pursued more effectively (Bazeley, 2002a). As Green and Caracelli (1997, p.7) note “All methods have limitations and biases; using multiple methods can help to counteract some of these biases”.

This thesis utilises the position of both the pragmatist and the dialectical stance. Pragmatically a search for the best means of finding answers to the problem of youth gambling has occurred – striving to ensure the data is “situationally responsive and
relevant" (Green & Caracelli, 1997, p.10) and is committed to an empirical perspective. The dialectical stance seeks "to understand more fully by generating new insights" (Green & Caracelli, 1997, p.10) that would otherwise be missed if research were restricted to a single (pure) paradigm. Both the pragmatic and dialectical approaches move research into a contemporary mixed method era in which the approach to a study is dictated by the types of questions posed.

While valuing the contribution and power of the positivist approach, its capacity to enquire fully into the social world and the individual human experience is limited. It is especially limited in generating new insights because these are hard to predict. The qualitative study was designed specifically to provide new insights about a process, that of how gamblers maintain and relinquish control over gambling. A how question requires participants to explain their understandings, and this information is best accessed through text based data in a qualitative design. Qualitative designs can be subject to any number of methodologies, such as phenomenology, grounded theory, ethnography etc. Neither phenomenology nor ethnography were appropriate methods for this study because each is concerned with socially prescribed meanings that individuals attribute to their behaviours. The grounded theory methodology was the best methodological fit to this particular psychological study because it allows for the idiographic nature (individual differences) of peoples' attributions for behaviour, and places that behaviour in appropriate context. A method as extensive as grounded theory acknowledges that the individual's characteristics alone are insufficient to explain outcomes that are contextually situated in the person's environment.

Following on from this discussion of mixed method research approaches, results are presented in three parts. In Study 1, a grounded theory approach to the qualitative synthesis of the process of maintaining and relinquishing control in gambling is provided. Study 2 utilised an essentially quantitative research approach through the application of a content analysis methodology. In Study 3 a structural equation model identified the multi-dimensional nature of control of gambling behaviour. The methods and procedures utilised in the latter two studies are provided prior to their respective results sections.
Chapter 5: The Limit Maintenance Model

Introduction to Study 1: The Qualitative Study

Chapter 5 presents the first of two stages of a qualitative study identifying the limit setting behaviours of regular youth gamblers. The model building process presented in Chapters 5 and 6 (Stage 1 and 2 respectively of the Limit Maintenance Model) was a concurrent analytical process. The information is presented sequentially in two chapters for simplicity only.

Research aims and methodological considerations

Given the sizeable estimates of youth reporting harmful impacts from gambling, the question arises as to why they continue gambling despite the severity of the consequences. The aim was to identify the process of how some youth maintain sustainable levels of gambling (i.e. low impact) whilst others succumb to excess (Orford, 2001). A key issue raised in Chapter 3 was whether youth set limits to their gambling, and if so, how the limit setting process unfolds. The nature of this research question necessitated an exploratory approach and a qualitative method was particularly useful in this instance as there was little research in the specific subject areas, and existing understandings had not progressed knowledge of limit setting behaviour.

It has been stated that research and theory building may be better progressed by artificially separating the harmful impacts of gambling from the subjective sense of impaired control (Dickerson & Baron, 2000), arguably the core construct of the addictive behaviours (Heather, Miller & Greeley, 1991). This was achieved by using the reported harms as post-hoc validation for the model only, not as integral to model building. Consequently, this study sets out with the proposition: That artificial separation of cause and effect will facilitate the understanding of the psychological processes that maintain and erode control over gambling behaviour in youth. The underlying assumption in this approach is that applying and maintaining self-control
is mediated by a number of psychological, behavioural and situational factors, and gamblers can increase their capacity for self-control.

Typically, theory development includes an explicit temporal factor and focuses on proximal causes. The data from the sample was collected in actual venues immediately following a gambling session. Thus, participants were asked about how they controlled their gambling in a current, real-life situation. For example, the degree of awareness of the potential harms accruing from gambling, the extent to which the gambler can articulate and apply personal behavioural strategies for control, and the degree of harm being tolerated, formed the basis of a richly descriptive, yet analytic account of the control process. The impact of vulnerability factors, such as participant’s skill in maintaining inter-personal relationships also arose as an important addition to the control process.

**Model orientation**

The starting point for the qualitative study was the finding that 31 youth had a specific limit in mind when commencing a gambling session, while just three youth had no set limit in mind. A schematic overview summarising the emergent limit setting model (Figure 1, page 73) is presented below to orient the reader. The model had two distinct starting points and two distinct outcomes. Moving from either starting point to either outcome involved five qualitatively different behavioural patterns. Successful limit setting was gauged by whether youth adhered to their limit or whether they exceeded it and spent all their available funds.
Figure 1: Schematic overview of the Limit Maintenance Model

A small group of three respondents had no specific limit (NSL) in mind when they started a gambling session and hence left the venue without spending more than they deemed acceptable (usually less than $40). Each of the remaining four groups started with a specific limit in mind. The target limits (TL) group successfully met their limit, and in four cases ensured they did so by carrying only the target limit amount of cash with them. The single revised limits (SRL) group did reset their limit once, but adhered to the revision, and were therefore successful in their outcome. The revised limits (RL) group succumbed to a pattern of continually revising their limit and gambled until they eventually spent all their available funds. During this process the futility of their limit was noted as they realised there was little likelihood they would adhere to it. The broad limits (BL) group were evasive, setting limits with a wide margin and eventually respresenting the limit as a win limit. A more detailed schema is provided at page 79.

The questions of interest that evolved from the early data analyses were what strategies supported the maintenance of various limits, how these strategies were
formulated or acquired, how they were maintained in the face of competing action
tendencies (Kuhl, 1992) and under what circumstances control wavered.

**Procedural method**

**Ethics Clearance**

Clearance was received from the University of Western Sydney, Macarthur, Ethics
Review Committee (Human Subjects) in January 1997 to conduct the qualitative
interviews; protocol number 97/120. To protect the identity of respondents
pseudonyms were assigned and appear throughout this thesis.

**Semistructured interview design**

It is not possible, nor desirable, to conduct research in a totally theoretically neutral or
value free manner. The author applied her knowledge of all existing gambling control
survey items from the SGC (Baron et al., 1995), the DSM-IV (APA, 1994) and related
versions, and the SOGS (Lesieur & Blume, 1987), as well as undertaking an
orientation in the self-regulation\(^3\) literature (in particular, the works of Ryan and
colleagues dating from 1981 through to 1999, Baumeister, Heatherton & Tice, 1994;
Tice, Bratslavsky & Baumeister, 2001; Carver & Scheier, 1999). This starting point
was integrated into a developmental approach appropriate to the study’s age group,
and mindful of the developmental approach of addictions researchers Diaz and
Fruhauf (1991). Following a period of pilot testing\(^4\), a set of eight open-ended
questions (Appendix 7) were generated, designed to elicit detailed responses about
how self-control of gambling was applied\(^5\).

\(^3\) Defined as cognitive and emotional processes combining to achieve planned behaviours that are intrinsically
motivated.

\(^4\) Four interviews were conducted prior to data collection in which the content, and language used in the interviews
was refined and reorganised. The interviews occurred at the University of Western Sydney during October, 1998 and
were conducted by the author in accordance with the procedures outlined for the 34 interviews undertaken and
compiled for data analysis.

\(^5\) There were 9 questions in total, the first question related to psychosocial development and did not refer to gambling.
Data Collection
The data for study 1 was collected from 34 in-depth, semistructured interviews undertaken at gambling venues. Criteria for inclusion in the study was meeting the target age range, 16 to 24 years\(^6\), and gambling once per week or more often, deemed ‘regular gambler’ (Productivity Commission, 1999).

The data from the 34 young gamblers (10 females and 24 males) was collected by two means. The main approach used a purposive (de Vaus, 1991) sampling technique in which youth who gambled once a week or more often were recruited from clubs and casinos. The second approach used a snowball sample, in which regular young gamblers were contacted via the personal networks of interviewers. In the former instance permission to interview on site was requested of three large gambling venues. Two of the venues, Star City Casino and Panthers World of Entertainment granted permission, and interviews were conducted at each venue at varying times of day and night (weekdays and weekends) during November 1998. Each interviewee received a $10 reimbursement for the costs incurred by their participation, which ranged in duration from 20 minutes to 1 hour and 45 minutes - totalling more than 70 hours of transcribed text with regular gamblers. Seven of the 34 interviews were conducted by the author, and the remainder by either a male interviewer aged 21 or a female interviewer aged 26. Two-tailed t-tests for significant differences in responses given to the three interviewers were conducted. T-tests revealed that reported number of Harms and extent of the monologue around Harms\(^7\) did not vary according to age or sex of the interviewer. Thus, interviewer bias was considered negligible. It should be noted that interviews with underaged gamblers did not occur at gambling venues.

Sample Composition
The sample composition is shown in Appendix 8. Seven participants were aged 18 or under, the majority were single and the male to female ratio was approximately 3:1. Seventy-nine percent had completed Year 11 or higher. Twenty-one percent were currently studying. Twenty-seven percent were unemployed and 41% were in

---

\(^6\) Age grouping aligns with delineations of “youth” as per the World Health Organisation, the Australian Bureau of Statistics and Australian Medical Association.

\(^7\) As measured by the number of text units recorded. (A text unit is a collection of sentences around a single topic)
full-time employment. The most common occupational grouping was sales/clerical, with occupations ranging from semiskilled through to professional. Incomes ranged from less than $116 per week to $1,154 per week, with a median income of between $289 to $384. Twenty-nine percent of respondents spoke a language other than English, including European, Middle Eastern, Asian and South American languages. The 34 youth interviewed came from 27 different suburbs across Sydney. Despite one third of interviews being conducted at a gaming venue in the CBD, interviewees resided overwhelmingly in western and southern areas of Sydney.

Analytical procedure

In the tradition of Grounded Theory the current study was true to the iterative process of empirically driven theory generation. Information was compiled into themes and subthemes. The data analysis was undertaken using the NonNumerical Unstructured Data Indexing Searching and Theorising System (NUD*IST version 4; Richards, L. & Richards, T. Qualitative Solutions & Research Pty Ltd), a software programme purposely built to facilitate qualitative analysis. The programme stores data in such a way that it is possible to generate ‘what if’ hypotheses and cross check responses to ensure a thorough and systematic rendering of the data. A very useful feature of the software programme is the capacity to export coded information to a word processor in the form of a matrix and also to a statistical package as a data file. The latter allows for quantitative statistics to be run on the data, providing tests of the concepts that underlie the qualitative data.

Writing qualitative studies

Qualitative studies are commonly not written in the prescribed format of quantitative studies. The typical introduction, method, results, and discussion format cannot accurately represent the integrated method. Because qualitative studies aim to be responsive to the data, they utilise instead the structure suggested by the evolving schedule of results. Such structure often does not emerge until the researcher has made a number of passes through the data, and consequently the final document presented here and in Chapter 6 has been the product of numerous iterations over a six month period. As Kemp (2001, p.1) noted “integrated analyses generate multiple, changeable hypotheses as the analysis is built up, deconstructed and rebuilt”.

76
Analytical Strategy

Step 1: Key characteristics that influenced self-control

To begin the analysis of the data as a whole, the transcripts of interviews were imported into NUD*IST 4 software programme. At Step 1 the analysis proceeded, with inductively derived concepts being used to challenge and reflect upon the data.

Development of key areas and risk groupings (see step 3 below for definition) was a parallel process. As one area emerged, it generated questions about the characteristics of each hypothesised risk group and these were raised in the subsequent stage. If a hypothesis was not supported it had to be refined and adjusted according to the data.

Investigation of the data ceased at a point where no new information was being gathered, that is, further analysis became redundant as it reinforced previously established concepts. Evolving new understandings were carried forward into the following stage of the analyses.

Step 2: Three stage process of control impairment

The analysis identified characteristics of self-control under each of the three key areas, limit setting, emotional responses and Harms experienced. These three key areas are presented as Stages 1, 2 and 3, the former in the present chapter and the latter two in Chapter 6 following. Together they form a model outlining the control process and identify developmental characteristics important to the control process.

Step 3: Group outcomes

Each of the three key stages was a milestone in formulating risk categories. Risk categories were derived by sorting behaviours into levels that supported or diminished self-control. Respondents categorised as having successful or unsuccessful control behaviours were reassessed at each subsequent stage. Where they exhibited high risk behaviour\(^8\) at subsequent stages they were retained in the

\(^8\) Defined initially by their failure to meet gambling limits initially and supported by their emotional orientation detailed in chapter 6.
grouping. Where they did not exhibit high risk behaviour at the subsequent stage, answers were sought for why they did not fit the subsequent high risk grouping and revision to their status was made on the basis of further investigation of their transcript. This test and retest phase continued for each respondent at each level of the analyses. Once the model was formulated, its structure could be said to be analogous to a 3X2 analysis of variance with two risk groupings and three conditions; control, emotions and harms.

At the final stage (stage 3, Chapter 6), the process of model development was supported by comparing the emergent risk groups with reported Harms. Reported Harms were coded based on the measures used by the Productivity Commission (1999). The distribution of the Harms were as would be expected of high and low risk gamblers in the general research literature, and as such provided cross-validation of the model building process, in which the assessment of harm was a secondary characteristic. The outcome of this process was a model with a set of empirically generated risk characteristics, and associated Harms, explaining how self-control of gambling was maintained or relinquished (Figure 2, page 79).
Figure 2: The Limit Maintenance Model
79
Step 4: Understanding findings as a function of self-regulation

Once the iterative process of analysis was complete and the model constructed, it remained to identify the areas of self-regulatory literature which provided the best explanations for the findings. The schema in Figure 1 is the Limit Maintenance Model which evolved from the data and details the five distinct characteristics of control and the process by which youth reach a successful or unsuccessful limit setting outcome.

Demographic data

Basedata (demographics) for each respondent were exported to SPSS (V10.3), and analysed for significant demographic differences in risk groupings. T-tests revealed only one significant difference in the demographic data. The significant difference was on Harms experienced by risk level and will be discussed in the Harms section, with due regard for the limitations of a small sample (N=34) on which to undertake statistical analyses. Although nonsignificant the ratio of males to females in the high risk group was almost double.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Low risk</th>
<th>High risk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Self-regulates limits</td>
<td>Externally-regulates limits</td>
</tr>
<tr>
<td></td>
<td>Successful Control</td>
<td>Impaired Control</td>
</tr>
<tr>
<td>Male</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>Female</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

Gender differences

There has been some debate in the literature during recent times (Ohtsuka, Bruton, DeLuca & Borg, 1997; Poulin, 2002) about disparity between the sexes on frequency of gambling and harmful outcomes. The present study, not reliant on positivist
psychometric instruments, and which gathered extensive empirical data on harms occurring from gambling, showed that contrary to the generally accepted findings, women (relative to group size) were more at risk and suffered more adverse consequences from gambling than men. The ratio of men scoring in the high risk group was lower than for women (Table 4, page 80). Fifty percent of women were assigned high risk status compared to 38% of men. It should be noted that all interviews were lengthy, and a number of males spoke in greater depth about their circumstances than did some women. Thus, the analysis and methodology in this study does not appear to be biased toward either gender. Secondly, it was made clear to respondents when consenting to an interview that it could be terminated at any time. Thus, all respondents participated freely and interviewers established rapport from the beginning, to enable a full and frank account of gambling behaviour to be collected.

Results from the limit setting analysis

Chapter 5 presents the first stage of the analysis in which the self-control process in gambling is explained. Beginning with thirty-four documents and 654 conceptual categories (nodes) three initial styles of limit setting behaviour were identified. These were:

No specific limits: a pre-defined limit was not imposed on gambling because prior experience and other priorities meant that it was not necessary. Target Limits: The majority of respondents commenced a session of gambling with a target limit in mind. A successful outcome was to stay within the specified limit for the session. For five respondents the target limit was revised just once. Contingency Limits: Continually revising limits and setting vague or broad limits was typical of respondents who spent all their available funds and were thus forced to end the gambling session. This type of limit was situationally determined and was deemed an unsuccessful outcome.

The reasons respondents gave for finishing a session of gambling fell into three categories. Six out of 34 respondents finished gambling when they reached a set monetary limit and claimed to rarely exceed that target limit. They reported leaving
the machine or the venue, to ensure no further gambling occurred. Three out of 34 respondents ceased gambling for nonmonetary reasons, such as boredom and having other things to do (NSL). For this group other events and activities took priority over gambling. A further 17 respondents ceased gambling in accordance with their target limits (TL), or after once revising their limits (SRL). Fourteen out of 34 respondents finished after exceeding their budget, or after they had lost as much as they could afford - commonly all of their available funds. This was deemed a contingency limit because although there may have been existing time and budgetary considerations, these respondents reported ignoring them and gambling until an external contingency, i.e. running out of money, forced them to stop.

**No Specific Limit Group (NSL)**

Three respondents finished their gambling session without having set any specific limit. These youth reported rarely spending more than they were comfortable with. Ceasing a session was not difficult because they reached a point where they preferred to be doing something other than gambling. They had no specific money limit in mind when they commenced gambling, and their past experiences were of leaving the venue before they needed to invoke a financial limit. Retrospectively, this group was clear about when (at what monetary figure) they would apply a limit, if need be. They played well below their financial means, and so gambling did not pose a threat to their sense of self-control. This group left the venue due to feeling bored with gambling, or when their friends left. They all left for reasons other than exceeding their budget or funds, and none experienced ambivalence between wanting to continue gambling and needing to stop.

Impaired control has been appraised in a range of ways (see Corless & Dickerson, 1989, p. 1527 for a summary). It is common for regular and problem gamblers to report spending all cash in hand, and more than planned, and more than they could afford. Despite the commonality of exceeding limits in gambling research, there are no studies that define the intended outlay nor the limit setting process, not to mention how the limit is exceeded. A further undocumented assumption is that gamblers at

---

9 One person in this group who did experience some ambivalence ceasing a session, Richard, mentioned that he got bored of his money ran out. Richard experienced conflict because his parents gave him money each week and he felt bad that he used it for gambling. His conflict was not about limits, but the source of his gambling money.
the high end of the problem gambler continuum are the ones who do not set limits – evidenced by large losses and severe consequences. The empirical data from this study showed that youth at the opposite extreme, those regular gamblers who reported no harmful impacts, were those who entered a venue without a predefined limit. In fact, setting limits at all, even if maintained, was associated with increased risk.

Inherent in limit setting behaviour, whether it arises from implicit knowledge or explicit prescriptive limits, is a set of standards or values which are abstract concepts of how things should be, and are used as a reference point when youth seek to control themselves (Tice et al., 2001). The strength of values and standards that people refer to when formulating goals give rise to the categorisation of their behaviour as either intrinsically or extrinsically motivated. It is commonly accepted that when control is consistent with internal values (Ward, Hudson & Keenan, 1998) it does not require the imposition of cognitive control and its attendant processes of defining limits, monitoring behaviour and evaluating outcomes. The values of respondents in the NSL and TL groups safe-guarded against large investments of time or money in gambling, and consequently they controlled gambling successfully and relatively effortlessly.

The NSL group experienced no ambivalence about gambling behaviour. The apparent absence of goals within the NSL group did not mean they were functioning without direction from goals or without monitoring their gambling, but simply refers to an absence of processing at a conscious cognitive level and is thus a process of dynamic self-regulation (Pintrich, 2000). Dynamic self-regulation is said to occur outside the spotlight of active attention, to operate spontaneously and flexibly across many domains, and involve tacit and implicit knowledge as well as intuitive self-awareness. Under these circumstances a limit may not be actively pre-determined, but may be recognised once it has been reached (Pintrich, 2000).

Grolnick & Ryan, (1989) state that the most pertinent aspect of self-regulation is the degree to which behaviours are externally initiated and controlled versus self-initiated and managed. In their view self-regulation occurs on a continuum from less to more
autonomy\textsuperscript{10} (Grolnick & Ryan, 1987; Ryan, Connell & Deci, 1985), depending on the extent of the individual's own impetus in eliciting and maintaining behaviours (Deci & Ryan, 1987; Nix, Ryan, Manly & Deci, 1999).

Behaviour that is motivated or enforced by others is experienced as being caused by external forces, and therefore has the potential to undermine true autonomy (Grolnick & Ryan, 1987). The NSL group showed no signs of relying on external regulation to control their gambling activities. Intrinsically motivated behaviour is consistent with autonomy. When people experience their behaviour as autonomous it leads to a more positive experience (Grolnick & Ryan, 1987) as the NSL group reported. Autonomous behaviours are those that are phenomenally experienced as flowing from and expressing one's self, whereas controlled actions are experienced as demands to behave in specified ways. The NSL group successfully executed a self-chosen behaviour, demonstrating autonomy and self-control. The data suggests that youth in the NSL group would also have more confidence in their ability to function autonomously in other areas of their lives.

Frederick and Ryan's (1995) examination of how variations in autonomy versus externally controlled behaviour differentially influenced the positive affects of happiness and vitality is particularly relevant to young gamblers. For some, gambling is an addictive-like behaviour that can be a source of suffering and unhappiness. Some evidence is available to show that approaching an activity as an autonomous or truly self-regulated activity can help maintain subjective vitality, relative to engaging in a more controlled activity (Ryan, 1993). In the NSL group where self-regulation of gambling was optimal, there was also an absence of the negative emotional states evident in other gamblers in the sample. This finding concurs with Frederick and Ryan (1995) who argue that the positive affect of happiness can result from attaining a goal or getting what one wants. Frederick and Ryan's (1995) research supports the restorative and vitalizing potential of self-regulated action, relative to the potential for drained or diminished vitality when one's activity is controlled by external contingencies. The present data lends itself to the view that to the extent to which self-regulation of gambling activities is autonomous, it protects against dysphoric mood because a goal is achieved and outcomes accord with

\textsuperscript{10} The developmental principles and behaviours that foster self-regulation.
values. The NSL group provided clear evidence that gambling activities were managed autonomously, with the impetus to limit the activity arising from intrinsically motivated values. Under these conditions successful control was consistently applied, resulting in confidence in their control self-efficacy.\textsuperscript{11} It will be demonstrated in later stages that these characteristics of control were contrary to experiencing harmful impacts, and an important path to ensuring gambling was contained at a sustainable level.

**Target Limit Group**

Thirty-one respondents commenced a gambling session with a monetary limit in mind. Because these 31 respondents (representing 91% of the sample) did specify a monetary limit to their gambling, their behaviours can be specified in a step-by-step goal oriented process. Goal setting is a component of many broader psychological theories, where for example, decision-making theories and organisational theories commonly outline a desirable course of action and map the steps to get there. Goal setting and its component partner, self-monitoring are well-researched, interdependent, self-regulation strategies (Kitsantas, 2000).

Within the field of addictions, self-control models posit that addiction is based on maladaptive habits and assumes that an individual can learn to change and is therefore capable of self-responsibility for their behaviour. It follows that behaviours can be altered based on goal setting and its component features, monitoring and self-evaluation. Intentional planned efforts that utilise these skills have generally been found to increase goal attainment (Marlatt & Parks, 1982). In this way strengthening an individual’s self-regulation skill can generate self-perpetuating cycles of improvement in control. The extent to which such intentional processes impact on gambling behaviour is a researchable question with the potential to deliver new insights and advance the existing knowledge in the area.

Three main paths branch from the starting point of set limits in the model. These will be discussed in order: those who met target limits (TL) including those who achieved

\textsuperscript{11} This term is defined on page 115. It utilises the concept of self-efficacy defined by Bandura (1977, 1982) specifically to qualify a youth’s sense of efficacy in self-control of gambling.
a single revision of their limit (SRL), those who constantly revised target limits (RL), and those who held broad limits (BL).

The twelve respondents who met their target limits, monitored their gambling activity. They were aware of the amount of money they had spent and the amount remaining before they would end the gambling session. Part of the in-session monitoring process involved splitting funds between alcoholic drinks, for example, and gambling. In doing so each person referred to a standard that motivated them to meet their target limit. As an example of pre-session monitoring, Angela noted emphatically:

“... we pay the bills and if we have got a little bit left over we come and play. But if we don't have it we don't come. We get everything out of the way first and if we have got a bit we spend it. If not we don't.”

In Angela’s case the standard adopted was based on feeling uncomfortable if she owed money. Standards are concepts, often abstract, of how things should be, and when people seek to control themselves, they invoke their personal standards (Tice et al., 2001). Angela was aware of her discomfort with owing money and continued to monitor her gambling activity to prevent her discomfort escalating. The key component of the successful limit setting behaviour, which encouraged the monitoring of standards was self-awareness (Baumeister et al., 1994; Kirschbaum, 1987) of the consequences of failing to control gambling. One common way that failing to regulate behaviour occurs is because a person stops monitoring the discrepancy between their standards and their behaviour (Baumeister, et al., 1994; Kirschbaum, 1987). The TL group demonstrated their awareness of the consequences of gambling and what it would mean to exceed their limits, thereby actively monitoring by comparing their standards with the outcomes of their gambling activity.

Invoking standards to meet target limits was consistent with the capacity to articulate the consequences of exceeding financial limits. In this group of 12 respondents, knowledge of the consequences of exceeding limits was not distorted by emotionally focussed responses throughout the interviews. For example, respondents viewed a lapse within the context of their circumstances and psychological state, rather than
as an indicator of their inability to apply limits. This suggested that successfully invoking standards, monitoring and maintaining self-imposed limits was related to a relative absence of emotional reactivity. It should be noted that these self-imposed limits were maintained, via goal setting and monitoring, even though respondents were enjoying the gambling activity and may have preferred to continue to gamble even when the limit was reached.

When successful monitoring is occurring, there is also an accompanying evaluative process occurring (Ward et al., 1998). Self-evaluation refers to the appraisal of one’s performance, both progress and outcomes, according to a standard (Kanfer, cited in Kistsantas, 2000). The important issues in the evaluative process is whether the evaluations between cognitions and events are favourable. Generally, this group of 12 experienced little or no discrepancy between their desired limits and their actual behaviour. Thus, self-appraisal of the ability to control gambling was very favourable due to consistently successful limit setting outcomes.

In contrast to the process of the dynamic self-regulation (Pintrich, 2000) experienced by the NSL group, self-regulation within the TL group occurred through active attention and conscious self-awareness. Under these conditions a limit was actively pre-determined and reached with no attachment to continuing the activity. In Orford’s (2001) conceptualisation of the attachment mechanism that impairs control of appetitive behaviours a problem gambler finds their resolve to maintain a limit weakened because the immediate rewards (or potential rewards) achieved by gambling outweigh the considerable, harmful but distal consequences experienced. By this definition, this group of 12 evidenced no excessive attachment to gambling, but rather displayed a realistic understanding of the unlikelihood of achieving rewards (i.e. wealth or status) through the activity.

Within the target limits group there was a consistent lack of strong attachment (Orford, 2001) to gambling, little or no ambivalence about ceasing a session of gambling and an absence of emotionally toned comments about gambling. From the viewpoint of a self-control model, the difference between the activities of these gamblers and problem gamblers can be understood as being due to the core self-regulatory functions of limit setting, monitoring and evaluation. These self-regulatory
functions were protective and adaptive factors for the 12 TL group members who were maintaining a sustainable level of gambling.

**Use of Current Cash Only**

For a variety of reasons, people have impulses or preferences for certain types of behaviour, e.g. as a result of learning, innate tendencies, inclination, or habit. These preferences may be in conflict with internal values or goals, even though it may not be apparent to the individual initially. In the TL group there were four respondents who were aware of a conflict between wanting to gamble but not wanting to spend all their money. Consequently, the four employed a strategy to ensure that the conflict between their desires did not weaken their resolve to spend only the target limit. To ensure they ceased gambling at the target limit, they intentionally carried no more cash than they wished to spend, and therefore were not concerned about over spending during the gambling session. The decision regarding how much money to spend was made prior to arriving at the venue and was self-enforced by “current cash only” behaviour.

**Single Revised Limit Group (SRL)**

In all, thirty-one respondents commenced their gambling session with a pre-set monetary limit. Twelve of these respondents exceeded the pre-set limit and consequently revised or reset the limit to enable them to play longer. Of the 12 that revised their limits, five met their second limit, i.e. ceased play when the second limit was reached. Seven respondents continually revised and reset their limits as they were exceeded. Those that met their revised limit (SRL group) epitomised the multiple levels of goals identified by goal based theorists de Haas, Algera, and van Tuijl, (2000), McGrath and Adams (1999), Reif, (1998) and Vancouver and Putka, (2000). Carver and Scheier (1982) for example, distinguished between conceptual and perceptual goals, in which the latter equates to a goal that fits with one’s view of the ideal self and is thus seriously attempted. Although revising and resetting a limit suggests a temporary disinhibition from the perceptual goal, respondents seriously attempted, and achieved their goal. They were unconcerned about exceeding their original limit, reporting that although they may do so sometimes, their goals were supported by behaviour and thus the experience was of finishing a gambling session, on budget, as planned.
Jocelyn said:

"Like I set limits of course, I don't want to go crazy and spend two hundred dollars here [at the casino]. I'd rather spend two hundred dollars going shopping (laughs). I'll spend about fifty bucks but that's about it."

Jocelyn's comment indicates that she sees herself as a person who will spend money on goods that she wants, but would be unlikely to spend much more than $50 on gambling as she views it as crazy [not a rational use of money].

Similarly Jarred's comment indicates an understanding that a limit may be exceeded but the conceptual limit of staying ahead or even is the limit he remains faithful to:

".... [I] have a limit. When you've gone past that get out and go. Quit while you are ahead, well not ahead but while you are sort of even."

Whilst a lapse in goals suggests a temporary disinhibition, behaviour remained relatively consistent with the perceptual goal. Thus, those who had a target limit (TL) were unconcerned about exceeding their original limit and reported that although they did so sometimes, most sessions finished as planned, on budget.

**Awareness of money issues**

Integral to the goal operating for the five who revised and then met their target limits (SRL group) was an understanding of financial planning. Each had a pragmatic approach to the value of the money being absorbed by gambling. Steve, for example, acknowledged the effort needed to earn the money he had spent:

"After losing I'd say, about a hundred or two hundred dollars, you start thinking, I've lost a lot of money, it's nearly like a weeks wages. I just stop basically, just thinking it's a lot of money. Afterwards, it's really hard to get that back".

On the day of his interview, Steve had exceeded his target limit by $200 before stopping, and realised that it amounted to a lot of money. People can only regulate
themselves successfully if they pay attention to what they are doing or have some other way of acquiring knowledge (Tice et al., 2001). It is necessary, as Steve demonstrated, to recognize that one is behaving in a manner that is inconsistent with one’s standards and goals. Steve’s deliberate attention to his gambling behaviour (even retrospectively) enabled him to make judgements about whether or not he was maintaining his standards and moving closer or further from his goals. During this essential process of checking progress (Schutz & Davis, 2000) his feedback to himself conveys the sense that while he has gone over his budget, by likening the amount to the work effort needed to earn it, he maintained a perspective that allowed him to apply control. The significant aspect of his comment comes in the final sentence when he experienced a realisation of how hard it would be to recoup the lost money.

The comments made by these five youth consistently showed an understanding that earning money required time and effort, and to spend it without thought for it’s value, was to have wasted their time and effort. Accordingly, exceeding a target limit was an occasional event for this group. These five youth experienced little or no ambivalence about ceasing a session (even after exceeding their initial budget/funds). One further shared quality was evident in the way each expressed themselves: They did not use emotionally toned expressions when they discussed how they ceased gambling – a theme taken up in Chapter 6.

**Choice/Control**

The point in the model at which target limits are revised is pivotal to the ultimate success or failure of the limit setting process. The revision of the limit can be viewed as a choice point and there are multiple themes that can partially account for the lapse and realignment that occurs in revising limits.

The Scale of Gambling Choices (SGC; Baron et al., 1995) shares with self-regulatory theories (e.g. Diaz & Fruhoff, 1991) the founding premise that the user has some element of choice in their behaviour. Motivations and intentions within a particular

---

1. Realigning behaviour with intrinsically held concepts can also be equated with the homeostatic process of moving back into equilibrium (Diaz & Fruhoff, 1991).

2. We know from Steve’s comments that he was trying to save money whilst working and studying.
context generate behavioural choices about self-control and affect the quality of that control, which may be either adequate or impaired. Thus control is not beyond the individual’s capacity, as early loss of control and craving theories propounded (Baron et al., 1995), but varies along a continuum of control. The RL group chose to allow a deviation from the intended limit once, and then reinstated behaviour that aligned with the limit. This demonstration of flexible behaviour is one of the key indicators of truly autonomous functioning (Kuhl, 1992). Revising the limit once to fit with a desire to continue enjoying oneself is an example of flexibly balancing commitment to and disengagement from intention, which lies at the heart of self-regulation (Klinger, 1992).

At a general level goals may also be revised because interests continually change and the standards against which behaviour is evaluated change. Shifts in standards may be reflected in flexible control processes, as demonstrated by the RL group, which allow for fluctuations in behavioural goals. In such circumstances, and where there is no radical departure from standards and goals, this is indicative of adaptive and autonomous self-regulation (Heatherton & Baumeister, 1996).

In summary 15 respondents (NSL and TL groups) finished a gambling session without the desire to continue gambling. Five respondents revised their limit once (SRL group) and then ceased play and 14 respondents (RL and BL groups) ceased a session not resolved to the outcome – that is to say they felt the desire to continue gambling.

Revised Limit Group (RL)

Continually revises limit
Revising a target limit was a crucial turning point in the Limit Maintenance Model. Proceeding to multiple revisions of a target goal led, without exception, to unsuccessful limit setting outcomes in which cessation was eventually forced upon the individual by exhausting all available funds.

These findings concur with those from a Canadian study (Schellinck & Schrans, 1998) of video lottery terminal players in which from a list of seven reasons, exceeding budget and spending all available cash were the most common reasons
cited for ceasing a gambling session. Interestingly, exceeding budget (63% of sample) and spending all available cash (65% of sample) were common reasons why problem players stopped a session, and the same reasons were also significantly more often cited by regular players.

In the present study the 14 high risk respondents\(^{14}\), ceased a session because of exceeding their budget and/or spending all available cash. The end of the session was therefore brought about by an external contingency, rather than self-control and its underlying processes.

Joseph provides an example of the experiences of how these BL and TL respondents commonly ceased a gambling session:

> "When I am on my own the initial way would be to lose the money because then you've got no choice. That's it you're just like, shit, there goes the money. Shit, I'm going home."

As with Joseph, Tanya's account illustrates that the session ceased only when an external contingency (money) prevented it from continuing.

> "... I leave the pokie, when I run out of money. Basically I could sit there and like I may have twenty or thirty dollars in me pocket and I walk up there and say I will only put five in. And I won't walk away until the twenty or thirty is gone."

For this group reaching a contingency limit was associated with ambivalence about ceasing a session, as all reported that they wanted to continue gambling even when they had run out of money. Their ambivalence about ceasing a session was evidence of their conflicting motives for gambling, which in turn generated goal confusion and a breakdown in the self-regulation process.

Seven of the fourteen high risk respondents specified an approximate amount of money allocated to their gambling session. When a specified target limit existed, it

\(^{14}\) Defined by their failure to meet gambling limits initially. Also supported by emotional orientation detailed in chapter 6 and confirmed by reported harms also detailed in Chapter 6.
was commonly extended a number of times, with the gambler passing through each revised limit before ultimately exhausting all available funds.

For example, Macca said:

“*I do have a limit, like if I go to the pub with like seventy bucks I think okay, twenty bucks that is it. When I had the fifty dollars [remaining], the fifty dollar mark, most often than not I will think oh f… it, I will put in five dollars more, what the hell. It still leaves me forty-five. But once I do that I know I will go to forty then thirty-five, yeah thirty… But I do try to stick to the limit that I have set myself, I try to but it doesn’t always happen.”*

One way to understand the limit revision process is to view it as the pivot point at which a number of goals converge. An individual with the goal of spending only $50 per session may have a conflicting goal of wanting to save money, for example, and is thus constrained between the belief that further gambling will deplete their finances, and the belief that they may win.

Each of the respondents who continually revised their goals told interviewers they would have liked to continue gambling even though they knew they should not, and even though they had run out of money. The ambivalence experienced about ceasing a session demonstrated the existence of a number of conflicting goals.

Goals exist at multiple levels and some goals take priority over others. When multiple goals exist, self-regulation necessitates that the individual make a decision between goals that serve short term purposes, such as satisfying an immediate desire to purchase an extravagant item and long-term goals, such as saving for a deposit to buy a house (Tice et al., 2001). The self-regulation process requires that the individual contrast their natural response, commonly serving a short-term goal, with another response, commonly serving a longer-term goal. Through contrasting the two options a suitable alternative may be reached.
It has been consistently argued that most self-control failures are characterized by the desire for short-term gains despite long-term costs. (Baumeister, 1997; Baumeister, Heatherton & Tice, 1994; Mischel, 1974; Mischel, Canter, & Feldman, 1996). Respondents outlined their long-term goals during interviews and each of the high risk group said that gambling jeopardised their goals. For example, Stephen outlined the ways in which gambling disadvantaged him financially and personally:

“\textit{I think it [jeopardises my goals] because I want to move, go, just move up in my life to a higher level and I know that gambling is always so appealing, ... it's always going to be bringing me down and keeping me on the same low level. Financially of course it will stop me, but also it will keep me mentally weak because I won't be able to control the bad habit and [will] really lack discipline.”}

Thus the point at which target limits are revised places the person in a high risk situation with respect to maintaining existing long term goals (e.g. saving money, building self-esteem), versus attempting to achieve short term goals such as winning money or continuing an emotionally satisfying experience. The convergence of conflicting goals produced ambivalence attributable in part to deficient standards\textsuperscript{15} (Endler & Kocovski, 2000). Such was the case when wanting to win money was based on more fundamental goals of social status\textsuperscript{16}, or escape from aversive emotional stimuli.

Holding conflicting goals (Baumeister et al., 1994; Karoly, 1993) results in confusion and creates difficulty in the monitoring phase of self-regulation. This occurs because conflicting goals generate a lack of clarity and uncertainty about which behaviour to monitor (Baumeister et al., 1994; Kirschenbaum, 1987). At some point in the process the person shifts their self-awareness away from the immediate target goal (e.g. limiting) and engages in activities that are incompatible with their longer-term goals (e.g. saving). The conflict between the immediate desire to continue gambling and the consequences for long-term goals creates a conflict which, at this stage of the Limit Maintenance Model, can be represented simply as the difference between

\textsuperscript{15} Accepting gambling as a means of making money is problematic in itself.

\textsuperscript{16} For example, wanting to be seen as a winner
losing money and gaining it. Consequently, when gambling until all funds were expended, both a short-term limit and a long-term lifestyle goal were compromised.

Contemporary models of self-regulation argue that control becomes more difficult when cognitive processes must be allocated to over-ride the desire for the addictive behaviour (Kanfer & Ackerman 1989). When the addictive behaviour is integrated into a multi-layered goal structure, marshalling self-control resources is said to be effortful because it relies on a number of component processes which, if not occurring automatically (without attendant thought), must be established, activated and monitored. Such effortful behavioural management may be undermined by stress, negative mood, fatigue, physiological pressures, or social pressure, to the extent that it becomes difficult for a person to maintain clarity around standards and behaviours. Added to these factors are the environmental considerations in which the monitoring occurs. Elements such as noise, speed of play (Boyer & Dickerson, 2003) and machine characteristics (Griffiths, 1999) further increase the cognitive effort required for behavioural management. In this study, it is such circumstances which have resulted in under-regulation (Ward, et al., 1998) in which goal setting behaviour was abandoned or unsuccessful.

In contrast to all the youth gamblers who set any kind of limit, those without specific limits (NSL) monitored their gambling activities (evidenced by their observations of and reflections about their gambling) but had no need to apply a precise limit setting process. Sustainable levels of gambling did not require effortful cognitive processing, rather it was derived from a core value that was incompatible with some aspect of gambling (financial, social, intellectual, etc). Similarly, for those who met their targets (TL) attempts to maintain the goal had primacy, because the nature of the goal was effortlessly derived from an intrinsic standard.

For respondents with higher levels of risk associated with their gambling (BL and RL groups), the confusion caused by conflicting goals resulted in unclear goals and difficulty in monitoring behaviour. The shift in awareness that arose when a respondent was no longer able to attend to a priority goal, meant that behaviour was no longer being monitored or evaluated. Such loss of awareness, or disinhibition (Ward, et al., 1998) holds the potential for splurges, or (to use the terminology of
substance abuse literature), binges. Evidence for this type of failure can be found throughout the eating disorders literature. For example, in a study by Schupak-Neuberg and Nemeroff (1993), compared to controls, bulimics were found to have greater confusion regarding their sense of self and according to this study, were not monitoring and appraising their behavior during a binge. The conclusion was that during the process of binging, they were unaware of the discrepancy between their goal (presumably healthy eating habits) and their behavior (i.e., binging). Further examples from the weight reduction literature show that individuals who self-monitored had more successful weight loss outcomes than individuals who did not (Bellack, Rozenksy, & Schwartz, 1974). In follow-up studies, self-monitoring was found to be essential for continued weight loss (Perri et al., 2001; Perri & Corsica, 2002). At the point in the Limit Maintenance Model (Figure 2, page 79) where repeated revision of target limits occurs, self-awareness of the target limit had waned. Thus, ceasing to monitor behaviour is implicated in impaired control of gambling, as it is in other addictive behaviors.

To understand how the goal directed behaviour comes to be abandoned, it has been documented that there may be two stages of failure of self-control: an initial, small lapse\textsuperscript{17} and a subsequent full-blown splurge, referred to as a lapse-activated failure (Baumeister et al. 1994). The initial small lapse can provoke a snowball effect (also termed the "what the hell" effect; Polivy & Herman, 1985), such that a dieter, for example, who ate one cookie may experience a feeling of "what the hell, I've already broken the diet for today" and respond by finishing the entire plate of cookies (Tice et al., 2001).

\textbf{Control Efficacy}

The cumulative effect of continually revising limits is that the individual comes to have little faith in their ability to stick to their limits. Self-efficacy is the belief that one is capable of carrying out a desired behaviour (Bandura, 1986; 1997), and therefore an individual's repeated revision of limits results in diminished control self-efficacy. As with any failure, the experience of gambling without a sense of behavioural control is

\textsuperscript{17} Theoretically this suggests that the respondents who successfully revised their limits once may be at risk of progressing to further revisions. This was contrary to the finding that one successful revision demonstrated flexibility in control, a marker of true autonomy. This could only be confirmed by tracking the same group of people across time.

96
construed negatively by the gambler. Respondents who passed through the continual revision phase were aware that they would be unlikely to stick to their limits. Because the perceived ability to attain goals is an important factor in the first step of defining the goal (Endler & Kocovski, 2000), the experience of repeatedly failing to stick to a limit had a cumulative effect for respondents in this group. Control self-efficacy over gambling was eroded in proportion with the duration and magnitude of repeated failures. In instances where addictive behaviours are used as a means of self-prescribed regulation (Khantzian & Mack, 1989) to reduce negative affect, for example, the individuals become reliant on the addictive behaviour and underestimate their own ability to restore equilibrium. The continued reliance on the addictive behaviour erodes confidence in their ability to abstain from it, and creates a dependency that makes the process of change complicated (Marlatt, Baer, & Quigley, 1995). Raising an individual’s belief in their sense of control self-efficacy may impact on their behaviour (Bandura, 1997). In the eating disorder literature, the greater a subject’s belief in their ability to effectively regulate behaviour, the less bulimic participants engaged in purging behaviours (Schneider, O’Leary, & Agras, 1987).

Consider Tony, who claimed to have ‘recovered’ from a gambling problem discussing how his failure to control gambling is foremost in his mind when he goes to a venue:

“I still get a bit scared because I do have money now and I get scared that one day I am just going to click. Or one day I am just going to sit on a machine you know and win six hundred and fifty bucks and forget to go home and just keep playing and playing and playing and it is all just going to start again.

And further:

“Especially because when you have got money in your wallet you just want to, you walk in and you just keep thinking that’s it, I am going to throw it all in. You’ve got no control. Sometimes you walk in and you know you are going to lose, just feel oh God! What am I doing? There have been many times I have wished somebody would just kick me out, just not let me in.”
Joseph’s experiences with control failure have resulted in negative emotions which he recognises are harming him:

“It’s sort of a constant occurrence so to speak, because like you do feel, you just feel so guilty, ...., what you are actually doing is robbing yourself of all the good things, plus f...ing rubbing your self esteem right into the f...ing ground, basically you know.”

The relationship between behavioural strategies and emotional states is very important. The failure to achieve important goals is likely to lead to negative emotions and an attempt to rectify the situation. Empirical research in gambling needs to determine if individuals are in fact monitoring or evaluating their behaviours. If monitoring is occurring, are evaluations between cognitions and events favourable or does the individual conclude that they are unable to minimize the discrepancies between their desired goals and their actual behaviours? And does this lead to abandoning goals? For example it may be the case that a person who expects gambling to satisfy their financial needs, upon discovering that it doesn’t, turns to an alternative means of obtaining money such as crime or prostitution because no conventional pathway towards a stable income seems possible.

Julie demonstrated the same spiral of revised limits. Although she had an awareness of alternative uses for her money, she exceeded her revised limits more than she met them:

You sit there and especially when you go sort of above whatever your limit is, like. Like I sit there and I think that forty dollars that is my phone bill, like what am I doing? Or that is my groceries for a week or whatever. I do that all the time when I spend more than my imaginary limit. All the time, every single time I do it I think I could have done something else with that money. Every single time. [Spoken most emphatically]"
Julie equated the money lost to everyday living expenses, but she also referred to her imaginary limit, suggesting that she had no confidence of sticking to the limit she set; it was in her words, a figment of her imagination, or wishful thinking.

**Exceeding Target Limits**

Referring to Figure 2 (page 79), the following discussion concerns respondents who set limits and progressed through the revised limits pathway (RL group). Discussion centres firstly on the revision process and secondly on imaginary limits (n=4 of 7) that were conceptual rather than perceptual (Carver & Scheier, 1982). That is to say, the imaginary limit did not align with the person’s own perception of their capabilities and was thus not seriously attempted.

Hypothetically, revising and exceeding limits may be the means by which gamblers cease to consciously define limits. Ceasing to define a limit implies a gradual slide from attempting to meet limits into a limit-less state. Repeatedly failing to meet a limit erodes control self-efficacy which is reflected in the individual being disinclined to establish limits. It may be that goals were set at levels that were too high or at levels that the individual could not sustain, but what is very clear is that the RL group did not believe they were capable of achieving the limit. Recognising this hurdle, respondents disengaged from any attempt to meet the goal, particularly when positive behaviours and cognitions did not receive reinforcement (Endler & Kocovski, 2000). For example, Macca said:

“*My parents always say, like okay, you are no good at this and you are no good at that. They never say what I am good at you know what I mean? I don’t really expect a whole bunch of like, oh yeah Macca you are so good at this you should do this, sort of thing, but like a bit of constructive criticism every now and then would be nice, you know what I mean?”*

Some respondents were so despondent about circumstances in their lives, that adopting and sticking to gambling limits was not viewed as likely to have any useful impact on their lifestyle. Underlying the repeated failures was a hopelessness that
doomed any serious attempt to set and achieve limits. Thus limit setting was a belittling process that they avoided.

**Broad Limits Group (BL)**

**Avoiding specifying Limits**

One possible adaptive outcome of broad limits is that it overcomes the cycle of revising and failing at limits. In avoiding this explicit failure, seven respondents were also able to reduce the negative impact on their control self-efficacy. They were taking a risk on winning, using chance determined gambling in which the statistical edge was against them. This was a short term protection and illusory, a phenomenon that has been well documented in studies of illusory thinking styles (Walker, 1992a, 1992b)

Sixty-three percent of all respondents were motivated to gamble by the chance of winning. Each of the seven high risk respondents in the BL group avoided specifying limits to their gambling. Each was evasive or vague about their intended limits and spoke in the manner of entrepreneurs engaged in a business deal. In contrast to the RL group who unsuccessfully revised their limits and/or specified limits without any real hope of applying them, the BL group held high (relative to the rest of the sample) limits with a broad margin between the specified range, for example between $200 and $500.

The seven young men in the BL group (there were no young women) had strategies for winning and saw themselves as achieving their goals to some extent. They viewed the life of a professional gambler as a legitimate way to make a living, despite the fact that the rest of society simply does not agree. Consequently, they did not view their own lifestyle as particularly problematic (prior to the escalation of harms). Whilst their goal setting and planning strategies may have been impeccable, the difficulty resided in the initial goals and associated values and beliefs. The reference values or goals around which their behaviour was regulated were false serving or distorted in some way. For example, Aaron spoke at length about what he would like to achieve in his life. His quote is lengthy, but necessarily, as it epitomises the impatience for money, and frustration with working for a living, that each of these young men demonstrated.
"Basically I would like to run a business, make a lot of money, travel. And just live! Not get up in the morning and have to do a nine to five job ... yeah without having to slave for it. Put it this way, I don’t want to retire when I am sixty and get my super and live with my wife or anything and get my four hundred dollars a week and whatever and own my house and just live until I die. ... What is the point of that? ... Some ninety percent of people are happy in this life to do that. Plod along their whole lives and retire and work until they are sixty or sixty five now and what is the point? You might as well take the risk in your life and if it doesn’t work out you will become one of them."

The fundamental problem resides in the choice of goals, and/or the means of obtaining the goals rather than in a breakdown in the components of self-regulation. The emotional state associated with this type of problematic self-regulation is potentially positive; the person is striving to achieve their goals and does not regard their lifestyle as particularly problematic. Distress eventually results from the continued attempt to attain a goal that is unattainable, with the exception of very few cases. The perception that goals are not currently being met leads to subsequent attempts to rectify the situation (Ward, et al., 1998) by trying harder and consequently respondents failed to disengage when the goal was unattainable (Carver & Scheier, 1999).

The BL group reflects appetitive processes rather than inhibitory ones (Ward et al., 1998). They provided evidence of the transition from imposing cessation limits, to respecifying limits in terms of winnings. When asked about the end-point to his gambling sessions, Jason (a gaming machine and table games player) said:

“Well it depends on what sort of money you have, sometimes I go and gamble with a particular figure I’ve got in mind, how much you want to win and then you don’t stop until you win that much”.

Tony (a gaming machine only player) also described his limits in terms of winning:
“Everyone has I guess, an x amount of dollars [that they are satisfied with winning] .... Some people are not satisfied with winning ten thousand dollars. I am one of the guys who doesn’t pull out at two hundred, three hundred dollars. I’ll keep playing. If I get around a thousand, seven, eight hundred dollar mark I do pull out”

When respondents gambled with a goal of winning a specified amount of money before ceasing, they no longer monitored expendable income limits; to do so was a strategy which ended in failure. Rather, limits were reconstrued as minimum amounts to be won. Not meeting their desired winnings limit resulted in applying more effort to instigate a cleverer, more effective strategy. In self-regulation terms their behaviour moved from being disinhibitory, a perspective that assumes that the goals influencing these behaviours aim to decrease or inhibit a behaviour, to being acquisitional, whereby the goal was to gain, increase or sustain some material goods and possibly level of arousal (Ward et al., 1998).

The appetitive processes involved in winning were not just about gaining money. These youth liked the recognition that went with being seen by friends to be a winner. For example Macca talked about the reputation enhancement of having a win witnessed:

“... so that if I get a big win then I can turn around to whoever and go oh yeah! or you know like look happy and have someone to pay out the money to me [grinning] and I will just sit there with a big smile going yeah!”

Macca’s perception of doing better than others may be as important to his persistence at gambling as is winning money (Levitz, 1971). Generally, these youth wanted to be seen as winners and when ability or life circumstances handicapped them in education or employment, gambling was an activity where they perceived they had just as much chance to succeed as their peers, perhaps even more. An appropriate way to understand the appetitive process occurring is by considering introjection (Ryan, Connell & Grolnick, 1992). Introjection is a regulatory process that is experienced as a pressure or demand within the person. A classic form of introjection is ego-involvement in which a person performs an activity because of a
pressure to maintain self-esteem, or in order to prove their intelligence (Nicholls, 1984; Deci & Ryan, 1983). According to self-determination theory, ego-involvement or introjection is a controlled form of behaving and as such is not consistent with truly autonomous, intrinsically motivated behaviour. Setting out to gamble with the goal of winning money or enhancing reputation is antithetical to maintaining control via a specified money limit.

**Summary of findings from Stage 1**

The model building process throughout the thesis relied on conceptually grouping respondents into categories derived from the characteristics of their gambling behaviour. Table 5 (below) summarises the characteristics, and groups them into high and low risk behaviours.

**Table 5:  Key Limit Setting Characteristics of High and Low Risk, as generated throughout the Model Building Process**

<table>
<thead>
<tr>
<th>Low risk (NSL, TL, and SRL Groups)</th>
<th>High risk (BL and TL Groups)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experienced no ambivalence about ceasing gambling</td>
<td>States limits, but exceeded them more often than not.</td>
</tr>
<tr>
<td>Ceased gambling before losing all available money</td>
<td>Regularly forced to cease gambling by exceeding available funds.</td>
</tr>
<tr>
<td>Articulated limits; were pragmatic about the value of money</td>
<td>Vague or unspecified limits</td>
</tr>
<tr>
<td>Occasionally exceeded budget; unconcerned as mostly met limits</td>
<td>Reframed to a 'win' limit</td>
</tr>
<tr>
<td></td>
<td>Experienced ambivalence about ceasing a session. Would like to have continued.</td>
</tr>
<tr>
<td></td>
<td>Felt concern about exceeding limits</td>
</tr>
</tbody>
</table>
Twenty-four of the 34 respondents were deemed to have low risk gambling
behaviours because they either applied successful self-control by limit setting, or had
no difficulty with control (NSL group). Accompanying their successful self-control of
limits was an absence of ambivalence about ceasing a session and clear articulation
about the consequences of exceeding those limits. Ten respondents exhibited high
risk gambling behaviours because they were unable to adhere to a limit and were
regularly forced to cease gambling by running out of money. Even then they would
have preferred to keep gambling. The characteristics of each group were distinct,
given the rigorous process of analysis in which coding categories were continually
tested and reconstructed until such time as the model became saturated (i.e. all data
was accounted for by the analysis and no data could provide information contrary to
the coding schema).

In this study, with the important exception of the NSL group, control was gauged by
whether limits were set and maintained. Self-regulation processes were identified as
they contributed to the management of limit setting. For the 20 low risk respondents
the presence of limits or goals, even if these limits were waived once, was associated
with successful gambling control. Those who specified target limits were clear about
their limit and spoke about the reasons why the limit applied. Their choice to stop
gambling was guided by an intuitive awareness, and a set of goals or values that
were not consistent with using more money than intended for gambling.

This sample of gamblers did monitor and evaluate their gambling behaviours. Those
who set and kept limits did so in the context of personal goals, and how compatible
these goals were with gambling. Those whose limits were externally driven, i.e.
ceased gambling only because of exceeding financial resources, were a) more
preoccupied with maintaining limits, and b) less aware of the process of limiting and
c) less aware of the cumulative effects of failing to limit gambling. Notably the NSL
group who did not utilise conscious cognitive resources to invoke limits. These
respondents had other priorities in life which safeguarded them from the likelihood of
excessive involvement with gambling. The importance of activities that were
inconsistent with time and money expenditure in gambling demonstrated intrinsic
self-regulation whereby the respondent was guided by values and principles
antithetical to gambling excessively. Consequently they did not experience a need to
set limits around their gambling behaviour, but were very clear about when their tolerance for gambling and remaining in the venue was at its limit.

Controlling gambling by ceasing at a defined limit may be relatively simple when gambling does not harbour a covert goal. However when respondents also saw gambling as a strategy to promote or maintain status, for example, limiting the behaviour may actually be experienced as an impediment to that goal. Continuing to gamble was an attempt to minimise the difference between ideals such as status, for example, and the fact that they were losing heavily.

In summary, there were four styles of limit setting used. One means of successfully limiting gambling resulted from having a pre-defined target spending limit in mind before commencing a gambling session. When behaviour corresponded with this pre-defined target limit, as in the case of bringing only the allocated funds to the venue, there was a successful outcome to the limit. Secondly, when a pre-determined target limit existed, but was exceeded, the outcome may or may not have been successful, depending on the number of revisions to the target limit. One revision of the limit proved to be adaptive, when behaviour corresponded to the respecified target limit, and this was deemed successful. Thirdly, under circumstances where a predefined target limit was exceeded and numerous revisions occurred, a common outcome was spending all available money, and thus failure to apply a limit. The fourth style of limit setting was a vague limit. The individual, whilst acknowledging having a limit, avoided direct discussion of specific target limits and revised limits. In order to avoid the process of revising, these respondents’ limits encompassed a broad range of money, such as between $200 and $500. Specifying broad limits had two adaptive outcomes, of short-term duration. Firstly it avoided the experience of failure that occurred from respecifying and failing to keep limits. Secondly it partially concealed the existence of a win limit. In the long term broad limits are very likely to be maladaptive, associateded with more severe harmful impacts and possibly more resistant to treatment interventions. Both scenarios of repeated revision of limits (RL) and setting vague limits (BL) resulted in expending all available funds. External factors, usually money, operated as an ultimate limit for those individuals who did not successfully apply target limits (BL and RL groups).
Chapter 6: Developing the LMM - emotions and harms

In Chapter 5, Stage 1 of the qualitative analysis was presented in which respondents were grouped according to the cognitive strategies they used to set limits, and their success in meeting those limits. In Chapter 6, Stages 2 and 3 of the development of the Limit Maintenance Model are presented. Although the model is presented in three stages, the analysis of Stages 1 and 2 occurred concurrently, prior to Stage 3. Presenting the development in stages enables cognitive and emotional themes to be separated and described in greater detail. Stage 2 details respondents’ emotions surrounding gambling control, which as one would expect, were not neutral, and also discusses their mood management strategies. Stage 3 provides a post-hoc analysis in which reported Harms were coded and checked for congruence with the risk categories of the Limit Maintenance Model. Given the risk categories were devised on the basis of limit setting behaviour, the distribution of Harms across high and self-regulated groups were as would be expected, and as such provided validity for the model. Self-regulated respondents reported fewer than three Harms, whilst contingency regulated respondents reported three or more Harms.

By overlaying the reported Harms onto the Limit Maintenance Model (page 79), the multiple pathways through the model merged into two distinct groups of respondents – supporting the conceptualisation of successful and unsuccessful limit maintenance: The contingency regulated groups (BL and RL) demonstrating uncontrolled limit setting behaviours and the self-regulated groups (TL, SRL and NSL) demonstrating relatively controlled limit setting behaviours.

Stage 2: Emotional management

Interview texts were coded for a range of emotions including anxiety, nervousness, guilt, unhappiness, depression, anger, sadness etc and comparisons made between high and low risk groups. Very early in the analysis it was apparent that successfully meeting limits without feeling a strong desire to continue gambling was evidence of
self-controlled, and therefore potentially self-regulated groups of gamblers (totalling 20 people). The remaining 14 respondents comprised the contingency regulated groups who frequently exceeded their limits and expressed ambivalence about ceasing a gambling session.

Ambivalence was a key characteristic of contingency regulated respondents who reported wanting to continue a gambling session, even when they believed they should stop. Consequently some contingency regulated gamblers showed a marked tendency to talk about their emotional struggle to resist gambling, while other contingency regulated gamblers were able to rationally discuss the consequences of not restraining themselves.

The consequences of failing at restraint resulted in tangible harms such as debt. Julie associated the amounts lost gambling with being unable to pay her telephone bill or buy groceries, and others equated gambling losses to buying a new pair of shoes or jewellery etc. Jason, a particularly articulate young man, spoke about the way in which his current debts (approximately $20,000) would make it difficult if he were to form a serious romantic attachment. He was aware that his salary would go towards paying off the debt, instead of saving for a house.

Being able to rationally assess the costs of gambling, i.e. gambling losses meant sacrificing other things they wanted to buy, produced a difficult outcome for some youth. The awareness of the consequences translated into experiential knowing of what it meant to lose, and consequently it heightened the emotional-cognitive struggle of those youth wanting to gamble yet believing they should not. At this point it was hypothesised that awareness and the capacity for a realistic appraisal of the consequences of being without money or losing money, may prevent gambling escalating to excess, but also potentially imposed pressure on those who were unable to control their gambling.

Respondents who did not rationally assess the consequences of losing, did not make the association between gambling losses and having to forego something they wanted to buy. A key characteristic that accompanied the lack of rational
assessment of the consequences was engaging in punitive self-talk, and self-blame because of their failure to control. For example Lisa said:

“.... sometimes I think I should not have put that extra money in or that extra five bucks or you know.... I suppose, it is always in your mind. You go oh I should have pulled it out after I got to that amount, you always tell yourself like, I always go, when it reaches this much I will pull it out, and you just go oh no, I have done more. And you just keep playing. That is probably where I argue you know, in yourself you know, I go I should have pulled it out but you just keep playing anyway.”

This quote was typical of the internal dialogue occurring for young people in the RL group.

**Stress**

The experience of, and response to, stressful life events differed between the high and self-regulated groups. Respondents in the self-regulated groups discussed stressful life events that were episodic (as opposed to chronic) in nature and which lead to gambling. Self-regulated respondents were aware that emotions, triggered by specific events, were usually the cause of occasional gambling binges. Andrew, from the self-regulated groups described an episode of gambling in which he exceeded his budget on the Melbourne Cup:

“I was fighting for a promotion which I didn’t have yet and times were a bit hard. I was very anxious to get promoted and the director I had at the moment was quitting his job and I thought I was in jeopardy of my promotion and I was a bit depressed and … [so I gambled more than usual for a while] but I have got it [the promotion] now so it is all sweet.”

Self-regulated respondents identified particular circumstances that triggered episodes of excessive gambling. They articulated and understood how they had
transferred their emotions around a particular event to the gambling environment. Peter described an event where stress lead to gambling:

“I usually gamble after exams or after assignments, anything a bit stressful, I think it’s relaxing, so if I do have something stressful in my life I’ll often gamble after that.”

Peter was aware he used gambling to relax after a period of stress. Given his choice of a highly stressful policing career, he acknowledged that using gambling to relieve stress at this early stage was not ideal. Steve also used gambling as a stress relief, and he articulated a clear understanding of how the process unfolded:

“I was kind of stressed from uni work and I just thought I’d come in here [casino] with my friends, a whole bunch of friends. We started losing and I guess in some ways you don’t really care, because like when you are under stress you think, oh what the hell, go another fifty, go another fifty and it ended up being about two hundred dollars. I think because like, during that period I think, I wasn’t going too well at uni and I guess I was kind of stressed and kind of thinking, don’t really care about anything so that wasn’t too nice. That was when I failed all my assignments. Like I got pretty mad and just started losing. Then went to the bank and got some more money, lost all that, had enough and went home in disgust.”

Steve’s quote captures the frame of mind that accompanied episodic gambling binges of the self-regulated groups. Frustrated by a particular aspect of life, Steve soothed his emotions by gambling. Losing much more than intended, pushed him through anger to self-disgust at which point he was able to regain control of his behaviour. Steve’s quote revealed the interplay of emotions as he got mad and vented his anger through gambling in a way that rebounded back on to himself. Being a self-regulated respondent, Steve responded to his self-disgust by ceasing the session. Contingency regulated respondents reached the same point of frustration and self-disgust, but still did not cease gambling.
Guilt and depression

The most commonly reported emotions in this sample were guilt and depression. Again, for the self-regulated groups the cause of the guilt or depression was able to be identified, and respondents understood that their emotion had triggered a gambling session. For example, two short excerpts from crucial points in Tanya’s interview demonstrated this:

“... the majority of the time I do go gambling yeah I am depressed and p... off. ....... Even more depressed and p..... that I just lost money but it has got me mind off what it was on before.”

Clearly she commenced gambling when she was already depressed to distract herself from the cause of her distress. Stephen communicated the same pattern of depression, gambling, more depression, and more gambling.

“......just getting bored and getting depressed at certain stages of the week, the month or whatever, the year. Major downer is having only a single parent, ...... sometimes I gamble if I'm in a bad mood but other times I feel why should I let these things affect me and make me feel bad? I just tough it out, go cold turkey and tough it out a bit, you know last a couple of hours, couple of days, feel depressed and then just get out of it. Other times I rely on the gambling to get me out.”

Self-regulated respondents were able to clearly articulate the relationship between life events, emotional response, and gambling. This awareness was often adaptive in that it lead to preventative behavioural strategies being activated, for example carrying only the amount of cash you wish to spend.

In contrast to the self-regulated groups, contingency regulated respondents directly and entirely attributed guilt and depression to gambling. For example, Macca felt guilt in relation to gambling because it upset his parents and sister, and he lamented at length about not wanting to worry them. Two of the most excessive gamblers,
Joseph and Jason suffered with guilt feelings also. Joseph felt guilty gambling his dole money while his children had to rely on his own father to provide for them. He believed it was the worst guilty feeling because of the effects on his self-esteem. Jason’s guilt was anticipatory in the sense that he projected his current gambling problems into the future, and realised he would start married life with a $20,000 gambling debt.

Amongst the contingency regulated groups, the experience of depression and guilt was consistent with diminished awareness of underlying problems that may have been the catalyst to commencing a gambling session. Such insights appeared to be obscured by the magnitude of the issues faced e.g. inability to support children or starting a marriage with gambling debts. Respondents experienced these problems as insurmountable, and despaired of ever being able to control their gambling and therefore believed they could not rectify the situation. These respondents understood that they gambled because ‘something’ was making them feel pressured, but were unable or unwilling to identify the source of the pressure, and also unable to formulate a solution.

In summary, because self-regulated respondents’ limits were well defined there was a point at which exceeding limits generated self-disgust and that was a successful trigger to end the gambling session. Awareness of the consequences of losing money was well articulated and followed up with adaptive behavioural strategies, such as bringing only gambling money to the venue, which protected them from exceeding limits. Self-regulated respondents said generally they got annoyed with themselves when they lost, but didn’t launch into a tirade of self-abuse about their lapses of control. The episodic nature of gambling ‘binges’ for this group was far different from the sustained losses and enduring emotional distress of the contingency regulated respondents. The contingency regulated groups were so preoccupied by blaming themselves for control failure, that in only rare instances did they demonstrate any understanding about how their emotions contributed to failing to restrain their gambling.

Contingency regulated respondents, all of whom did not maintain their limits, experienced more emotional intensity about their gambling than those who could
maintain limits (self-regulated groups). In particular, the BL group focussed heavily on their inability to cease a gambling session. They did not articulate what it was that made them gamble to excess and denigrated themselves for their failures to stop. Depression and guilt were more marked and most common amongst the BL group. As preoccupation with negative emotions escalated, there was an associated decrease in successful implementation of rational, goal-oriented behaviours around limit setting. Gambling while feeling guilty and depressed appeared to further erode attempts at self-control. The RL group’s struggle with the emotional-cognitive tug-of-war between gambling and restraint was well articulated, indicating they were still attempting to maintain control, whereas the BL group had become resolved to failure.

Coping strategies

To investigate whether the failure to control gambling was accompanied by a particular style of coping with negative emotions, interview texts were investigated for themes relating to mood control. Respondents were asked whether they ever got into bad moods generally (not related to gambling) and if so how did they get out of them? Responses are tabulated in Table 6 (page 113), divided into two types of coping strategies, positive and negative. Positive strategies include undertaking activities, seeking out friends, taking time out from the issue, and dealing with the thoughts surrounding the bad mood. Using such activities as a distraction from a bad mood was a common strategy employed twice as often by self-regulated respondents as by contingency regulated respondents.

Self-regulated respondents were the only ones to use physical activity to deal with bad moods. Peter said:

“I like to run, if I’m really, really angry I just like to just get out of the house and just run until I am exhausted and it gets a lot of frustration out. … So if I’m upset or something I just exercise by running.”

Contingency regulated respondents used more solitary activities, such as working on cars as a distraction from their moods; with emphasis on solitude rather than the activity.
Table 6: Strategies to Manage Moods

<table>
<thead>
<tr>
<th></th>
<th>Contingency regulated</th>
<th>Self-regulated</th>
<th>Total*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive Strategies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>3</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Friends</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Time out</td>
<td>0</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Rational self-talk</td>
<td>2</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td><strong>Problematic Strategies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solitude/Denial</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Forced Time out</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Substance/Gambling</td>
<td>7</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

*Responses are not mutually exclusive.

Equal numbers from the two groups of respondents sought out friends as a distraction, but the groups differed most in their use of time out and managing thoughts. Two self-regulated respondents said they stepped away from the issue that created the mood for a little while and seven people in all (5 self-regulated respondents), worked through the cause of their mood at a cognitive level. For example, Steve applied a successful cognitive problem solving strategy to the cause of his upset and carried through with supporting behaviours:

"... like for example when you have failed an assignment you think, oh, I have to really study, really study. So you get stuck into it. After one or two weeks you kind of forget about it so that kind of gets me out of the mood and I just feel okay after that."

The more maladaptive strategies used to deal with mood were seeking solitude, concealing or denying the issue, being forced to forget about the issue and using alcohol or gambling to regulate the mood. The contingency regulated respondents were more likely to seek solitude to overcome a bad mood, but not as an opportunity to take time out before solving the problem – rather they were concerned not to impose their bad mood on to others. Each of the contingency regulated respondents
said they used an enhancement to deal with moods. The enhancement included using food, alcohol and/or gambling to alleviate dysphoric moods. Four of the seven used gambling for this purpose.

Maladaptive coping strategies, i.e. gambling to deal with dysphoric mood was reported far more frequently by the contingency regulated groups. Two contingency regulated respondents were using rational self-talk to deal with moods, but their efforts were difficult to sustain because they were preoccupied with attempting to control their gambling. Whilst some of the contingency regulated groups were using some positive strategies to deal with moods the self-regulated groups were more consistent and effective in their use of positive strategies (18 occurrences compared to 7).

**Summary of Stage 2**

It has been demonstrated from the interviews, through the investigation of contingency regulated and self-regulated groups, that with increase in emotional intensity surrounding gambling for the contingency regulated groups was associated with fewer instances of successful limit setting. Coping strategies used by the self-regulated respondents to regulate mood (gambling related or otherwise) were adaptive and therefore likely to be more successful than the predominantly avoidant coping strategies used by the contingency regulated respondents. In brief, the culmination of Stages 1 and 2 of the development of the LMM is summarised in Table 7 (page 115), which outlines the characteristics of contingency regulated and self-regulated gamblers.
Table 7: Emotions/Coping Strategies for Contingency and Self-Regulated Groups

<table>
<thead>
<tr>
<th>Self-regulated (n=20)</th>
<th>Contingency regulated (n=14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Cease gambling before losing all available money.</td>
<td>• Forced to cease gambling by exceeding funds.</td>
</tr>
<tr>
<td>• Experience no ambivalence about ceasing gambling.</td>
<td>• Experience ambivalence about ceasing a session.</td>
</tr>
<tr>
<td>• Articulate limits and an understanding of the value of money.</td>
<td>• Emotional response to control failure leads to self-blame.</td>
</tr>
<tr>
<td>• Less emotional focus; emotion aimed at stressful and episodic events.</td>
<td>• No awareness of the cycle of control failure, emotional preoccupation and continual gambling.</td>
</tr>
<tr>
<td>• Aware of the link between their emotional responses to an event and prolonged gambling sessions.</td>
<td>• Reliance on external sources of regulation, such as alcohol, food and gambling.</td>
</tr>
<tr>
<td>• Use adaptive strategies for mood control.</td>
<td>• Experience guilt and/or depression.</td>
</tr>
<tr>
<td></td>
<td>• Use avoidant strategies for mood control.</td>
</tr>
</tbody>
</table>

Stage 3: Gambling related Harms

It has been established that the Limit Maintenance Model comprises cognitive and emotional components which interact to strengthen or weaken one’s capacity for self-control. The Harms respondents reported are detailed at Stage 3 (below). They effectively provide a validation for the model, by showing that high and self-regulated groups developed on the basis of limit setting, also discriminate the experience of harm, as reported generally in the gambling literature. As such, Stage 3 provides:
- Description of harms and their frequency of occurrence.
- Mapping of harms to limit setting characteristics.
- Validation of the high and low risk categorisations.
- Sequential ordering of harms as they were reported.
- Investigation of harms and demographic data by risk level.

**Description of harms and frequency of reporting**

Nine harms were identified from detailed examination of the interview texts. The following summary outlines the criterion for inclusion in each harm category.

**Money**
Reduced financial circumstances resulting in inability to pay rent and utilities, to purchase food, or requiring a drop in standard of living, such as not being able to go out for dinner or entertainment.

**Mood**
Dysphoric mood attributed to gambling. Predominantly depression, guilt or anger due to losing more money than intended, and/or failing to control gambling. Also boredom due to gambling, and frustration with friends who did not want to leave the venue.

**Relationship Conflict**
Experiencing conflict in a relationship expressly because of gambling and surrounding issues. Commonly with girlfriends and boyfriends, but particularly marked and intensified when with parents.

**Self**
Intrapersonal discord. Self-blame, self-abuse and negative self-image due to gambling and inability to control gambling.
Career
Ways in which gambling has explicitly jeopardized work/career. For example, lateness and absenteeism, and particularly indications that time and energy invested in gambling has undermined promotion.

Possessions and Default
Pawning possessions to finance gambling and/or defaulting on loan/rental agreements.

Severed Relationships
Extreme conflict with friends or family to the point of cut-off. Withdrawal from a significant personal relationship, or having a significant person withdraw from them.

Criminal Acts
Stealing money from work and/or friends and parents.

The most frequently reported Harm was the experience of financial hardship due to losing money. Each respondent in the BL and RL groups reported that they had experienced a shortage of money due to gambling. Peter typifies the type of comments made in relation to financial Harms:

"... often weeks that you’re not able to afford things that you should be able to afford, like that new pair of shoes, or the jeans .... not being able to spend money ... [on] things that you need, like I mean car insurance or something like that. The phone bill, the phone bill's a classic ..."

Nine out of 20 respondents in the self-regulated groups also reported financial harms. The consequences of losing money were heavily emphasised by respondents during interviews, and accounted for considerably more text units\textsuperscript{18} than did any other of the Harms. There were 94 paragraphs of text coded to the money

\textsuperscript{18} A text unit is a paragraph of text devoted to a particular topic, and split at the point where the topic changes. As such it provides a measure of the extent of the dialogue surrounding a single harm.
node, with the next most verbalised harm being mood at 47 paragraphs coded. As financial issues were first and foremost for respondents, the relationship between money and each other harm was investigated. The response patterns differed according to limit setting style.

Relational mapping of Harms to limit setting characteristics

Table 8 (below) provides the likelihood ratio of reporting each of the nine harms\(^{19}\) in relation to reporting financial harm.

**Table 8: Likelihood of Reporting Harms**

<table>
<thead>
<tr>
<th>Harm</th>
<th>BL group</th>
<th>RL group</th>
<th>NSL group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=7</td>
<td>n=7</td>
<td>n=20</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>1. Money</td>
<td>100</td>
<td>100</td>
<td>45</td>
</tr>
<tr>
<td>2. Mood</td>
<td>100</td>
<td>57</td>
<td>78</td>
</tr>
<tr>
<td>3. Relationship Conflict</td>
<td>71</td>
<td>43</td>
<td>43</td>
</tr>
<tr>
<td>4. Career</td>
<td>57</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5. Self</td>
<td>43</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6. Possessions and defaults</td>
<td>43</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7. Severed relationships</td>
<td>29</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8. Criminal acts</td>
<td>29</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Looking at the second harm in Table 8 (above), there was a 100% correspondence between BL group respondents reporting of money related harms and mood related harms. The likelihood of RL group respondents reporting a mood related harm was 57% and for the NSL group it was 78%. The higher ratio between money and mood harms in the NSL group seems contrary to expectation but is likely to be due to a greater awareness of how gambling affected their mood. Because gambling was an activity from which they derived limited enjoyment, the NSL group was very aware of becoming bored and frustrated with gambling. The BL group was involved to such an extent with gambling that the mood swings that accompanied wins and losses

\(^{19}\) The ninth harm reported was the effects of alcohol, and is noted separately on page 148.
were reported as part of their daily mood orientation - and the effect of a gambling session on their mood may have been less obvious to them, regardless of whether it was beneficial or detrimental. This suggests that when completing psychometric instruments self-regulated gamblers may be predisposed to report higher incidence of emotional harms, and the reverse.

Figure 3 (below) demonstrates the relationship between the LMM and reported Harms, using the three main groupings identified in the model; BL, RL (contingency regulated) and self-regulated (comprising NSL, TL and SRL groups).

![Graph showing Harms reported by level of risk]

**Figure 3: Harms reported by level of risk**

The third most commonly reported harm was experiencing conflict in personal relationships. For the BL group there was a 71% correspondence between reporting financial harms and relationship conflict. The high probability of relationship conflict was indicative of the level of involvement that BL group respondents had with gambling. For both the RL and self-regulated groups, reporting money related harms was accompanied by a 43% likelihood of experiencing conflict in relationships. However, the quality of the comments surrounding relationships varied between the RL and self-regulated groups. The self-regulated groups reported relationship conflict at the venue, primarily about whether to leave or stay, whereas the RL group
reported conflict about the amount of money spent either during the session or at a later time. The BL group respondents reported enduring (often daily) conflict with friends and/or parents due to their continuing involvement with gambling.

Validation of Contingency regulated and Self-regulated groups

The BL group and the RL group were both unsuccessful in meeting limits. The former were likely to have respecified their target limit as a win limit and the latter continually revised target limits. Successful limits were set by the self-regulated groups; NSL, SRL and TL. The 20 respondents in self-regulated groups a) succeeded in maintaining their specified target limit (n=12), or b) maintained their limit after a single revision (n=5) or c) were unlikely to gamble excessively and therefore imposed no conscious limit (n=3).

Table 9 (page121) shows the reported harms according to success in meeting limits. Respondents who successfully maintained limits reported issues to do with money, mood and relationships that were harmful to their lives. There was an absence of any of the harms listed from number 4 onwards. Respondents who were unsuccessful in maintaining their money limits reported more instances of the first three harms, Money, Mood and Relationship Conflict than respondents on the successful side of the Limit Maintenance Model and also were the only respondents to report the latter five harms.
Table 9: Frequency of Reported Harms by Limit Setting

<table>
<thead>
<tr>
<th>Harm</th>
<th>Self-regulated (successful limit setting)</th>
<th>Contingency regulated (unsuccessful limit setting)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Money</td>
<td>n=20, % 9 45</td>
<td>n=14, % 14 100</td>
</tr>
<tr>
<td>2. Mood</td>
<td>n=20, % 7 35</td>
<td>n=14, % 11 79</td>
</tr>
<tr>
<td>3. Relationship conflict</td>
<td>n=20, % 3 15</td>
<td>n=14, % 8 57</td>
</tr>
<tr>
<td>4. Career</td>
<td>n=20, % 0 0</td>
<td>n=14, % 4 29</td>
</tr>
<tr>
<td>5. Self (Intrapersonal)</td>
<td>n=20, % 0 0</td>
<td>n=14, % 4 29</td>
</tr>
<tr>
<td>6. Possessions and defaults</td>
<td>n=20, % 0 0</td>
<td>n=14, % 3 21</td>
</tr>
<tr>
<td>7. Severed relationships</td>
<td>n=20, % 0 0</td>
<td>n=14, % 2 14</td>
</tr>
<tr>
<td>8. Criminal acts</td>
<td>n=20, % 0 0</td>
<td>n=14, % 2 14</td>
</tr>
</tbody>
</table>

By comparison, Table 10 (below) shows the reported incidence of harms for gamblers and their partners in an adult sample taken from the Client and Analysis Report No 7. (Reproduced from Department of Human Services, Victorian Government; 1st July, 2000 to 30th June, 2001). In this adult sample financial issues are the second most frequently reported harm for females, whereas for youth and adult males they are the primary area of concern.

Table 10: Incidence of Harm for Gamblers and their Partners

<table>
<thead>
<tr>
<th>Harm</th>
<th>Male</th>
<th></th>
<th>Female</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Financial</td>
<td>870</td>
<td>60.2</td>
<td>863</td>
<td>59.4</td>
<td>1,733</td>
<td>59.8</td>
</tr>
<tr>
<td>Employment related</td>
<td>390</td>
<td>27.0</td>
<td>318</td>
<td>21.9</td>
<td>708</td>
<td>24.4</td>
</tr>
<tr>
<td>Leisure use</td>
<td>553</td>
<td>38.3</td>
<td>601</td>
<td>41.3</td>
<td>1,154</td>
<td>39.8</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>733</td>
<td>50.8</td>
<td>747</td>
<td>51.4</td>
<td>1,480</td>
<td>51.1</td>
</tr>
<tr>
<td>Family</td>
<td>838</td>
<td>58.0</td>
<td>944</td>
<td>64.9</td>
<td>1,782</td>
<td>61.5</td>
</tr>
<tr>
<td>Legal</td>
<td>576</td>
<td>39.9</td>
<td>674</td>
<td>46.4</td>
<td>1,250</td>
<td>43.1</td>
</tr>
<tr>
<td>Physical</td>
<td>264</td>
<td>18.3</td>
<td>218</td>
<td>15.0</td>
<td>482</td>
<td>16.6</td>
</tr>
<tr>
<td>Gambling</td>
<td>187</td>
<td>13.0</td>
<td>269</td>
<td>18.5</td>
<td>456</td>
<td>15.7</td>
</tr>
</tbody>
</table>

1,356            | 93.9   |          | 1,399  | 96.2     | 2,755  | 95.1     |

NB: Categories are not mutually exclusive.
The harm categories least frequently reported were career, possessions and default, severed relationships and crime. Notably only contingency regulated respondents reported any experience of them. The data suggests that the harm categories of money, mood and relationships were most salient at the time of interview - given interviews took place in venues, for example respondents argued with their partners about when to leave the venue. The five harm categories least often reported, (only by the contingency regulated groups) crime, severed relationships possessions and defaults, self and career are more likely to be experienced over time as a result of sustained involvement with gambling (Schellinck & Schrans, 1998). Particularly evident was the BL group’s level of relationship conflict, which developed into cut-off or withdrawal from (or by) a significant other. In this sample of young gamblers money, mood and conflict in relationships are by-products of gambling that occur even when control is relatively intact (i.e. when limits are being achieved) while other impacts are an indicator of failure at limit setting. This suggests that sustainable gambling in this age group will include the experience of money, mood and relationship harms.

Sequential ordering of Harms as they were experienced

In an Australian study (Dickerson et al., 1997a) an analysis was undertaken to determine the causal relationships between gambling harms. The harms were found to cluster, with no particular relationship between them. Simply having one problem was the best indicator of another problem(s). In this study there appeared to be an ordered relationship between harms. The ranking of most frequently experienced harms was the same for both groups of respondents. Difficulties surrounding money was the most commonly reported problem for high and self-regulated respondents, and similarly gambling related dysphoric mood was the second most commonly reported problem for both groups. The actual numbers of people in the high and self-regulated groups reporting the harms were disparate, but the order in which they were experienced was the same.

Any respondent represented at the harm listed at number 8 (Criminal Acts) also reported each of the prior harms from 1 through 6. Whilst both groups reported money, mood and conflicted relationships, only contingency regulated respondents
mentioned affects on self, career, possessions/default, severed relationships and crime.

This suggests a sequence of harmful events that occurs as youth become more involved with gambling. The sequence did not differ according to level of risk, but actual numbers of harms reported was much higher in the contingency regulated groups. Consequently, the Limit Maintenance Model discriminates between between high and self-regulated gamblers on 3 inter-related levels: limit setting style (cognitive), dysphoric mood (emotions) and the harms experienced. In short, that there is a predictable order to the harms experienced by youth.

The first harm experienced was financial difficulty and a reasonable hypothesis is that continuing financial pressure triggers depression, guilt or anger at further losses. The experience of dysphoric mood then manifests in relationships as conflict, which in turn triggers negative self-image (Self) which may be the catalyst for more serious events relating to selling possessions and criminal acts. Similar kinds of self-defeating harms are reported via chasing and reducing options (Lesieur, Blume & Zoppa, 1986; O’Connor, 2000) and in attachment theory (Orford, Morrison & Somers, 1996).

**Basedata and risk level**

There were no statistically significant differences to suggest that income, occupation, or other basedata characteristics (Appendix 8) were central to control issues or the experience of harms. The basedata categories, age, partner status, students, income, occupation, and living situation, showed no relationship to level of risk. Examination of basedata showed that the contingency regulated groups contained one out of 6 students, six out of 15 full-time workers and five out of 10 who were unemployed. A particularly notable characteristic occurred in education, where only 1 out of 7 tertiary graduates was coded as being at high risk. Based on this sample, it is possible that tertiary education decreases the likelihood that youth will experience gambling related harms, and education may be the single factor clearly associated with being at low risk.
The relationship between alcohol and gambling was not an avenue of enquiry pursued in this thesis. However it seems noteworthy that more self-regulated respondents reported that alcohol impeded their control over gambling. As emphasised throughout stages 1 and 2, the self-regulated groups demonstrated greater awareness around personal issues and as such would be more likely to be aware of the effects of alcohol on control of gambling. Further, as the self-regulated groups ostensibly did control their gambling, the commonly experienced impaired control resulting from alcohol consumption would be likely to be more obvious. For other respondents whose control was often impaired, the effect of alcohol on the control process may be less marked and more difficult to monitor.

**Key Outcomes from the Qualitative Study (Chapter 6).**

As concluded in the literature review, although the actual prevalence of the harmful impacts of gambling on youth remains a matter for debate, there have been no findings or predictions that it will be less than the rate for adults. There is no doubt that youth do experience significant harm arising from their gambling (Jacobs, 2000; Maddern & Dickerson, 1999; NRC, 1999; Productivity Commission, 1999; Shaffer & Hall, 1996; Winters et al., 2002) therefore one outstanding current question is why the incidence of youth problem gamblers at counseling centers is so low. With the assumption that youth know how and where to seek help, Gupta and Derevensky (2000) noted the low incidence of youth reporting for treatment at the McGill University Research and Treatment Clinic. The Clinic received referrals from friends or families of youth gamblers and also by word of mouth. It is notable that all of their clients were male.

In Australia (table 11, page125), treatment data (Client and Analysis Report No 7: Department of Human Services, Victorian Government; 1st July, 2000-30th June, 2001) provides a breakdown of age cohorts reporting to counselling services in Victoria during the 12 month period to June 2001. Clients aged less than 20 years had by far the lowest reporting incidence (1.5% males and 0.4% females) of all age groups.
Table 11: New Clients: Problem gamblers by sex and age

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th></th>
<th>Female</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>&lt;20</td>
<td>21</td>
<td>1.5</td>
<td>5</td>
<td>.4</td>
<td>26</td>
<td>.9</td>
</tr>
<tr>
<td>20-29</td>
<td>370</td>
<td>25.7</td>
<td>217</td>
<td>15.7</td>
<td>587</td>
<td>20.8</td>
</tr>
<tr>
<td>30-39</td>
<td>518</td>
<td>36.0</td>
<td>379</td>
<td>27.4</td>
<td>897</td>
<td>31.8</td>
</tr>
<tr>
<td>40-49</td>
<td>338</td>
<td>23.5</td>
<td>399</td>
<td>28.9</td>
<td>737</td>
<td>26.1</td>
</tr>
<tr>
<td>50-59</td>
<td>146</td>
<td>10.1</td>
<td>271</td>
<td>19.6</td>
<td>417</td>
<td>14.8</td>
</tr>
<tr>
<td>&gt;60</td>
<td>47</td>
<td>3.3</td>
<td>110</td>
<td>8.0</td>
<td>157</td>
<td>5.6</td>
</tr>
<tr>
<td>Total</td>
<td>1,440</td>
<td>100.0</td>
<td>1,381</td>
<td>100.0</td>
<td>2,821</td>
<td>100.0</td>
</tr>
</tbody>
</table>

American researchers Winters and Anderson (2000) suggested several possible reasons for the low incidence of youth reporting for treatment. Firstly, it may be due to low pathology rates for youth gamblers. However it has become increasingly clear from the literature that this age group does experience severe problems related to gambling (Jacobs, 2000; NRC, 1999; Shaffer & Hall, 1996; Winters et al., 2002; Productivity Commission, 1999; Maddern & Dickerson, 1999). Secondly, Winters and Anderson (2000) suggested that youth lack awareness of the issues arising from gambling. This reason has good face validity given the findings in the current study. Having a lack of awareness of the consequences of gambling proved to be a risk factor for impaired control of gambling. The lack of awareness implies that the extent and implications of the problem are not sufficiently well understood to provide the impetus for the youth to seek help. The third proposition put forward (Winters & Anderson, 2000) was that problems caused by insufficiently developed psychosocial skills overshadow the gambling control problem. Hence, youth report to treatment services for reasons other than gambling. This proposition also gains credence from the current study, given the significant association between psychosocial skills and the capacity to set and maintain monetary limits when gambling (chapter 5).

The empirical data gathered for this study further suggests that with no dependents, and very often no savings plans, youth have a high proportion of their funds available as disposable income. This financial freedom limits the extent to which harm radiates throughout their life. Without dependents and with flexible financial constraints, the costs of gambling are more circumscribed and containable. Under
these conditions impaired control of gambling is less likely to produce recognisable
symptoms, until such time as the financial hardships are severe enough to impact
further along the sequence of harms, on relationships for example. If so, it is likely
that youth will present to counselling with psychosocial problems and not gambling
problems, as Winters and Anderson (2000) have suggested.

The crucial element of the problem of youth not reporting is that under some
circumstances the consequences of gambling problems can be more long term for
them, having severe impacts in adulthood. For example, several youth in the present
sample lost educational opportunities as a result of their gambling. University
courses were forfeited and exams failed as a result of gambling. In other situations
jobs were lost and promotions missed because of losing trusted employee status,
due to gambling. While these events occur for adults also, they can be crippling for a
young person in the early stages of career development.
Figure 2: The Limit Maintenance Model
Research issues arising from the Limit Maintenance Model

The Limit Maintenance Model provides original knowledge about how youth maintain and relinquish control of gambling. First and foremost, youth gamblers do set limits to their gambling expenditure. The majority of the sample had a limit in mind prior to commencing a session. Their efforts to meet that limit varied sufficiently to characterize five distinct styles of limit setting (Figure 2, reinserted page 127). Three styles - No Specific Limits (NSL), Target Limits (TL) and Single Revised Limits (SRL) - were consistent with successfully setting and applying a limit. Two styles Revised Limits (RL) and Broad Limits (BL) resulted in repeated violation of the limits.

Contrary to common belief, it was a subgroup of the Self-regulated groups (NSL) that commenced a session without a pre-defined financial limit in mind. No specific conscious limit was pre-determined, but a limit was recognised once it was reached. Generally, the Self-regulated groups were intrinsically motivated to end the session long before their expenditure reached crucial levels. Consistent with maintaining limits was a set of goals, values and/or activities that took precedence over excessive time and money expenditure on gambling. Self-regulated respondents demonstrated the capacity for intrinsically derived self-regulation, without the need for external contingencies to guide their behaviour. In contrast to the small group of self-regulated respondents it was significant that other participants, all of whom specified a limit, were in fact at greater risk of harmful impacts resulting from their gambling.

The actual naming of a limit, and the manner of specifying it are both implicated in the processes whereby youth gamblers try to control their gambling. The series of events contained within the Limit Maintenance Model has identified a mechanism by which control over gambling is eroded and youth fail to keep gambling within safe limits. Reaching a target limit (Figure 2 reinserted, page 127) was a pivotal stage between succeeding or failing to control gambling. Respondents with sufficient intrinsic motivation to drive self-regulation were able to successfully maintain their limit after having revised it once. Success after a single revision was indicative of adaptive, and therefore mature, self-regulation. However, proceeding to a second revision was the catalyst for continual limit revisions. As a consequence,
respondents experienced themselves as failures as each successive limit was exceeded. The cumulative effects from the limit violation were severe. In particular, youth came to believe they had little or no capacity to control their gambling.

A further consequence of repeated failure was that youth became preoccupied with attempts to maintain their limits. During the process they focussed on their inability to control gambling. The dysphoric emotions this generated, further complicated attempts at control by hindering the process of defining, setting and maintaining limits. In fact, one style of limit setting (BL) was associated with a chronically diminished sense of control-efficacy. Limits were defined yet remained ambiguous enough to circumvent the emotional impact of the repeated failures experienced by those who continually revised their limits (RL). Setting broad limits (BL) served to avoid repeated limit setting failure. This was achieved by converting control of gambling from an inhibitory behaviour necessitating consistent monitoring of limits, to an appetitive behaviour for which they set win limits for the session.

The progression from continually revising limits through to respecifying as a win limit provides unique insight into how youth with insufficiently developed self-regulatory skill become problem gamblers. This phenomenon has been documented in alcohol literature as the Limit Violation Effect (Marlatt, 1985). The Limit Violation Effect occurs when one’s sense of control efficacy is eroded by repeatedly exceeding limits. The result is that constant failures lead to hopelessness and despair, and ultimately to abandoning attempts at control altogether. The effect of the limit violation has been marked and severe in this study. Because the Limit Violation Effect (Marlatt, 1985) is well documented in the addictions literature, it was possible to test it using a quantitative methodology. Chapter 10 presents the Temptation and Restraint Inventory (Collins & Lapp, 1992), a model of alcohol use that has grown out of the theoretical work on the Limit Violation Effect (Marlatt, 1985). The Temptation and Restraint Inventory (Collins & Lapp, 1992) was adapted for a gambling sample, and identifies the struggle between the emotional impetus to gamble and the cognitive restraints that guard against excessive gambling.

By identifying the Limit Violation Effect (Marlatt, 1985), the Limit Maintenance Model has shown the interplay between cognitions and emotions surrounding control. In
the section on harms and emotions (above) youth who were unsuccessful at limit setting reported using gambling as an escape from negative affect, and were unable to identify how their emotions affected their gambling control. There are two key points arising from these findings. Firstly, managing one’s emotions is a hallmark of maturity, generally, and managing one’s emotions in relation to gambling losses is imperative to maintaining control. Secondly, being unable to meet an imposed limit by any means other than an external contingency, e.g. finishing a session only because the money had run out, indicated that the capacity for self-control had not been sufficiently developed.

Because control of gambling is dependent not only on self-regulatory skill, but also on self-management of emotions, it is therefore important that youth problem gambling be seen in the broader context of their social and psychological development. Most importantly a developmental approach addresses the issues raised in the literature review (Chapter 3) that to date researchers have relied on adult research findings and transferred them to youth on the assumption that the characteristics of problem gamblers do not differ with age. In fact, the period bridging adolescence and adulthood contains highly salient instances of transitions in relationships and in individual functioning relevant to autonomy and self-regulation.

In this sample, foremost of these transitions was striving for personal and financial independence, to move away from parental control. 

Ironically the self-regulatory capacities needed to achieve individuation are attributes or inner resources that are influenced by parents themselves, and parenting practices. During their formative years youth are largely dependent on parents for support and guidance, and parents therefore play a major role in the socialisation of behaviour. Parental behaviour supports children in learning to moderate behaviours that would irritate or injure others, and youth thereby acquire skills that will support successful adult functioning (Bartle-Haring, 1997; Bartle-Haring & Sabatelli, 1997).

Psychosocial maturity is a measure of the extent to which youth have been able to successfully develop the skills needed for adulthood. Such skills will mediate the

---

20 The majority of youth lived at home with their parents. The contingency regulated groups reported the greatest amount of conflict, particularly with parents.
capacity to set limits and consequently the experience of gambling related harms. The identification of youth’s psychosocial strengths and weaknesses in a developmental framework should therefore provide valuable information about preventing excessive gambling, and about resilience to any problems it may create. A detailed psychosocial profile could therefore be an informative influence on intervention and prevention programmes. A developmental approach of this nature acknowledges the transitions occurring for youth and was the obvious next step in the research process. Chapters 7 and 8 (following) examined the validity of the Limit Maintenance Model in relation to psychosocial maturity.
Chapter 7: Measuring autonomy and related psychosocial skills

Introduction

Chapter 7 sets out the introduction and methodology for the examination of the psychosocial development of the same cohort of 34 young gamblers introduced in Chapter 5. Chapter 8 provides the results and discussion of the investigation of the relationship between psychosocial maturity, self-regulation and reported Harms.

When analysing the interview text during the development of the LMM, the ability of respondents to set gambling limits was discussed as a function of self-regulatory style. A crucial element of self-regulation was the degree to which behaviours were externally initiated and controlled versus self-initiated and managed. Some respondents were able to apply and maintain their set limit, whilst others relied on an external contingency to force the end of the session. Youth reliant on external factors can therefore be classed as contingency regulated gamblers, and those who successfully managed their gambling by relying on internal factors, as self-regulated gamblers.

Self-regulated gamblers were intrinsically motivated (Deci & Ryan, 1985) to limit their gambling. Limits were set and maintained freely conveying the sense of personal agency consistent with truly autonomous behaviour (Kuhl, 1992). However, the control exercised by contingency regulated gamblers was coercive in nature, occurring because of feelings of pressure or anxiety. Contingency regulated gamblers reported a greater number of Harms and their experience of those Harms was more intense than the experiences reported by self-regulated gamblers.
As evidenced by the interviews, strategies for coping with Harms whilst simultaneously attempting to control an addictive-like activity varied greatly from person to person. Chapters 7 and 8 propose that the experience of addictive gambling will be uniquely personal and inter-related with the developmental skills available to each individual. Further, the development of positive psychosocial maturity skills will be consistent with the capacity for successful self-regulation, and will mediate the Harms associated with impaired control. The means of testing this was available through the original data set. Before moving to describe the methods selected, the theoretical constructs of development are reviewed.

**Autonomy**

Autonomy is a broad developmental theme common to self-regulation and developmental theories. There are many and varied definitions of autonomy, all of which are conceptually similar. Particularly relevant to the current study is Hill and Holmbeck’s (cited in Collins, Laursen, Mortensen, Luebker & Ferreira, 1997, p.162) proposal that autonomy refers not simply to gaining freedom and separation from authority structures, but also encompasses the "capacity for making decisions regarding one's own life, for taking responsibility for one's own behaviour, and maintaining supportive relationships". Autonomy implies striving towards the ideals of self-direction and independence, and is thus a key factor promoting self-regulation (Maccoby & Martin, 1989). Self-regulation subsumes the concept of autonomy in that it contains the further element of behavioural management of self in relation to others: In essence, maintaining self-direction in the face of external pressures.

The developmental literature on the origins of autonomy, and the cognitive-developmental literature on self-regulation state that both are learning outcomes facilitated by positive child-rearing strategies (Collins et al., 1997. Supportive parents will foster and reward a child’s attempts at autonomy, thereby reinforcing the move towards self-regulation. However, success in applying self-regulation may vary from context to context. In parent/child relationships, for example, the child’s strivings
towards autonomy may be compromised because parents have not encouraged independence, or because the child may be resisting the challenge of autonomy and forcing the parent(s) to remain controlling (for a review see Collins et al., 1997). Under such circumstances the behaviour of the parent and/or child is less than optimal and the development of autonomy is impeded. In the case of addictive behaviours, these early socialisation patterns are important markers of the capacity to develop self-regulation in later life. In fact, the severity and duration of an addictive behaviour varies according to the level of self-regulation that a person has achieved (Diaz & Fruhauf, 1991).

**Psychosocial development in youth gambling**

Erikson’s theory of psychosocial development has been truly enduring. Along with Freud, Rogers and Piaget, every undergraduate psychology student, and those in neighbouring disciplines, have at some time studied Erikson’s developmental stage theory. Erikson asserted that human development over the lifespan passes through eight stages in a fixed order, with each stage presenting its own unique conflicts. Each conflict was thought to be experienced as a crisis, and resolution of the crisis was the means of transcending the corresponding developmental task. This influential theory was extensive, generating a theory of the entire life cycle.

Erikson stated that the psychological components of each age-related stage exist potentially in earlier stages, just as they linger in later ones (Erikson, 1959) and also that constructs may return to prominence when elicited by particular psychosocial contexts. Essentially, no developmental task was ever thought to be fully completed (Riegel, cited in Viney & Tych, 1985). Striving for psychological maturation assumed a continual integration of experiences as part of the process of more fully becoming oneself (Erikson, 1959).

The disorderly manner in which Erikson proposed that maturity occurs, makes it difficult to view development as being contained to a given time period (i.e. stage).
Generally, constructs lower in Erikson’s hierarchy should be in use before those higher in the hierarchy, and so accumulating experiences along the hierarchy is often associated with increasing age. Thus, the notion that stages are age-graded has good credibility. Empirical evidence to support Erikson’s epigenetic principle is based on satisfactory correlational studies in which the stages performed as would be expected in comparison to various scales (Wang & Viney, 1997). However, the current study focused on a narrow cohort (aged 16 to 24 years) and the notion of age-graded stages is therefore less critical.

**Erikson’s theory of development**

The Eriksonian theory of psychosocial development (Erikson, 1959) provides a solid theoretical foundation from which to investigate psychosocial maturity. Viney (1983, and subsequently in Viney & Tych, 1985) formulated Erikson’s stages into content analysis scales to measure Psychosocial Maturity (CASPM). A set of scales were designed to measure both the positive and negative aspects of Psychosocial Maturity. Use of the Content Analysis Scales for Psychosocial Maturity (CASPM; Viney et al., 1995), are outlined in detail in the following section. In contemporary studies they have been used as a means of analysing the process of therapy and to tap suppressed or regressed emotions (Gottschalk, 1971). Most relevant to the current study was its use as a projective assessment of the outcomes of group therapy with young offenders (Viney, Henry, & Campbell, 2001). In these studies the solid theoretical base has enabled deductions to be made from theory about expected relationships between psychological states and behavioural states of youth gamblers.

Erikson’s developmental stages were operationalised by Viney et al. (1995) for use in interviews. Each of the eight stages comprising the CASPM contains two subscales; one a negative aspect of the construct and the other a positive aspect. When resolution occurs in favour of the positive aspect, life outcomes are generally more successful (Viney & Caputi, in press).
The bipolar constructs are summarized at Table 12 (page 139). An outline of Viney’s (1983) and subsequently Viney and Tych’s (1985) formulation follows, beginning with the higher ranking stage of Identity and Identity Diffusion which are based on all other pairs of meanings, progressing through to the earliest constructs Trust and Mistrust. The higher order Stages of Integrity and Despair, and Generativity and Stagnation have been omitted. In this study, as in others using CASPM (Viney, Truneckova, Weekes & Oades, 1999) the constructs of Integrity/Despair and Generativity/Stagnation were found to be inactive in youth samples. It should be noted that although interview texts contained no utterances consistent with these stages, some conclusions are drawn about the ways in which these stages may be affected.

Identity and Identity Diffusion are paired constructs arising from Erikson’s intimacy and alienation constructs. Intimacy is said to be the basis for identity. The key construct of identity is “I am myself, the same me I was yesterday and will be tomorrow”. As this statement suggests, a sense of identity involves a reported sense of self, of personal growth yet continuity, and an assurance about how one appears to others. Awareness of one’s own role in construing one’s identity also leads to greater tolerance of others. Identity diffusion is summarized by the statement: “I am not sure who I am”. It is largely manifested in the experiences people lack. For example, they may report that they lack an integrated pattern of being, an occupational identity, a sense of how one is seen by others, and tolerance for others.

Affinity and Isolation are constructs which have to do with being attracted to or not attracted to others, and recognition or lack of recognition of a common origin with them. Affinity/Isolation provides a basis for identity and identity diffusion. The concept of affinity is: “I enjoy myself when I am with others”. The scoring of the category involves expressions of a sense of fellowship with others or closeness to one’s partner with relationships being experienced as spontaneous, warm and
reciprocal. In contrast the key construct of a sense of isolation is: I don't enjoy myself when I am with others; I feel left out”. When people use this construct they associate negative feelings with being with others; and they often feel lonely. The few relationships in which they are involved are described as unsatisfactory to them.

A sense of affinity versus isolation is said to be achieved only after a sense of Industry has been developed. This sense of Industry is contrasted with a sense of Inferiority. The key construct of industry is: I am what I can achieve”. Industry involves mastery of tasks and problems by reflection, seeing oneself as productive, carrying work to completion and enjoying it. A sense of industry is reflected in people's reports that they know how to be busy, whether they are alone or with others. When people have a sense of inferiority, on the other hand, they describe themselves in the following way: I will never be any good. They lack a sense of mastery and see themselves as unproductive and inadequate. They report frustration in uncompleted work and do not enjoy the work they do. Erikson maintains that before this pair of constructs is developed the young child has to find some balance between initiative and guilt.

Viney’s (1987) work has shown that manifestations of guilt occurred in the more general form of hesitancy about personal power, hence the second pair of constructs was labelled Initiative and Hesitancy. For Initiative the key construct is: I am what I can imagine myself to be. For hesitancy, it is: I don’t know if I can be what I can imagine myself to be”. The first statement is an expression of personal power, typified by reports of a sense of self-activation, self-reliance, enterprise, and social competence. The second reflects uncertainty about that power. When people feel hesitant, they describe themselves not as self-activated but dependent on others and lacking in enterprise. They do not see themselves as socially competent.

If people have come to experience a sense of autonomy, their chances of achieving a sense of initiative are said to be greater. Autonomy is contrasted by Erikson with
shame. Viney has found that the more general expression was manifest as a sense of constraint. The key construct of autonomy is: “I am what I want to be”, that of **Constraint** is: “I cannot be what I want to be”. Autonomy is apparent when a sense of free choice is present along with pride in one’s own independence. Decision making, and self-control without loss of self-esteem are also characteristics of autonomy. When people feel that their self-concept is dominated by the negative aspect of the autonomy/Constraint construct, they are aware of only limited choice. They report loss of dignity, as well as of self-control and potency.

The first central construct of the infant, on which all the constructs later in the sociophenomenological hierarchy are based, is the last to be included here. The task involves interplay between a sense of **Trust and Mistrust**. The later constructs in the hierarchy have been seen to be cognitively and emotionally complex. The present constructs, as befits those which are dealt with from infancy, are simpler. The key construct of trust is: “I am what I am given”. This stage is marked by a sense of optimism, a capacity to have faith in others, as well as oneself, and an ability to accept help from others. A sense of the strength of one’s own body is also scored. The contrasting construct of mistrust, “I cannot be what I am given, because that may be taken away” is associated with reports of pessimism and lack of faith in others as well as oneself. It can also be manifested as a lack of confidence in one’s own body.

Growth occurs by facing and resolving the tension between the polar constructs so that the positive aspect becomes a part of the person’s persona. A less adaptive outcome occurs when the negative pole predominates. The key to achieving growth lies in maintaining a ‘fair ratio’ between the syntonic and dystonic aspects of the conflict (Erikson, 1978; Wang & Viney, 1996).
Table 12 (below) outlines the key experiences of the positive and negative pole of each of the six stages that were active in the current study (Viney et al., 1995).

<table>
<thead>
<tr>
<th>Stage</th>
<th>Key Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identity</td>
<td>I am myself, the same me I was yesterday and will be tomorrow</td>
</tr>
<tr>
<td>Identity Diffusion</td>
<td>I am not sure who I am</td>
</tr>
<tr>
<td>Affinity</td>
<td>I enjoy myself when I am with others</td>
</tr>
<tr>
<td>Isolation</td>
<td>I don’t enjoy myself when I am with others: I feel left out.</td>
</tr>
<tr>
<td>Industry</td>
<td>I am what I can achieve</td>
</tr>
<tr>
<td>Inferiority</td>
<td>I will never be any good</td>
</tr>
<tr>
<td>Initiative</td>
<td>I can be what I imagine I shall be</td>
</tr>
<tr>
<td>Hesitancy</td>
<td>I don’t know if I can be what I imagine I shall be</td>
</tr>
<tr>
<td>Autonomy</td>
<td>I can be what I want to be</td>
</tr>
<tr>
<td>Constraint</td>
<td>I cannot be what I want to be</td>
</tr>
<tr>
<td>Trust</td>
<td>I am what I am given</td>
</tr>
<tr>
<td>Mistrust</td>
<td>I cannot be what I am given because that may be taken away</td>
</tr>
</tbody>
</table>

Research aims and questions

Chapters 7 and 8 explore the psychosocial development of young gamblers from an Eriksonian perspective. The principal aim was to investigate the relationship, if any, between psychosocial maturity and limit setting.

Specifically:

- What, if any, is the relationship between contingency regulated gambling and scores on the CASPM? In particular, is the successful resolution of CASPM constructs related to better self-regulatory skill?
- What, if any, is the relationship between reported Harms and scores on the CASPM? In particular, does better resolution of stages provide a protective barrier to the experience of Harms?
By exploring the relationship between developmental strengths and weaknesses, and reported Harms, it will also be possible to comment on the usefulness of a projective assessment of the potential for youth to experience risks associated with gambling.

Method

Due to the objective and systematic criteria through which it is operationalised (Potter & Levine-Donnerstein, 1999), content analysis is an essentially quantitative methodology. It was originally devised for analysing propaganda during World War II. Prior to the 1950s psychologists began to use content analysis to analyse Rorschach ink blot responses (Weiner, 1998) for themes of anxiety and hostility (Elizur, cited in Viney, 1983). In contemporary research the process remains essentially unchanged. Using nonintrusive open-ended questions, interviewers listen to what the sample respondents have to say. The content analysis methodology requires the acceptance of just one assumption – “that the language people choose to express themselves, contains information about their psychological states” (Viney, 1983, p. 542).

The advantages of the content analysis methodology are numerous. Firstly, utterances of respondents are not constrained. Speech is not pre-empted nor redirected during the interview phase enabling respondents’ experiences to be elicited nonobtrusively and without interference. Consequently, the richness of the data collected preserves the complexity of human experience, commonly sacrificed in forced choice survey questionnaires. Particularly applicable to this sample is that the respondents freedom within the methodology made it sensitive to ambivalence. Given the sample age range (16 to 24 years) and the ambivalence surrounding the desire to stop versus the desire to continue gambling, this was a useful characteristic of the methodology that would not have been available in a forced choice questionnaire.
When based on an established theory, content analysis is highly credible. When generating content analysis from a theory the researcher is challenged to design a coding system which reduces the complexity of all the known attributes to a set of key propositions. Secondly, the propositions of the theory must be operationalised successfully. The design process is deductive as the core concepts of a theory frame the coding rules and subsequently the coding schema. Such theoretically derived content analysis provides congruence with the theory and is of itself an argument for face validity.

By reduction to a set of key propositions content analysis is objective with little need for coders to invoke their own schemas to interpret responses. The content analysis designer(s) sets the standards, i.e. they identify the rules governing whether an utterance is recorded. The coders then compare their coding decisions against a standard set by the experts (or designers) of the coding system. Agreement on interpretation of the rules proves an objective check of the understanding of the researcher and coder (Potter & Levine-Donnerstein, 1999). If the coding matches the standards to within a specified level, the resulting data is valid. The coding scheme is therefore rigorous as the coding is uniform, systematic and scientific. Being objective and systematic, the method lends itself easily to computer applications, and increasingly programmes are being designed to improve on accuracy, efficiency and costliness of the method.

**Procedure and data**

As a preliminary part of this study, the research participants were asked to respond to an unstructured request: "I'd like you to talk to me for a few minutes about what life is like at the moment – the good things and the bad – what it is like for you". This request was made by the interviewer, after rapport was established, but as a first priority in a semistructured interview dealing with gambling related issues. The majority of respondents did not mention gambling during this initial phase. Thus,
CASPM scores were derived from comments about their life in general, and not explicitly about gambling problems.

The maturational processes and psychological states of these research participants were assessed using content analysis. The CASPM scales are based on thematic analysis of free responses. Each of the five active constructs consists of two subscales representing the positive and negative poles of each dimension. Scales were scored based on whether verbalizations met the criterion of scale-specific dimensions. For example, scorable clauses for autonomy are “It’s good to be able to do what I want to do with my time (experiences free choice); I can cope on my own (pride in independence); I was able to keep my temper, I was pleased about that (self-control without loss of self-esteem).” On the opposing subscale scorable examples of Constraint are “The decision has been taken out of my hands (experiences only limited choice); “I have to do what I am told” (inability due to external limitations); “I am helpless” (loss of self-control, impotence). A sample of scorable utterances (raw data from the interview transcripts sectioned into one or more clauses) is reproduced below. The scale weightings used in the scoring are given at Table 13 (below).

| Table 13: CASPM Weightings used in this Study |
|-----------------|-----------------|-----------------|
| Identity        | +6 Versus       | Identity diffusion |
| Affinity        | +5 Versus       | Isolation        |
| Industry        | +4 Versus       | Inferiority      |
| Initiative      | +3 Versus       | Hesitancy        |
| Autonomy        | +2 Versus       | Constraint       |
| Trust           | +1 Versus       | Mistrust         |

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>-6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Scored example:

Subject: Female Youth Gambler

Total Words: 149  Correction Factor: 100/149=0.671

The good and the bad things./ I have to go to work,/ that's bad/

but there's not really anything that's very bad./ The good things

+5  +3  -2
are friends/ and you can go out and meet new people./ This is a hard

question to ask someone,/ Well I've got Terry he's a good thing./

-3
And I don’t know,/ I always wanted to be a vet,/ I like animals and

that sort of stuff/ but nothing ever eventuated from it,/ So I

+4
finished school/ and that was a good thing./ That's about it./ I

usually just go to work/ and come home/ and then get up/ and go

+5
again./ We usually go out of a weekend mainly./ We go and see a

+5
concert/ like last night/ or we go to the movies/ or go to parties/

-2
and things like that. It's a pretty boring life./ That's probably

-3
all I can think of./

Once clauses have been separated and rated the text is scored according to a
formula which allows for variation in the length of the transcript. Total scores are
calculated and transformed with the following formula – where \( f \) = frequency of a
clause with a given rating and $CF = 100 / \text{word count}$. Score = $\sqrt{f \times CF} + \frac{CF}{2}$. Scored transcripts for two sample interviews can be found at Appendix 9, and scorable examples of phrases for each dimension (Viney et al., 1995) can be found at Appendix 10.

With the participant’s consent, responses were recorded. Typed transcripts were prepared for content analysis (Viney & Tych, 1985) by dividing them into clauses, each with an active verb. The transcripts were content analyzed following the standard scoring instructions for each of the content analysis scales (Viney, 1983; Viney et al., 1995; Viney, Henry & Campbell, 2001). Each transcribed clause was compared with the sets of content analysis categories comprising scorable verbal cues for each statement. Clauses matching these verbal cues were summed, and the total score was multiplied by a weight (Table 13, page 142) representing the verbal productivity of each participant. Calculation of the final total score consisted of the square root of the multiplied score, a procedure designed to ensure normality (Viney et al., 2001).

**Reliability**

The content analysis scale methodology has been applied successfully to different populations (e.g. Viney & Tych, 1985; Viney, Benjamin & Preston, 1990; Wang & Viney, 1996) including children as young as six (Gottschalk, 1976). An Australian norm for CASPM has been established from a sample of 813 subjects ranging in age from 6 to 86 years (Viney, 1987). For a comprehensive review of the reliability see Viney, 1983; Wang and Viney 1996 and Wang and Viney, 1997.

Interjudge reliability indicates the consistency with which the standards of the technique were applied by independent raters. The average interjudge reliability for the 16 subscales of CASPM ranged from .80 to .95 (Viney & Tych, 1985), increasing
to .81 to .85 (Viney & Caputi, in press). In the present study 10 out of 34 interviews were rated by an independent, blind rater, achieving a reliability coefficient of alpha = .83. With advances in the methodology, a minimum recommended interjudge reliability coefficient of .85 has been specified (Viney & Caputi, in press). It is noted however that .85 is unlikely to be achievable in some populations. Thus, a coefficient of .83 for the current study indicated good consistency and agreement on scoring.

Validity

The other form of reliability is stability of scores over time, which also attests to validity of the scales. From early work in the 1980s through to present the scales have consistently performed in accordance with expectations. The scales have discriminated people of different health and employment status (Viney & Tych, 1985), Australian and Chinese children and adolescents (Wang & Viney, 1996; Wang & Viney, 1997). In particular, support for their representation of Erikson’s model has come from studies in which group work has been successful in influencing change along dimensions such as industry/affiliation and hesitancy/constraint as well as trust/mistrust (Viney et al., 2001). Further, beliefs about isolation were found to be important predictors of progression, indicating that for troubled adolescents, experiences of loneliness can make change very difficult (Viney & Henry, in press). Successful outcomes of group work has shown that increased beliefs about generativity and initiative together with decreases in beliefs about isolation and constraint has resulted in gains in psychosocial maturity, particularly effective in clients with depression.

In practical terms content analysis scales provide data that is measured continuously with normally distributed scores (Lolas, & Viney, cited in Viney et al., 2001). This method of enquiry overcomes two issues prominent in survey based research. Firstly, biased questionnaire wording, and secondly, detecting ambivalence in respondents’ answers (Wang & Viney, 1997). The key advantage of content analysis using CASPM is that it makes possible an ethical approach to young people insofar
as it enables them to speak about the issues that are important to them. Consequently, Viney et al. (2001) state that the resulting data is less influenced by interviewer characteristics than data collected using other types of measures.

Sample

The sample comprised the same 34 young people described in Study 1\(^1\) (and detailed in Appendix 7). These were 24 males and 10 females, aged 16 to 24 years, who gambled no less often than once per week, and who were recruited either via a snowball sample, or approached whilst actively gambling at one of two large Sydney venues.

Analyses

Group based analysis of contingency and self-regulated gamblers as well as individual analyses were undertaken. Scale scores were calculated for each dimension of the eight bipolar scales, and were examined for group differences. The two scores were then summed to give an overall score for the construct and these scores were also tested for group differences. Analyses of six individual profiles are outlined and CASPM results discussed in relation to the individual's self-regulatory skill. To facilitate comparisons, taking the difference between total scores for all positive and all negative subscales generated an individual ranking for psychosocial maturity.

All analyses conducted were befitting sample size. The two groups established on the basis of limit setting behaviour (contingency regulated gamblers, n=13 and self-regulated gamblers n=21) were subjected to independent sample t-tests to ascertain mean differences across groups, commencing with the demographic variables, age and sex (reported in Chapter 8 following).

\(^1\) As the data collection for Studies 1 and 2 occurred during the same interview, Ethics protocol number 97/120 applied.
Chapter 8: How does psychosocial maturity affect the successful self-regulation of gambling?

Results

Group differences

Demographics

No statistically significant differences occurred between contingency and self-regulated gamblers on demographic variables age or sex.

Resolving stages

Two tailed t-tests were carried out on summed scores for each of the scales to identify differences in frequency of negative and positive utterances. Table 14 (below) provides the means and standard deviations.

Table 14: Mean Scores for Positive and Negative Constructs by Group

<table>
<thead>
<tr>
<th>Group</th>
<th>Polar Constructs</th>
<th>N</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contingency regulated gamblers</td>
<td>Positive</td>
<td>13</td>
<td>7.69 (1.85)</td>
</tr>
<tr>
<td></td>
<td>Negative</td>
<td>13</td>
<td>6.56 (1.87)</td>
</tr>
<tr>
<td>Self-regulated gamblers</td>
<td>Positive</td>
<td>21</td>
<td>8.52 (2.13)</td>
</tr>
<tr>
<td></td>
<td>Negative</td>
<td>21</td>
<td>6.49 (1.16)</td>
</tr>
</tbody>
</table>

There were no significant differences between the two groups on average scores on negative or positive utterances. There were also no statistically significant
differences on positive and negative scale scores between males and females (Figure 4, below).

![Bar chart showing mean positive and negative CASPM scores by sex](image)

**Figure 4:** Mean positive and negative CASPM scores by sex

Figure 5 (page 149) displays the scores for the positive and negative scales of the CASPM. Scores were summed to determine which dimension was most active for each group (most recorded utterances). The dimension purported to occur later in the epigenetic stage theory, Identity/Diffusion, scored below 1.5 showing little or no activity. Such inactivity indicated that respondents were not actively engaged in resolving this CASPM dimension. Consequently, it was omitted from further analyses. The five active dimensions (greatest number of scored utterances, either positive or negative) were Trust/Mistrust, Autonomy/Constraint, Initiative/Hesitancy, Industry/Inferiority and Affinity/Isolation. The self-regulated gamblers scored higher than the contingency regulated gamblers on each of these dimensions with the exception of Initiative/Hesitancy. Mean scores are provided in Table 15 (page 150).
Figure 5: Summed bipolar CASPM constructs

Table 15 (page 150) provides means and standard deviations for summed scale scores of contingency regulated and self-regulated gamblers. The most active constructs for each group were Affinity/Isolation followed by Autonomy/Constraint. This finding suggested that forging close and rewarding relationships, which were experienced as, spontaneous, warm and reciprocal was the most important developmental process occurring for respondents in this sample. The second most active dimension, Autonomy/Constraint (purported to occur earlier in the epigenetic stages) suggested that respondents were grappling with free choice, independence and self-control. The dystonic pole (constraint) represents limited choices, restriction due to external limitations, loss of control and a sense of impotence.

Independent sample t-tests for group differences across scales revealed that groups differed significantly on two dimensions. Contingency regulated gamblers (M = 2.08, SD = 1.00) scored significantly higher, t(32) = 2.23, p<.05, than the self-regulated
gamblers (M = 1.46, SD = .597) on the Initiative/Hesitancy dimension. The resulting positive scores indicated resolution for both groups is in the direction of the positive pole (Initiative). Contingency regulated gamblers were more active in grappling with issues related to being self-activated, self-reliant and establishing a sense of enterprise, and initiative in social situations. The dystonic pole (Hesitancy) represents experiences of not being self-activated, seeing themselves as dependent, lacking initiative and feeling passive in social groups. The self-regulated gamblers scored below 1.5 on this dimension suggesting negligible activity in this area.

Table 15: Means and Standard Deviations for Risk Groups

<table>
<thead>
<tr>
<th>Summed polar construct</th>
<th>Contingency regulated</th>
<th>Self-regulated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N=13</td>
<td>SD</td>
</tr>
<tr>
<td>Identity/Diffusion</td>
<td>1.33</td>
<td>(.83)</td>
</tr>
<tr>
<td>Affinity/Isolation</td>
<td>2.66</td>
<td>(1.08)</td>
</tr>
<tr>
<td>Industry/Inferiority</td>
<td>1.63</td>
<td>*(.70)</td>
</tr>
<tr>
<td>Initiative/Hesitancy</td>
<td>2.08</td>
<td>*(1.00)</td>
</tr>
<tr>
<td>Autonomy/Constraint</td>
<td>2.38</td>
<td>(1.11)</td>
</tr>
<tr>
<td>Trust/Mistrust</td>
<td>1.55</td>
<td>(.38)</td>
</tr>
</tbody>
</table>

*Groups differ significantly at P<.05

Self-regulated gamblers (M = 2.35, SD = 1.00) scored significantly higher, t(32) = 2.25, p<.05, than contingency regulated gamblers (M = 1.63, SD = .699) on the Industry/Inferiority scale. Being actively engaged in this dimension suggested attempts at mastery, seeing the self as productive and accomplishing much. These respondents were engaged in completing work with enjoyment and pride, and knew how to be busy whether alone or with others. The dystonic pole (Inferiority) measured the experience of being unproductive, accomplishing little, and lack of mastery coupled with frustration, disappointment and a sense of inadequacy.
**Negative and positive CASPM constructs**

Analysis was undertaken to determine whether group differences occurred on individual poles of the constructs. Contingency regulated and self-regulated gamblers had significantly different mean scores on the Industry/Inferiority and Initiative/Hesitancy scales. Looking at these dimensions individually, Table 15 (page 150) shows that the greatest difference occurred across the Industry construct. T-tests \( t(32) = -2.40, p<.05 \), revealed that the self-regulated gamblers scored significantly higher \( (M = 1.725, SD = .954) \) than the contingency regulated gamblers \( (M = 1.031, SD = .524) \) on Industry. There were no significant group differences between Initiative and Hesitancy.

**Harms**

The table of correlation coefficients below (Table 16, below) shows the relationships between the number of Harms reported and CASPM scales. There was a significant negative relationship \( (r = -.310, p<.05) \) between Harms and Industry, indicating that the lower scores on Industry were consistent with greater number of reported Harms. There was also a significant and positive relationship between Harms and Hesitancy \( (r = .35, p<.05) \) indicating that the more Harms a respondent reported, the higher their level of Hesitancy in their everyday lives.

<table>
<thead>
<tr>
<th>Table 16: Correlation coefficients for Harms and CASPM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Harms</td>
</tr>
<tr>
<td>-----------------------------------------------------------</td>
</tr>
<tr>
<td>Industry</td>
</tr>
<tr>
<td>-.310</td>
</tr>
<tr>
<td>Inferiority</td>
</tr>
<tr>
<td>.007</td>
</tr>
<tr>
<td>.485</td>
</tr>
<tr>
<td>Initiative</td>
</tr>
<tr>
<td>.112</td>
</tr>
<tr>
<td>.264</td>
</tr>
<tr>
<td>Hesitancy</td>
</tr>
<tr>
<td>* .351</td>
</tr>
<tr>
<td>.021</td>
</tr>
</tbody>
</table>

\*\( p<.05 \)
Further exploratory correlations were run to investigate the relationship of Harms and CASPM scales. Table 17 (below) shows there was a significant negative relationship between Harms and Autonomy ($r = -.334$, $p<.05$) indicating that the greater the number of Harms reported, the lower the level of Autonomy experienced.

<table>
<thead>
<tr>
<th></th>
<th>Harms</th>
<th>Autonomy</th>
<th>Constraint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomy</td>
<td>-.334</td>
<td></td>
<td>.027</td>
</tr>
<tr>
<td>Constraint</td>
<td>.151</td>
<td>.101</td>
<td>.285</td>
</tr>
<tr>
<td></td>
<td>.196</td>
<td>.281</td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>-.320</td>
<td>.156</td>
<td>.188</td>
</tr>
<tr>
<td></td>
<td>.032</td>
<td>.054</td>
<td>.188</td>
</tr>
</tbody>
</table>

*p<.05

These findings were as anticipated. The CASPM scales were directly related to limit setting ability because they measure skills that underpin the capacity to set, monitor and maintain limits. The relationship between CASPM and Harms further underscores that contingency regulated gamblers have developmental deficits which are associated with the higher levels of harm they reported.

**Individual profiles**

The preceding group based results demonstrated significant differences in psychosocial maturity between contingency regulated and self-regulated gamblers, but no significant differences in sex or age. The following section focuses on the constructs for which significant group based differences occurred and profiles individuals with large margins between positive and negative scales. Scoring high on the positive pole, and low on the negative pole is a clear indication of favourable resolution of a stage. Of all 34 interviewees, the six respondents profiled in Table 18 (page 153) had the greatest margin between scores on Industry/Inferiority and
Autonomy/Constraint respectively. There were however, no respondents with the Inferiority subscale dominating.

Table 18: Highest and Lowest Scores on Subscales where Significant Group Differences Occurred

<table>
<thead>
<tr>
<th>Positive Subscales (Highest Scores)</th>
<th>Negative Subscales (Highest Scores)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td>Initiative</td>
</tr>
<tr>
<td>Contingency regulated gamblers</td>
<td>Tony</td>
</tr>
<tr>
<td>Self-regulated gamblers</td>
<td>Peter</td>
</tr>
</tbody>
</table>

*No respondents had the inferiority subscale dominating

**Contingency regulated gamblers**

**Julie**

Initiative

Julie achieved the highest score on Initiative, as well as the widest margin between scores on Initiative and Hesitancy. Julie presents as a mature and confident women who said she was not concerned about her level of gambling. She was included in the contingency regulated gamblers because she constantly revised limits and ended a session only after spending all her money.

Julie is 24 and is not in a committed relationship. She is a university graduate working as a residential services worker, earning between $770 and $864 per week. She lives alone in Wollongong. Julie explains that the best thing about gambling is winning money, but she really enjoys the social side, sitting and having a beer and a gossip with friends while playing the machines. For Julie gambling is fun. She admits that it may not be such a positive thing to be spending so much time in a pub, and recalls it was her brother who first took her to the pub and taught her to play the card machines. Julie says for her the ritual to playing machines is just to have a beer and a smoke at the same time. She talks about sitting at poker machines 'focussed in that stupid gambling mind set' and just playing and playing and playing.... She says it is really stupid [gambling]. She feels pretty ashamed that she can sit at the machines on her own and blow $60 in half an hour.
Julie is self-activated with a sense of enterprise, her interview text showed that she enjoyed challenges in her work and was striving to achieve. Julie gave no indication that gambling was jeopardising her career. She saw herself as having a sufficient income to sustain the relatively small amount she outlays on her preferred form (card machines).

Utterances and scores

Julie’s CASPM profile shows relatively high scores on the positive scales. The two exceptions were Affinity which was not active (scored less than .5) and Autonomy. Constraint dominated in Julies profile. The phrases scored in Julie’s interview demonstrated that in some area(s) of life she does not experience free choice in her behaviours. Rather she experiences herself as having only limited choices and experiences a loss of self-control. Her full interview contains no mention of specific life circumstances in which she experiences constraint or loss of control.

Manifestations of developmental stages in gambling behaviour

The unsatisfactory resolution of the Autonomy/Constraint construct is consistent with her style of setting gambling limits in which she constantly revised limits but failed to meet them. By gambling until all her money was gone, the decision regarding when to finish a session was effectively averted. Thus, two of the underlying themes comprising constraint were present: she felt that her choices were restricted and she felt a loss of control. In Julie’s case, there appeared to be a reciprocal relationship between gambling and the unsatisfactory resolution of the Autonomy subscale.

Erikson has argued that each successive psychosocial stage is built upon the resolution of foregoing stages. If this is indeed true, Julie, while showing high Initiative in her working life, may be disadvantaged by her low Autonomy score. For example, her diminished sense of Autonomy may make her reluctant to accept promotion or assume control. Without any other specific life circumstances that link to the low Autonomy score, it is reasonable to conclude that loss of control in gambling is the foremost factor. Thus, the impaired control Julie experiences with
gambling appears likely to have a generalised affect, with the potential to cause problems where none existed before (Productivity Commission, 1999).

Julie’s CASPM profile shows that her psychosocial maturity is generally well oriented towards satisfactory resolution of stages. As her experience of gambling related Harms is mild relative to other respondents, Julie would be unlikely to present at a counselling service with gambling problems.

**Psychosocial maturity ranking**

Julie’s psychosocial maturity ranking was +2.80 comparing favourably to the average ranking of +1.680 (median +1.660). This was 11th in the psychosocial maturity ranking.

**Joseph**

**Hesitancy**

Twenty-three year old Joseph had a high score on Hesitancy. Commonly, when Joseph went to a venue he would spend all his money on gaming machines in an attempt to win more money. When talking about how he ceased a gambling session, Joseph said:

"... the initial way would be to lose the money because then you've got no choice."

Joseph is a 22 year old father, who had separated from his de facto partner. He lives at home with his parents in Guildford and has his children for access visits. Joseph completed year 10 and is currently unemployed. He speaks Arabic and says that gambling brings him some relief from tension. Sometimes when he feels run down and let down, he will spend $250 of his $320 dole cheque in half an hour at the poker machines. He had a driver's license but received some infringement fines, and instead of paying them off, gambled with the money. Subsequently his license was revoked. Joseph would like to have some assets and be living in a mansion by the time he is 30, but says gambling severely jeopardises his goals because he gambles with no mercy he just doesn't stand a chance. Joseph comes across as being very angry with himself for not controlling his gambling. In hindsight he wishes he had done other things, such as ten-pin bowling, instead of going to the club.
Utterances and scores

Joseph’s scored utterances on Hesitancy included comments such as:

“I’m at a stage in my life where I don’t know, there’s so much confusion”

and

“I sorta can’t bring myself to do it [find employment]”.

Joseph’s high scores on Hesitancy indicated he felt himself lacking in initiative and did not feel self-activated. His frustration with himself was very evident throughout his interview – particularly in relation to his children. He was frustrated that he could not motivate himself to get a job and provide for his children.

“... I am ashamed to say it but it's only because of mum and dad you know. Because it's not often that I even pitch in for rent and dad is always grocery shopping you know ...”

Joseph felt powerless to change his living situation just as he felt powerless to control his gambling. Joseph went on to say that:

“... you sort of know beforehand - you know you're going to have a lose, ...”

He did however, continue to gamble. Joseph estimated his chances of achieving anything in life as very limited, and admitted to being confused about how his life had turned out as it did. Reflecting on his life circumstances, Joseph said

“... through no fault of anyone’s but my own, I must say because it’s a willpower sort of thing, you know, it [gambling] has sorta contributed heaps to like my surroundings, you know.”
Manifestations of developmental stages in gambling behaviour

Joseph's scores on each of the positive subscales were below 0.5, indicating little or no activity. Scores on the negative subscales Isolation, Hesitancy and Constraint were high, ranging from 1.14 to 1.78. His CASPM profile indicates that resolution of developmental stages has been most unsatisfactory. At this time in his life his psychosocial maturity is not sufficiently developed to support his efforts to gain control of gambling. His interview bears testimony to the CASPM results, where he repeatedly expresses a) inferiority, doubting his ability to achieve; b) Hesitancy, being dependent and lacking initiative to change; c) Constraint, feeling unable to change due to external limitations and loss of self-control. A sense of pessimism pervades (Mistrust) in that he expects little from life.

Joseph attributes to gambling a role in creating his current circumstances. Although his pre-existing difficulties have been exacerbated by continual gambling losses, it is apparent from interview that his psychosocial skills were underdeveloped prior to his gambling problem. Joseph is a respondent in need of counselling but would be unlikely to present to a service. As with the majority of contingency regulated gamblers, he believes he must solve his problems alone.

Psychosocial maturity ranking

Joseph's individual psychosocial maturity ranking was -5.96, the lowest of all respondents, and his gambling problems amongst the most severe.
Tony

Industry

Amongst the contingency regulated gamblers Tony had the largest margin between positive and negative scores, with Industry dominating. Tony was one of the BL group who were entrepreneurial in their approach to gambling. They tolerated large losses as a strategy to win big.

Tony was 22 at the time of interview and living with his parents. He had deferred from university to work as a bank loans officer, earning in excess of $674 per week. Tony had a steady girlfriend and also spoke a second language (Yugoslav). Tony's life was unstable because of a gambling problem. He had been gambling for four years and struggling with constant debts during that time (up to $80,000). He described a life of dodging debt and conjuring money - through hocking possessions and deceiving friends into giving him money.

Utterances and scores

All of Tony's negative subscale scores were relatively low with the exception of Constraint. Scores on the positive scales were relatively high with the exception of Initiative and Autonomy, which were below 0.5, indicating no activity. Tony's utterances in relation to Industry were about his enjoyment and pride in his job and his experience of work completion.

Resolution of stages

The following excerpt from the interview text demonstrates the impact gambling has had on Tony's Industriousness:

"... I started off in uni and that and they [parents] saw me going into some sort of a degree whether it was law or whatever. From then everything just crashed, I deferred from uni and I lost my job."

He recalls being at the casino until 3 a.m. and not sleeping, and going to work pale and drawn at 8 a.m. Tony was fired from his job when the company found out about
his gambling problem. He assumed the bank wanted responsible people talking to customers about their finances:

“… it really shocked a lot of people when they found out. I was thrown out of my job because of gambling. They [staff] were looking up my bank accounts and it wasn’t staff policy, you know, they really wanted to have people there who were responsible with their own money before talking to customers about being responsible with their money, even though I did a great job.”

Throughout the interview, Tony cited numerous examples of his noteworthy capacity for Industriousness, but as with events described above and below, his gambling compromised his earlier experiences of himself as Industrious:

“I had been working hard and I saved up and I bought myself a beautiful car. A Commodore VS which is a thirty thousand dollar car and paid it outright about four years ago when I was eighteen or nineteen because I had saved all my life. And ever since I started gambling, slowly I had to refinance, I had to beg my parents for money to bail me out and to this day my car is still secured, I am still paying my car off. It is on a loan.”

Tony’s resolution of the CASPM stages is somewhat irregular. He has relatively high scores on Affinity and Industry, and on the negative poles, a relatively high score on Constraint, with no activity on Autonomy. Tony mentioned throughout his interview how his family and his girlfriend have become very important to him. That through his gambling he came close to losing them and realised how important they were in his life – possibly explaining his current high score on Affinity. His low score on Autonomy is consistent with being unable to set and apply limits to his gambling, and relying on his parents to control the money he takes to the casino. Despite the fact
that he claims to be reformed, Tony is still unable to independently set and meet limits.

Tony has sought counselling, but still thinks that one day he will ‘win big’. Tony believed he was over the worst of his gambling problem and aimed to work towards a career and family.

Manifestations of developmental stages in gambling behaviour

The strength of Tony’s relationships coupled with his drive and ambition suggest he may possess the qualities that will enable him to move through his gambling problem. The worrying aspect of Tony’s profile is his resolution of the Autonomy/Constraint dimension which is very strongly towards the negative – this is borne out by comments through his interview such as:

“I say to my mum ‘look I am going [to the casino] mum and I am going to take fifty bucks with me or a hundred bucks. She will say that is fine and she will take all my keycards, I will give them to her anyway…”

Tony has relied on an external means of regulation at the expense of developing self-control.

Tony is one of several in the sample whose gambling problems have been long enduring and whose psychosocial maturity profile indicates that freeing himself from gambling and developing the skills to overcome the need for external help may be extremely difficult. For his mother’s intervention to be useful to Tony, he must be able to develop and accept self-responsibility, just as his mother must allow him sufficient latitude to (re)establish his sense of Initiative and Autonomy.
Psychosocial maturity ranking

From this profile Tony would be classified as still at risk of problem gambling. He is ranked at 1.90, making him slightly above the average ranking of +1.680 (median +1.660) and placing him 15th in ascending order of psychosocial maturity.

**Self-regulated gamblers**

**Jean**

Initiative

Jean had the highest margin between the Initiative and Hesitancy constructs with Initiative dominating. Jean was included in the self-regulated gamblers because she set and maintained limits to her gambling. She said:

Jean was 21 and single and lives with friends in North Manley. She is a university graduate and is currently unemployed. She would like to find a job working with children and eventually be a mother herself. Jean has been to gambling sites on the internet where she played the free spin wheels, but has never gone as far as giving her credit card details. She prefers to play card machines and recently got a royal flush paying $120. Jean says of gambling it is just a game, and she likes the chance to win. She gambles with her dad because it is a way for them to bond, as her dad isn’t a very good talker. They just hang out and her dad will suggest putting ten dollars in the machine. Jean says it’s because doesn’t know how to hang out and chat, so playing the machines together is a way to spend time together. Jean can’t imagine what she would do if she didn’t gamble because from a young age her family played cards for money. She says “I have always gambled in some form”.

“I just feel I intuitively do it [stick to my limits] I don’t have any rules, I just go by intuition at the time.”

Jean recalls advice from her father not to “throw good money after bad” and consequently she says she never puts in more than she can afford to lose. Her definite limits to the amount she will outlay in a single night were stated clearly:

“Like each time I would choose either ten or twenty dollars and I would not spend more than that.”

161
At the time of interview, Jean was 21, single, an unemployed university graduate and sharing a house with friends. Her preference was for card machines and she had recently got a royal flush paying $120. Jean says she has had a long history of gambling:

“.. ever since I was a kid we played cards at home, if it wasn’t with money it was like with toothpicks or you know something. I have always gambled in some form.”

She gambled mostly with her Father because it was a way for them to bond - she says her Father isn’t a very good talker. Jean says playing the machines is a way for them to spend time together – it is an agreement between them:

“Before I go out at nights I know I will gamble, my dad and I will say, oh you know when you come and pick me up from the club we will put a couple of dollars in the machines or something like that.”

Jean was gratified that although communication with her father is difficult, they can at least spend some time together doing something. Jean has found a way to create some sort of intimacy with her Father, and the skills she has used to do so are reflected in her high score on Affinity.

Utterances and scores

Jean’s utterances about initiative centred on travelling and working overseas.

Manifestations of developmental stages in gambling behaviour

Jean’s CASPM profile showed active scores on all the five positive CASPM constructs. However, the Constraint Subscale was higher than Autonomy. Jean’s utterances about Constraint were about the financial difficulties she faced which meant she could not buy a car, or travel overseas again for some time.
Psychosocial maturity ranking

Jean has the ninth highest CASPM ranking in the sample (3.28) indicating that she was successful in moving towards a satisfactory resolution of the psychosocial stages. Accordingly she showed evidence of stable gambling behaviour consistent with the maturity to set limits and apply limits. She reported minimal experiences of Harms as a result of her gambling.

Belinda

Hesitancy

Belinda had the widest margin between the subscales Initiative and Hesitancy, with the latter predominating. At the time of interview Belinda was 21 and single.

Utterances and scores

Belinda said she was not good at talking about herself and accordingly her CASPM interview was amongst the briefest. She was one of the self-regulated gamblers who ceased gambling after once revising her initial money limit. Belinda had relatively high scores on Industry, Autonomy and Trust to balance her high scores on Hesitancy and Isolation. The high scores on the positive poles suggest she had a well developed sense of who she was and possessed the capacity for self-control – the latter in particular borne out by her interview. She stated that if she spent more than she planned she would stop gambling:

"...like I have a set amount like about five dollars or so and if you lose that then you don't play any more. I would never put in too much money before I lost it all."

Belinda is 21 and single. She graduated from university and is now a nurse earning $578-$673 per week. She lives with relatives in Blacktown. Belinda wants her life to contain a good job, money, and a boyfriend who is rich and handsome. Belinda is from country NSW originally, and says she would like to be an only child so that her parents were rich, rather than one of nine. Her favourite form of gambling is on 1 and 2 cent poker machines, which she says are fun.
Belinda is a typical Low Risk gambler with definite opinions about the role and extent of gambling in her life, and had the psychosocial maturity to behave according to her values.

Manifestations of developmental stages in gambling behaviour

Belinda’s current sense of Isolation was related to a family rift, but even coupled with her high score on Hesitancy, her psychosocial profile indicated underlying satisfactory levels of Trust and Autonomy. If her gambling did escalate, the extent of her sense of isolation from people may prevent her from reaching out to get help, thus intensifying the experience of Harms.

Psychosocial maturity ranking

Belinda’s psychosocial maturity ranking was 1.560 just below the average ranked score of 1.680. This score ranked her 18th amongst a sample of 34.

**Peter**

Industry

Amongst the self-regulated gamblers Peter had the widest margin between scores on the positive and negative poles, with Industry dominating. Notably, his score on Industry was more than double all other contingency regulated respondents.

Utterances and scores

Peter’s orientation towards achieving his work goals demonstrated his capacity for planning for the future through his career. His experience of work completion and enjoyment and pride in his work was marked. For example, Peter said:

“I always wanted to do policing and they changed the entry requirement and that’s when I had to go to uni and do the Diploma of Policing. I started the Diploma of Policing in May of this year, so hopefully I’ll finish that in March and come out as a Probationary Constable.”
Throughout his interview Peter mentioned only one instance in which gambling interfered with his life.

“It does take up a bit of time, with study yes, I guess it can have an effect on it, which is bad. I think time consuming more than the monetary aspect of it. Because once I’m here I’m here for a while.”

His comment indicated that he is very much a regular gambler but his Industriousness, demonstrated via his commitment to his career, does not suffer as a result.

Manifestations of developmental stages in gambling behaviour

Peter’s CASPM profile shows high scores on all five positive constructs, Affinity, Industry, Initiative, Autonomy and Trust. At this time Peter’s gambling is stable. He is able to set and apply limits, experiences very minimal Harms and possesses the psychosocial resources to sustain him should his gambling escalate.

Psychosocial maturity ranking

His ranking of 5.39 is fifth highest of all respondents and as such he is an unlikely candidate for problem gambling.

Peter is 21 and lives with his parents. He has completed 2 TAFE courses and is currently doing a diploma of policing at university. He works part-time as a customer service representative, earning between $482 and $577 per week. Peter says he has met some very nice people at gambling venues and he sees them there from time to time, although they have never become outside friends. There have been times when he hasn’t had enough money to buy things like shoes, and pay the telephone bill because he has been short of money. Peter says gambling is problematic sometimes; it uses up his time and can have an effect on study, which is bad. He thinks it is time consuming more so than a financial burden, because once he goes gambling he is there to stay for a while. Peter prefers to play table games at the casino such as Blackjack and Caribbean Stud and expanded at length on his strategies not so much to win, but to relieve the dealer of all possible advantages.

Later in the interview Peter told us that time doesn’t have much to do with his gambling. He leaves the table when he has either won or lost all he can afford. He says that after he has lost he walks out asking himself “how stupid am I”, but there is always that other side thinking that he could have won. Peter says if he wasn’t gambling he would join a sporting club and get motivated, or perhaps go to the movies.
**Discussion**

The preceding results section detailed a clear relationship between CASPM scores and self-regulatory skill, and between CASPM scores and reported Harms. Successful resolution of stages was related to successful self-regulation and to fewer reported Harms. Contingency regulated gamblers scored significantly lower on psychosocial maturity generally, and lower scores on psychosocial maturity were also related to increased incidence of Harms. Significant differences also occurred in the Initiative/Hesitancy and Industry/Inferiority scales.

Profiles of individual high scorers were accompanied by explanations of how developmental deficits manifested in gambling behaviour. It was demonstrated that impaired control arose due to pre-existing deficits in psychosocial maturity, and that impaired control may generalise from gambling to other areas of life. The profiles contained a subsection entitled “Manifestations of developmental stages in gambling behaviour” in which the unique behavioural patterns of respondents was linked into the Eriksonian theory underlying the CASPM.

**CASPM subscales**

*Most active construct - Affinity and Isolation*

Respondents in this sample were actively engaged in resolving the tension between Affinity and Isolation. Affinity and Isolation are constructs which measure the level of attraction to others and whether one enjoys oneself in the company of others.

Earlier in the development of the LMM (Chapter 6) it was noted that more than half the sample reported difficulties with relationships. The majority of contingency regulated gamblers were experiencing conflict in a relationship expressly because of gambling. Problems arose between girlfriends and boyfriends, but were particularly intensified when involving parents.
Moving toward positive resolution of Affinity/Isolation is crucial to developing sustainable and supportive relationships. Interpersonal skill at this time of life determines whether we form good quality support networks of friends and develop intimate relationships. Respondents who reported good quality relationships with parents were much less likely to be experiencing difficulties controlling gambling. Whilst it is premature to surmise that gambling alone could lead to a negative resolution of this stage, it is the case that impaired control of gambling severely disrupts the ability to manage intimate relationships. Interruptions or delays in developing relational skill have consequences in the immediate future, and potentially throughout the lifespan. This issue is particularly important if we wish to ensure youth avoid one of the defining characteristics of the adult problem gambler - gambling in isolation.

**Second most active construct – Autonomy and Constraint**

Autonomy is apparent when a sense of free choice occurs along with pride in one's own independence. Decision-making, and self-control without loss of self-esteem are core characteristics of Autonomy. Autonomy and Constraint were the second most active of the five poles. Respondents were grappling with issues related to independence, free choice and self-control. Autonomy scores of self-regulated gamblers were approximately double those of contingency regulated gamblers. Thus, low Autonomy scores were generally consistent with failing to set and apply limits.

The key construct of Autonomy is “I am what I want to be”. Tragically, the BL group (upper seven of the contingency regulated gamblers) wanted to be seen as winners. Their ideals diverged from their reality sharply, and they reported a loss of self-esteem. They were caught between not being able to win and believing they did not have the skill to limit their gambling behaviour.
The desire to elevate self-esteem through gambling derived status (Abt, McGurrin & Smith, 1984; Fisher, 1993; Griffiths, 1991) manifested in the BL group as wanting to be seen as a ‘winner’. These youth imagined themselves to be richer and more powerful than they really were, paralleling the finding that they felt as though they had failed to meet their parents’ educational or career expectations of them. Having lower levels of Autonomy to achieve their imagined selves made gambling an attractive alternative for them. Gambling provided a level playing field when skill deficits made it difficult to achieve in other areas of life. Thus, gambling had the potential to elevate their flagging self-esteem and/or bolster their inflated self-image.

When Autonomy is underdeveloped, particularly for a youthful cohort, the result is likely to be detrimental to attempting and resolving other developmental stages. Completing education and building careers requires a high level of Autonomy, and when Autonomy is underdeveloped and impaired control of gambling is added to the mix, the adverse affects are multiplied. Respondents whose self-concept was dominated by Constraint felt their choices in life were limited. For example, they had no alternative but to spend all their money on gambling.

**Significant group differences – Initiative and Hesitancy**

The key construct for Initiative is “I am what I can imagine myself to be”. For Hesitancy, it is “I don’t know if I can be what I can imagine myself to be”. The first statement is an expression of personal power, typified by reports of a sense of self-activation, self-reliance, enterprise, and social competence, and as such could be expected to be based on existing skills, and realistic self-expectations. The contingency regulated gamblers scored significantly higher than the self-regulated gamblers on Initiative, coinciding with their entrepreneurial nature.

The entrepreneurial nature of the contingency regulated gamblers was demonstrated through their strategic attempts to make money by gambling. Their strategies included discussion of how to beat the odds, or disadvantage dealers, for example,
and most particularly they nominated a minimum amount they wanted to win rather than setting spend limits.

Whilst the group's income initiatives were admirable, their skills were misapplied to gambling. Although card games and table games comprise an element of skill, it is generally agreed that they contain a high degree of chance and are not a reliable source of income. On the occasions when they did win, it simply reinforced the possibility (however remote) of quick money. Winning at gambling cannot induce positive emotions such as pride in achievement, because it is not wholly attributable to skill. Therefore it cannot build the psychosocial qualities upon which further development can occur. Rather it may provide a false sense of achievement amongst young people who are often struggling to develop Autonomy or Industry, for example. This is particularly detrimental when, as in the case of the BL group, effort and perseverance are diverted away from education and career, and channelled into gambling.

**Significant group differences - Industry and Inferiority**

A sense of Industry is said to follow only after Autonomy has been resolved. The key construct of Industry is: "I am what I can achieve". Industry involves mastery of tasks and problems by reflection, seeing oneself as productive, carrying work to completion and enjoying it. A sense of Industry is reflected in people's reports that they know how to be busy, whether they are alone or with others. When people have a sense of inferiority, on the other hand, they believe "I will never be any good". They lack a sense of mastery and see themselves as unproductive and inadequate. They report frustration in uncompleted work and do not enjoy the work they do.

It is noteworthy that the self-regulated gamblers had a significantly higher score on Industry than the contingency regulated gamblers. The industriousness of the self-

---

2 Skilled card playing may do so, but generally society does not acknowledge gambling as an acceptable means of earning an income.
regulated gamblers, in which they experienced themselves as productive and achieving mastery is a core quality that aligns with intrinsically motivated behavioural control that is antithetical to problem gambling. That is to say, self-regulated gamblers were good at, and enjoyed doing other things. Contingency regulated gamblers had very little faith in their ability to achieve in any area, but had a greater imagination to see themselves as 'winners'.

**Methodology evaluation**

There were two key advantages gained from the CASPM methodology. Firstly, it made possible an ethical approach to interviewing young people insofar as it enabled them to speak freely about the issues that were important to them, such that the construing of the interviewee, rather than the interviewer, was foremost. Secondly, the inclusion of positive scales in the CASPM meant that it tapped the individual strengths and resources youth possessed, thereby facilitating the development of helpful interventions (Viney et al., 2001).

As a group the scores on the subscales differed between contingency regulated and self-regulated gamblers. However, the CASPM scales were most effective when used to clinically profile individual gamblers. It enabled examination of detail and patterns unavailable to the researcher using methods that force scores towards averages. Where psychosocial maturity was poorly resolved, behavioural patterns were mapped to provide a comprehensive explanation of how poor psychosocial skills jeopardised self-regulation of gambling.

If the findings from the present study can be replicated, and if the CASPM performs in accordance with research findings relating to recidivism amongst adolescent offenders (Viney et al., 2001) it may prove to be a useful intervention for group work with youth who are unable to maintain their gambling limits. Whilst young gamblers are not, albeit in very few cases, committing crimes, there are similarities between gamblers and offenders. Behaviourally, both share difficulties with control, resulting
in personal and social sanctions. Psychologically, the constructs which gamblers and offenders hold are problematic (e.g. gambling as a means of deriving income versus stealing as a means of deriving income) and they may benefit from an intervention in which the validating climate generated by peers, can provide new insights without threatening their core constructs (Vinay et al., 2001).

**Implications for sustainable gambling**

The substantive finding from this chapter is that control based on consistent and positive psychosocial maturity was successful, even when the respondent was a regular gambler. Generally higher scores on psychosocial constructs, combined with the ability to set and maintain limits were indicative of a stable and manageable gambling pattern.

The skills associated with self-control are located within the Autonomy developmental phase. However, it is apparent that setting and maintaining limits requires more than the ability to act autonomously. Limit setting requires an intrinsically motivated reason to apply and maintain control, and the cognitive and emotional resources to sustain it. Intrinsically motivated reasons for control were consistent with higher levels of psychosocial maturity.

Being unable to control gambling by any means other than an external contingency affected respondents' negatively because their sense of self-efficacy in the control process was diminished. This detrimental effect made them more susceptible to limit setting failure, setting up a cycle whereby the experience of gambling related Harms increased the likelihood of impaired control (Corless & Dickerson, 1989). In studies of this nature, it is impossible to substantiate comments regarding the direction of causality. With extensive knowledge of the interviews, the author concluded that for contingency regulated gamblers, failing at control had an insidiously generalised effect throughout their lives. For example, contingency regulated gamblers were less adept at dealing with their emotional states, an outcome supported by findings from a
study of adolescent offenders in which ability to cope with negative emotional states was influenced by their level of psychosocial maturity (Erikson, 1959; Viney & Henry, in press).

It is likely that gambling exacerbates an underlying vulnerability (with few if any visible signs) and thereby creates problems where none existed previously (Productivity Commission, 1999). Under normal circumstances a psychosocial vulnerability will be resolved over time and usually without such harmful consequences as the gambling ‘crisis’ generates. If accumulation of psychosocial skill must occur as a result of a gambling crisis, the ensuing Harms will be more severe, extracting a high price for gaining psychological and social maturity.

At the very least, psychosocial maturity is a safety factor. Resolving psychosocial skills positively did not entirely prevent gambling problems, it did however buffer the severity of the problem and would be likely to facilitate a speedy recovery with a relatively intact sense of self. For this reason, interventions specifically designed for young gamblers should identify inadequate psychosocial development and target the skills necessary to support positive resolution of psychosocial stages. Interventions designed in this way would be likely to improve goal setting and limit maintenance.

In Australia access to adult gambling venues appears to be occurring at around the age of 16 and onwards (Maddern, 1996). The majority of youth gain access to venues at 18 years of age, and their exposure to the full range of gambling products therefore coincides with some major life transitions. When transitions from parental and financial dependence to independence are occurring, the integration of developmental skills may be blocked (Viney et al., 1999). Delays in integrating developmental skills will impact upon how successfully gambling is managed. This is startling speculation when one considers that it is not until the late 30s that we start to see a fall-off in gambling participation rates (Dickerson et al., 1995).
Considering the findings from Chapters 5 through to 8, there are two components necessary to distinguish the degree of risk of gambling problems faced by youth. The first is the cognitive skills associated with goal setting and planning (Chapter 5) and the self-management of emotions (Chapter 6), making it important that youth problem gambling be seen in the broader context of their social and psychological development. Thus, the second component is psychosocial maturity (Chapters 7 and 8), which encapsulates the emotional and social learning that supports or undermines the cognitive skills. Each component interacts and is important if regular players are to maintain their gambling at a sustainable level. Consequently, Chapters 7 and 8 have established the importance of extending the evaluation of risk for youth aged 16 to 24 years to include a developmental perspective, rather than relying on research findings from adult samples.
Chapter 9: Temptation and Restraint in gambling

Introduction

Summary of Chapters 5 through 8

The principal aim of this thesis was to identify how some youth manage to gamble regularly without the activity giving rise to excessive gambling related Harms. Study 1 (Chapter 5) established that youth set financial limits for their gambling sessions. There were five styles of limit setting and together these generated a model of the limit setting process (The LMM). The five styles (BL, RL, SRL, TL and NSL) had distinct characteristics which explained why limits were maintained or relinquished. Those who were successful in maintaining a limit were deemed self-regulated (SRL, TL and NSL) and those who were unsuccessful were deemed contingency regulated (BL and RL) because a session ended only when all funds had been expended. A key finding relating to the NSL group was that contrary to common belief, some self-regulated gamblers do not consciously set limits but recognise a limit once it is reached. The absence of the need to set limits was explained by the process of dynamic self-regulation (Pintrich, 2000) in which intrinsically motivated values consistent with other activities over-ride the desire to continue gambling. The inability to adhere to a limit (BL and RL) was explained firstly in self-regulatory terms as reliance on external structures to force the end of a session, and subsequently in reference to the Limit Violation Effect (Collins, Lapp, & Izzo, 1994). The LVE posits that two key factors interact to hinder the limit setting process. Firstly, cognitive preoccupation with maintaining control, and secondly dysphoric mood arising from self-blame for failures of control.

3 All Harm items are listed in Table 25 on page 223.
In Chapter 6, The LMM was validated against the Harms reported by respondents. The Harm items operationalised in the present study were constructed from the in-depth descriptions provided by interviewees, and outlined in Study 1. Responses to Harm items on a scale of 1 = not associated and 9 = strongly associated provided a composite variable to assess the degree of harm that youths associated with their gambling. Self-regulated gamblers reported fewer than three Harms associated with their gambling, and contingency regulated gamblers reported three or more Harms. Assigning high and low risk status to contingency regulated and self-regulated groups respectively was therefore done on the basis of their control behaviours, and was independently supported by the Harms they experienced.

Because the LMM evolved from a self-regulatory perspective, the substantial worth of a developmental approach to youth gambling was apparent. Successful self-regulation was shown to be associated with cognitive skill as well as with the capacity for emotional self-management. Interviewees openly discussed their difficulties, in which developmental themes relating to autonomy and self-regulation were defined. Personal and financial independence, skills instilled through the developmental transition from parental authority, were of foremost concern for interviewees. Consequently the capacity for self-control was measured by the psychosocial maturity scales (CASPM; Viney, 1983; Viney & Tych, 1985). The CASPM (Chapters 7 and 8) was chosen for several methodological and conceptual reasons – not the least because the Eriksonian theory underlying the CASPM was theoretically sound and could identify youths’ strengths and weaknesses. It was intended that such a developmental approach would identify the existing skill base from which to improve resilience to any problems gambling may create as well as providing valuable information about the skills needed to arrest contingency regulated gambling. Detailed profiles were provided arguing the relationship between psychosocial skills and gambling behaviours. Chapters 7 and 8 thereby provided evidence for the need
to research youth gambling in a developmental context so as to provide the best possible information on which to base intervention programmes.

In summary, the LMM evolved through a qualitative process, and highlighted two major themes requiring further investigation. The developmental themes around psychosocial maturity were investigated in Chapters 5 and 6 on content analysis (quantitative methodology) and the interplay of cognition and emotion that was the catalyst for the limit setting failure of contingency regulated gamblers was further tested in a strong quantitative model in chapters 9 and 10 (following).

**Rationale**

The thoughts and emotions that generate control behaviours are complex, inter-related and hold the key for a rich understanding of what motivates youth to gamble.

A study of this scope required a theoretical framework which accounted for the range of personal, financial and work-related consequences without relying on them as a defining measure. The inclusion of gambling as an addictive behaviour has opened the research field to a diverse range of constructs, assuming common pathways to the misuse of addictive substances (Collins, 1992).

One such pathway is Restraint. The Restraint concept has been extensively researched across the addictive behaviours, particularly in alcohol studies. Restraint is said to be operating amongst people who attempt, but fail, to limit their alcohol consumption, resulting in maladaptive drinking patterns (Ruderman & McKirnan, 1984). A broad review of the addictions literature resulted in the decision to focus on drinking Restraint and to explore generalising the construct to youth gambling.

**Origins**

The Restraint concept originated in the field of eating disorders, (Herman & Mack, 1975) where it was introduced as a construct accounting for differences in the eating
behaviours of obese people and dieters. It was first developed to describe maladaptive eating patterns of dieters who attempt to limit their food intake (Herman & Polivy, 1980; Polivy & Herman, 1985; Ruderman, 1986), but who failed to do so and subsequently indulged to excess.

It has been argued that restrained dieters and drinkers are comparable because both are cognitively and behaviourally preoccupied with controlling their intake (Collins, 1992). Restrained drinkers are individuals who have an inordinate interest in, or pay attention to controlling alcohol consumption. Such preoccupation with control is evident in the rules individuals invoke to set limits and regulate intake. When these rules are unsuccessful and the individual yields to temptation, (consumes alcohol, for example), the failure to regulate results in episodes of excessive drinking (Collins & Lapp, 1991; Curry, Southwick & Steele, 1987; Ruderman & McKim, 1984) thus initiating a cycle of restrictive behaviour followed by binges or splurges.

The controversy of whether measures of restraint should only access Restriction (regulation of behaviour), or whether they should access disinhibition (i.e. yielding to temptation by temporarily suspending Restriction) occurred in the addictions field some 10 years ago. Measures of restrained eating (The Restraint Scale; Herman & Mack, 1975) were already using bifactorial structures to represent the Restriction and disinhibition of intake (Collins, 1992). The argument was that Restrainment was a multifaceted syndrome, and that in attempting Restrainment individuals experienced occurrences of successful regulation as well as moments of temptation resulting in a splurge. This idea was taken up in alcohol studies (Collins & Lapp, 1992) where the tendency to splurge was argued to be inherent in restrictive behaviours; that the one would be likely to invoke the other.

Restrictive behaviour followed by disinhibitory behaviour was first described as the Abstinence Violation Effect (AVE) by Marlatt and Gordon (1980). The AVE is said to occur when an individual decides to limit their consumption of a substance, but then
lapses by using or overusing the substance. The AVE proposes that cognitive preoccupation with maintaining control over substance use is implicated in the cycle of abstinence and binging that is observable in substance abuse. During the 1990s a number of studies were undertaken to test whether the AVE could be validated. In the intervening years the AVE gained a well-established theoretical background and provided the basis for research aimed at validating a scale for predicting frequency and consequences of alcohol use.

Part of the theoretical background of the AVE has been its links to attributional style. Collins and Lapp, (1991) tested attributional style because of its relationship to depression (Peterson & Seligman, 1984), which was associated with relapse in smoking cessation (Curry, Southwick & Steele, 1987). Internal, stable and global attributional style was hypothesized to make an individual likely to experience a more intense AVE when the lapse is perceived as a generalised failure, (e.g. lack of willpower; Marlatt & Gordon, 1980). This generalised sense of failure reduces the individual's perception of efficacy in controlling their consumption, thereby undermining subsequent attempts to exert such control. In an attempt to overcome the resulting negative affect, the individual increases substance use to the point of excess (Marlatt, 1985).

Collins, Lapp and Izzo (1994) have argued that an analogous phenomenon may occur for restrained social drinkers who, because of their preoccupation with controlling alcohol intake, voluntarily set limits on their consumption. Renamed the Limit Violation Effect (LVE), it predicts that the failure to regulate alcohol consumption may result in excessive binge drinking. As with the AVE, the LVE is hypothesized to occur when restrained drinkers blame themselves for violating their limits, experience negative affective reactions for their attributions about the violation, and then drink as a means of coping with their mood. The cyclical nature of restraint, violation and excessive drinking is reinforced over time, as further violations occur.
The original work undertaken by Marlatt and Gordon (1980) was in the context of relapse prevention. The AVE was thought to play a role in fostering relapse, because for some individuals, the typical clinical prescription to limit one’s intake of a substance may result in a cycle of Restraint and excess. The LVE was subjected to a series of laboratory trials to determine whether preloads of alcohol (limit violation) induced excessive intake (for a review see Collins, 1993). Laboratory tests failed to replicate the LVE in two such studies and the authors concluded that for some individuals the LVE effect may serve to increase vigilance and effort to control alcohol intake. The experiments did confirm that the LVE is most likely to identify the process of moving toward excessive drinking, where repeated failures to regulate alcohol intake, self-attributions and the LVE effects occur over longer time periods.

**Temptation and Restraint**

Although attribution did not continue to feature in her and her colleagues’ work, Collins has become an influential thinker in alcohol studies. Over the past 15 years she has developed a scale which recognizes the role of emotions and cognitions in an individual’s capacity for drinking Restraint (a summary of the formative research in the scale’s development is provided at Appendix 11). From theoretical underpinnings of the AVE and the Restrict concept, scale development commenced utilizing the existing Restrained Drinking Scale (RDS; Ruderman & McKirnan, 1984). The RDS consisted of 23 survey items comprising the constructs of limit setting (Restrict) difficulty controlling intake (Govern), negative affect (Emotion) and frequency and amount consumed (Consume), (Collins, George, & Lapp, 1989). The psychometric properties and structure of The restrained Drinking Scale were probed to address the debate about whether the scale was a unitary or multifaceted construct. A cluster analysis of the Restrict, Govern, Emotion and Consume items on a sample of 220 college students (Collins, George & Lapp, 1989) resulted in four identified clusters made up of 13 items. Intercorrelations between clusters were low to moderate, with the two strongest correlations between Consume and the Govern and Emotion
clusters. The items of the resulting Consume cluster related to frequency rather than cognitive preoccupation with controlling alcohol consumption, and the authors concluded that the relationship of Consume to Govern may be representative of the relationship of both to drinking behaviour.

The identification of the components of the RDS scale highlighted a confound in studies that had previously used the undifferentiated RDS scale to predict several commonly used drinking behaviour questionnaires. For example, using The Daily Drinking Questionnaire (DDQ; Cahalan, Cisin, & Crossley, 1996) in conjunction with an undifferentiated RDS, the Consume cluster, representing frequency/quantity of alcohol consumed, confounded criterion (dependent) variables of self-reported consumption - commonly used in alcohol-related studies. When the items of the Consume cluster were removed from analysis, and the remaining RDS items summed to produce a total score, the predicted variance in alcohol consumption was just 2%. When the three clusters (excluding Consume) were treated as three separate predictors, explanatory power rose to 20%. The suppressor effect (Pedhazur, 1997) of Consume (frequency) led to a reconceptualisation that the RDS was in fact a multidimensional measure (Collins et al., 1989).

Although this work had extended the development of the RDS, it was doubtful whether the measurement of preoccupation with control of alcohol use, a central characteristic of the AVE, was entirely cognitive in nature. Restrict and Govern both measured thoughts about control and perceived efficacy of control respectively, but two of the constructs, Emote and Consume, were related to mood states. Collins and Lapp (1991) included the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock & Ebraugh, 1961) to determine the relationship between negative affect and attributional style. The relationship between negative affect, as measured by the BDI was positive, further substantiating the role of negative affect as a risk factor for increased consumption.
Subsequent research on 323 social drinkers (Collins & Lapp, 1992) was designed to replicate and expand on the multiple component view of the measurement of drinking Restraint. Building on and retesting the three RDS factors and Consume, Collins and Lapp (1992) added measures aimed specifically at tapping cognitive preoccupation with limiting drinking. They developed and tested new items that expanded on the cognitive preoccupation said to characterise restrained drinkers. Replication studies were aimed at confirming the three original Restraint-related RDS clusters identified by Collins et al. (1989), and simultaneously examining the view that Restraint includes successful and unsuccessful attempts at behavioural regulation. The hypothesis that the nine items of the RDS formed three correlated but distinct components of Restraint was tested by confirmatory factor analysis using Lisrel 8.52 (Jöreskog & Sörbom, 1999). The original model reported by Collins et al. (1989) fit the data very well and a small set of highly reliable items resulted, with a robust factor structure.

As a result, a new integrated measure of drinking Restraint was validated and named the Temptation and Restraint Inventory (TRI). The TRI comprised five clusters of items as follows (Table 19, below).

**Table 19: Factors Comprising the Temptation and Restraint Inventory**

<table>
<thead>
<tr>
<th>From the Restrained Drinking Scale</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Govern</td>
<td>Difficulty/efficacy in controlling intake</td>
</tr>
<tr>
<td>Restrict</td>
<td>Limit setting and behavioural attempts to control consumption</td>
</tr>
<tr>
<td>Emotion</td>
<td>Nervousness, anxiety and loneliness, high risk for precipitating drinking</td>
</tr>
</tbody>
</table>

Additional items from Collins and Lapp (1992)

- **CP**
  - Cognitive preoccupation – items pertaining to thoughts about limiting drinking
- **Concern**
  - Concern about Drinking – items concerned with plans to reduce drinking and worry about controlling drinking
To further examine the relationships among the five subscales, second order factor analysis using SPSS was applied. Scores for each subscale were entered as variables and two second order factors resulted from the analysis. Cognitive and emotional preoccupation (CEP) was composed of Govern, Emotion and Cognitive Preoccupation and referred to thoughts about drinking and negative emotions. Cognitive and behavioural control (CBC) was composed of Restrict and Concern about Drinking, and referred to thoughts about limiting drinking and attempts to cut down on drinking.

These results supported the hypothesis that drinking Restraint involves a reciprocal relationship between regulated (CBC) and unregulated or excessive (CEP) alcohol intake. Replication studies, albeit with small samples, supported the five subscales and two second order factor-structure of the TRI model in a sample of 132 male social drinkers (Gollnisch & Izzo, 1996) and in a clinical sample (N=193) of an alcohol and drug abuse programme (Connors, Collins, Dermen & Koutsky, 1998). The latter study used a version modified slightly for general substance use.

**Predictive power**

In research dating from 1998, the second order factor structure of the TRI was successfully replicated in clinical populations (Connors, Collins, Dermen, & Koutsky, 1998; Connors et al., 1998; Connors et al., 1998) and in a sample of moderate to heavy drinking adults (Collins et al., 2002). The CEP factor predicted higher levels of weekly alcohol consumption, and the CBC factor predicted slightly lower levels of weekly alcohol consumption. In earlier studies (Collins, & Lapp, 1992) interaction terms for the two factors were found to be significant, and were interpreted as showing that consumption was lower among individuals who were highly preoccupied with alcohol (CEP) but were attempting to control their alcohol intake (CBC). Similarly, consumption was higher in those who were highly preoccupied with control, but not engaged in control behaviours. Alcohol consumption remained unchanged for among individuals who were low on the CEP factor. In Table 20, (page 183),
using regression analysis, CEP scores negatively predicted percentage of days without drinking and positively predicted the percentage of drinking days engaged in heavy drinking, number of drinks per drinking day, and drinking consequences. CBC scores negatively predicted drinks per drinking day.

**Table 20: Significant Findings/Predictions from the TRI**

<table>
<thead>
<tr>
<th>Positive Predictor</th>
<th>CEP</th>
<th>CBC</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of heavy drinking days</td>
<td>Number of drinks per day</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Drinking Consequences</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Negative Predictor</th>
<th>% days without drinking</th>
<th>Drinks per day</th>
</tr>
</thead>
</table>

The TRI has successfully measured opposing tendencies occurring when an individual attempts to instigate control behaviour. The focus on the attempts, successful or otherwise, that are made to regulate behaviour, acknowledges an important conflict inherent in the control process: Being tempted to act and attempting not to act. The Temptation and Restraint concept is thus multidimensional.

**Links to gambling**

From its inceptions in the field of eating disorders and through its iterations in the field of alcohol studies, the construction and validation of the TRI has been a rigorous process. The TRI is a valid and reliable measure of Restraint in alcohol consumption and drug use. The inclusion of temptation as a risk factor for increased alcohol consumption has been a main feature of the research, integrating the complex interaction that occurs between attempts and failures to limit alcohol intake.
The overarching nature of the AVE approach recognises that people report different levels of ability to choose and stick to their budgets, whilst dealing with urges. The existence of monetary limits was demonstrated in Study 1, with detailed evidence of the struggle to set and maintain goals presented. When monetary limits were unsuccessful and the individual yielded to temptation, (i.e. spent more than intended), the failure resulted in an apathy that diminished control efficacy beliefs and behaviours. Such behaviour is almost identical to that described by the LVE (Collins et al., 1994) and adds a very important dimension to gambling research. In attempting to restrain their behaviours to meet their limits, young gamblers do experience successes. The LVE model (Collins et al., 1994) measures those successes, as well as failures, and thereby identifies strengths as well as weaknesses. This is a particularly good reflection of the waxing and waning of psychosocial skills reported in Study 2, as it allows for variation in context and state. The cyclical nature of control, or transition from one regulatory style of limit setting to another (identified in Study 1) is contained within the LVE theory (Marlatt & Gordon, 1980).

It was reasoned that if theoretically consistent and distinguishable dimensions of gambling self-regulation exist, their content and structure should be prerequisite to the study of the relationship between the dimensions and background and criterion variables. In adopting this approach, atheoretical and purely empirical approaches to developing and refining measurement instruments were rejected. Instead, an explicit theoretical model was taken to be the starting point and empirical results were used to support, refute or revise the instrument and the theory on which it is based. In applying this approach the Collins and Lapp (1992) model was judged to be the best model because it encompasses key empirical findings from Study 1 and current themes in gambling literature. Consistent with this approach, the research provided support for the theoretical basis of the Temptation and Restraint concept and also led to its subsequent revision and evolution as a Temptation and Restraint Inventory for Gambling.
The approach acknowledges a reciprocal relationship between cognitively regulated behaviour and unregulated or excessive behaviour. Control failure is likely to be higher amongst those suffering the LVE, i.e. preoccupied with control than those whose cognitive self-regulation strategies are sound. Eliminating preoccupation with control and at the same time strengthening cognitive control, should improve limit-setting outcomes.

Method

Measure development

The adapted gambling Temptation and Restraint Inventory (referred to hereafter as G-TRI) was designed to measure five dimensions of gambling behaviour within the theoretical framework of Restricting and disinhibiting gambling. The G-TRI consists of 15 items, each is rated on a 9-point Likert-type scale where "1" reflects a lack of preoccupation and "9" reflects a high degree of preoccupation. The items form five first-order factors, three of which were drawn from factor and confirmatory analyses of the restrained Drinking Scale (Ruderman & McKirnan, 1984). These three factors are Govern (difficulty controlling gambling), Restrict (attempts to limit gambling) and Emotion (negative affect as a reason for gambling). The other two factors developed by Collins and Lapp (1992), were concern about gambling (Concern; plans to reduce gambling/worry about controlling gambling) and cognitive preoccupation (CP; thoughts about gambling). All five factors fit within a theoretical second order structure; CEP (Cognitive and Emotional Preoccupation) and Cognitive and Behavioural Concern (Cognitive Behavioural Control). The cognitive and emotional preoccupation second order factor, (CEP) is composed of Govern, Emotion, and CP and essentially measures the temptation to gamble. The cognitive behavioural control higher-order factor (CBC) is composed of Restrict and Concern and essentially measures the control/restriction of gambling behaviour.
The original Temptation and Restraint Inventory developed for alcohol use (Collins & Lapp, 1992; referred to hereafter as the A-TRI) was adapted for a gambling sample, and minor modifications made to terminology as deemed appropriate for a youth sample. Pilot testing of the G-TRI (detailed below and provided at Appendix 12) occurred during October 1999 with three groups of 5 youth (9 males and 6 females; 4 students and 11 employed youth) aged between 16 and 24. The instrument was completed as a pen and paper survey after which respondents recounted their thoughts about the instrument. Consideration was given to suggestions made by youth and minor modifications were made. These are detailed below within the description of each concept, and the original item is provided where the change was more than simply substituting gambling for drinking. Items 2, 13 and 15, were measured on a scale of 1 to 9 with 1 = None and 9 = a great deal. Each of these items was modified for consistency with the 12 other items. In line with the A-TRI (Collins & Lapp, 1992) the wording in the adapted 15 item instrument was deemed appropriate for high school students aged 13 and older, and the instructions were straight-forward.

**Govern**

**Govern Items and respective numbers**

9. Do you find that once you start gambling it is difficult for you to stop?

13. Do you have difficulty controlling your gambling?

   [How much difficulty do you have controlling your drinking?]

15. Do you find it takes considerable effort to keep your gambling under control?

   [How much effort does it take for you to keep your drinking under control?]

The Govern factor (above) refers to difficulty controlling gambling participation. These items in particular elicit information about the effort required to maintain
control and the difficulty in discontinuing a session once it has begun. The latter concept links to the assertion that problem gamblers are distinguished not by the frequency of participation but by the duration of sessions (Dickerson, 1999; Schellinck & Shrans, 1998). The degree of effort required to maintain control may signal the presence or absence of competing tendencies, or emotional motivations, that interfere with adhering to set limits. Other items comprising the G-TRI are listed below, along with discussion of the related concept.

**Emotion**

<table>
<thead>
<tr>
<th>Emote items and numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When you feel unhappy or anxious are you more likely to gamble?</td>
</tr>
<tr>
<td>['unhappy' inserted]</td>
</tr>
<tr>
<td>2. When you feel lonely are you more likely to gamble?</td>
</tr>
<tr>
<td>6. Do you ever feel so stressed or nervous that you really need to gamble?</td>
</tr>
<tr>
<td>['stressed' inserted]</td>
</tr>
</tbody>
</table>

Emotions have powerful effects on choice (Mellers, Schwartz, & Weber, 1997). Nervousness, anxiety and loneliness have been shown to place a person at high risk of drinking (Collins & Lapp, 1989; 1991; Collins, Koutsky & Izzo, 2000). The investigation of the relationship between emotion and gambling outcomes has progressed (Boyer & Dickerson, 2003; Hills et al., 2001; Scannell et al., 2000; Shepherd & Dickerson, 2001) and was a key factor throughout the qualitative analysis.

The Emotion factor measures negative affect as a reason for gambling. The wording of the first and third Emotion items were modified slightly to reflect the findings from Study 1, in which gamblers aged between 16 and 25 did not discern and articulate distinct emotions clearly, but understood their negative affect as stress and/or unhappiness. Consequently the words “unhappy or” were inserted in the first item, and “stressed or” were inserted into the third item.
Cognitive preoccupation

CP items and numbers

4. Do you attempt to cut down the amount of time or money you gamble?
7. Do thoughts about gambling intrude into your every-day activities?
[replaced ‘daily’ with ‘every-day’]
11. Is it hard to distract yourself from thinking about gambling?

Cognitive preoccupation is said to characterise drinkers engaged in a constant effort to limit their drinking behaviour. As control over the behaviour becomes more tenuous, the amount of cognitive effort applied in order to regain control increases to the extent that it occupies much of the cognitive resources available (Baumeister, 1997). The cognitive aspect refers to the quality of thinking, and preoccupation with maintaining control. Both concepts have been implicated in the cycle of limit violation and bingeing observed in substance abuse (Collins et al., 1989), and were demonstrated by the contingency regulated gamblers in the LMM.

Restrict

Restrict items and numbers

3. How often do you attempt to cut down the amount you gamble?
10. Do feelings of guilt about gambling too much help you control your gambling?
14. Do you ever cut back on your gambling in an attempt to change your gambling habits?

Restrict is a measure of behavioural attempts to control gambling and change participation habits. Throughout the interviews informing the LMM respondents discussed their constant efforts to limit their gambling, and their feelings of guilt for not being able to do so. Many from the contingency regulated groups (BR and RL)
were attempting to change their gambling habits but acknowledged the futility of their efforts as they were caught into a cycle of restricting themselves to a limit and failing repeatedly to meet it.

**Concern**

<table>
<thead>
<tr>
<th>Concern items and numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Does seeing other people gamble remind you of your efforts to control your own gambling?</td>
</tr>
<tr>
<td>8. Does seeing commercials, magazine advertisements, and or signs for gambling venues make you think about the need to limit your gambling?</td>
</tr>
<tr>
<td>12. Do the sights and sounds of gambling make you think about limiting your gambling?</td>
</tr>
</tbody>
</table>

Concern denotes a degree of worry about gambling. Environmental cues evoked concerns and attempts were then made to transform the concern into a behavioural change, such as setting limits. A mild level of concern was also evident amongst some self-regulated gamblers who contrasted their own behaviour with the behaviour of those around them.

**Data collection, sample composition and ethics**

Clearance was received from the University of Western Sydney, Macarthur, Ethics Review Committee (Human Subjects) in January 1997 to administer the quantitative surveys; protocol number 97/120. In November 1999 Woolcott Research P/L conducted a random telephone survey of 800 men and women aged between 16 and 24 years in Sydney and New South Wales country areas. The sample approximated population strata for age, sex and area. Telephone subjects were recruited via a computer aided telephone interview system (CATI) with a random digit dialing facility. A request was made to speak to a person in the appropriate age group, who was then invited to participate in the survey. To obtain telephone interviews, 27,059 calls were made with a refusal rate of 10%. Regular gamblers (twice a month or more
often; \( n=226 \) completed the entire survey and lower frequency players were screened from the section on gambling related Harms. For the purposes of this thesis, the survey contained, 26 Harm items (Table 25, page 209) 12 TRI items (commencing page 186) and demographic items (as shown in Appendix 7).

High School students were excluded from the telephone collection and the same survey instrument (self-completion, written format) was administered to a random selection of six high schools (3 country and 3 city) in March 2000. One high school declined to participate in the study and was replaced with the geographically closest school. The telephone and school surveys were structured so that regular gamblers (twice a month or more often; \( n=221 \)) completed the entire survey, with lower frequency players screened from the section on Harms. Both surveys were combined and analysed as a single data set culminating in a representative sample of 1008 people (48.5% male and 51.5% female). The mean age of the sample was 19 (SD = 2.52) and most subjects were unpartnered (60%) and living at home (74.5%), with 20% coming from non-English speaking backgrounds. Demographics for the sample are at Appendix 13 and the survey instrument at Appendix 14

Based on averages from stratified and representative surveys completed in New South Wales during 1995 and 1997 (Dickerson et al., 1996; 1998) the estimated prevalence of regular gamblers amongst 18 to 24-year-olds is between 200 and 280 (approximately 24% of a stratified sample of 1200 adults). Prevalence has not been estimated in Australia for 16 to 17-year-olds but could conservatively be expected to be approximately 10%. Therefore, in the current sample, 10% of 16 to 17-year-olds (\( n=362 \)) would conservatively equate to 30 people. Thus, for the combined sample of

\[ 4 \] The survey was designed to meet the requirements of a study of Youth Gambling undertaken for the NSW Department of Gaming and Racing. The items applicable to the present thesis are the demographic questions 1 through 6 and 111 through 120. The G-TRI items contained within the survey were provided separately at Appendix 12.
18 to 24-year-olds and 16 to 17-year-olds, a total sample base of at least 250 regular gamblers could be expected.

**Statistical strategy**

With the predominant aims of the study being to validate the main themes from the LMM and to use the A-TRI measure to model another addictive behaviour, there were strong theoretical and empirical reasons to proceed on the basis of confirmatory factor analysis (CFA) and structural equation modelling techniques. These techniques enable tests of nested models, as demonstrated for A-TRI (Collins & Lapp, 1992), but in the present study applied to youth gambling. The model generation strategy was not intended to be exploratory, but would become exploratory if the full model could not be estimated. The rationale for the statistical procedures used is set out below.

Structural equation modeling (SEM) is a statistical methodology that takes a confirmatory (i.e. hypothesis-testing) approach to the multivariate analysis of a theoretical structure. By demanding that the pattern of inter-variable relations be specified a priori, SEM analysis of data can be used for inferential purposes (Byrne 1998). Causal processes may be modelled by a series of structural (i.e. regression) equations, providing a clearer conceptualisation of the theory under study. Unlike other linear statistical models which provide default settings, SEM requires the researcher to specify all relations in the model, ensuring thoughtful construction of the model to be tested. The advantages SEM has over correlation, multiple regression and ANOVA are in the capability to isolate parameter estimates from uniquenesses and unreliability of their indicators, thus obtaining parameter estimates close to their population values (Hoyle, 1995).

A detailed overview of the CFA approach is beyond the scope of the present investigation, and can be found elsewhere (e.g. Jöreskog, 1989; Jöreskog, 1993; Marsh, Balla, & McDonald, 1988; Marsh & Hocevar, 1985; Pedhazur & Smelkin,
1991). Briefly an a priori structure is posited which tests the ability of a solution based on this structure to fit the data. The parameters typically consist of factor loadings for the relations between measured variables and latent factors. The factors variances and covariances are the relations among the factors, and factor uniquenesses is the combination of measurement and error variance (Marsh, 1993).

According to Byrne (1998), in conducting CFAs the researcher draws on knowledge of the theoretical structure of the variables, proposes a priori a factor structure, and then statistically tests this hypothesized factor structure. In the present study it was hypothesized that (a) each measured variable would have a non-zero loading on the factor it was designed to measure and a zero loading on all other factors and (b) that the error terms (referred to as uniqueness) for each measured variable would be uncorrelated (unless stated otherwise).

Particularly important for assessing the validity of an existing model, SEM incorporates both observed and unobserved (latent) variables. Simultaneous testing of the hypothesised model determines the extent to which it is consistent with the data. If goodness of fit is adequate, the model argues for the plausibility of postulated relationships among variables; if it is inadequate, the tenability of such relations is rejected. Two types of models exist (1) the (CFA) measurement model which depicts the relationships between the latent variables and their observed measures, and (2) a path model which allows for the specification of regression structure among the latent variables, thus depicting the relations among the latent variables themselves (Byrne, 1998). The latter is not undertaken in this study.

These SEM characteristics meet the need in the present research to address theoretical questions about the structural validity of the Temptation and Restraint Inventory as a measurement instrument for gambling and the structure of the model as applied to alcohol (Collins & Lapp, 1992). The rationale for the statistical strategy was to better understand the psychological cognitive-behavioural processes that
influence gambling behaviour. The initial procedure was to estimate the parameters for the five factor G-TRI based on those specified for the A-TRI by Collins and Lapp (1992).

**Statistical analyses**

- One factor congeneric models to evaluate the goodness of fit for each of the five scales.
- A CFA comprising the five dimensions to test for this structural validity of the model
- A 2 factor Second Order SEM for the 5 first order factors.

Once a satisfactory model could be achieved, the next step was to identify whether or not a hierarchical structure comprising CEP and CBC existed, as posited by the A-TRI, and then to fit a full SEM.

**Confirmatory factor analysis approach**

Confirmatory factor analysis was conducted using Lisrel 8.52 (Jöreskog & Sörbom, 1999) based on a 15 by 15 covariance matrix constructed using Prelis 2.3 (Jöreskog & Sörbom, 1996). The covariance matrix was constructed from 9-point Likert-type scales using pairwise deletion of missing data. The covariance matrix was used for all subsequent analysis, and following Hoyle and Panter (1995), Maximum Likelihood was adopted as the estimation method for all tests. It should be noted that only the TRI items were used in the analysis. It is accepted practice that one-factor congeneric CFAs be conducted to structurally validate each scale, prior to fitting all the factors as a single model. In the present research, the scales were comprised of three items only. In SEM terms this means that each scale is “saturated” and as such cannot be invalidated. To address this limitation and validate the scales, three one-factor congeneric models were constructed for each scale, each with one item constrained equivalent to another (i.e. 1 with 2, 2 and with 3, and 1 with 3). As these constitute nested models the Non-normed fit indices (NNFIs) can be compared to
determine if one of the items fits poorly. All NNFls were acceptable and are tabled in (Appendix 15).

**Model of best fit criteria**

Lisrel 8.52 (Jöreskog & Sörbom, 1999) offers researchers a range of different fit indices to determine the best model fit. One of the most widely adopted dimensions for classifying fit indexes is the absolute versus incremental distinction of fit indexes (Marsh, Balla & Macdonald, 1988; Tanaka, 1993). An absolute fit index directly assesses how well an a priori model reproduces the sample data, with no reference model to assess the increment in model fit. For this reason the family of incremental fit indices has become the most popular (Marsh, Balla, & Hau, 1996). Incremental fit indices suggest the degree of improvement in model fit by comparing the researchers model to a nested baseline model (Hu & Bentler, 1995). Typically, the baseline model is a null model in which all the observed variables are uncorrelated (Bentler & Bonett, 1980), and the term nested denotes that each successive model is identical in composition. As yet there is no consensus among researchers as to which fit indices are best for this purpose (Marsh et al., 1996), however, it seems that the family of incremental fit indices is one of the most popular. Following Marsh et al. (1996) in the present research two qualitatively different but complementary incremental fit indices, the non-normed fit index (NNFI: also known as the Tucker Lewis Index) and the normed relative comparative fit indice (CFI: the normed version of the RNI), are used to assist in determining model fit. In general, the arbitrary and commonly accepted application of the minimum requirement of .9 rule is applied with these indices to determine an acceptable fit for a model. The primary distinction between these two fit indices is that the NNFI penalizes model complexity, as in the case of estimating additional parameters, and rewards model parsimony, as in the case of invariance testing across multiple groups (Marsh et. al., 1996). Each of these fit indices also has the advantage that they are not biased by sample size (Marsh et. al., 1996).
The Residual Mean Error of Approximation (RMSEA) is also used in assessing model fit in the present research. The RMSEA is a parsimonious measure of the discrepancy of model fit. As a measure of close fit, Steiger (1990) and Browne and Mels (1990) recommend that RMSEA values of less than 0.05 indicate a close fit. Values in the range of 0.05 and 0.08 indicate medium fit and MacCullum, Browne, and Sugawara (1996) suggest that values in the range of 0.08 and 0.1 indicate mediocre fit. Other fit indices reported are the Chi Squared and degrees of freedom. The reader is referred to Hu & Bentler, (1995); Jöreskog and Sörbom, (1996); MacCullum, Browne & Sugawara (1996) and Marsh, et al. (1996) for detailed discussion regarding the fit indices used in the present research. However, while statistical results such as described above aid in the selection of a model, ultimately there is a degree of subjectivity and professional judgment in balancing the statistical and practical significance involved in selecting the best model (Marsh, Hau, Balla, & Grayson, 1998).

**Identification of saturated models**

Each of the scales of the G-TRI is supported by three items, and in SEM terms is known as a saturated model. A saturated model is one in which the number of estimated parameters equals the number of data points (i.e. variances and covariances of the observed variables) and thus has 0 degrees of freedom. Consequently, a 'saturated' model always fits perfectly, making it meaningless to assess model plausibility. With so few measured variables per factor, it is possible to constrain each variable to ensure the estimated parameters are fewer than the number of variables and thus overcome 'saturation'. This is done by alternately constraining each measured variable to be equal to each other measured variable by use of the ‘EQ’ command. Thus more than one plausible model exists, and a unique solution can be found (Chou & Bentler, 1995). This process results in an over identified model which is of primary interest because it allows for the critically important possibility that a model could be found to fit the observed data poorly.
(falsifiable; MacCullum, 1995. This strategy will be used as an initial assessment of the statistical validity of each scale.

**Measurement models**

Measurement models are fitted to determine how well the validated scales combine as a multidimensional model. Generally the necessary conditions for a well-defined model are face validity, and structural validity with the relationship of the dimensions reflecting the hypothesised relationships. Improper models occur when variances are negative, and/or completely standardised loadings and multiple correlations greater than one occur. Multicolinearity occurs when two or more scales are performing almost identically, that is, they are highly correlated. Although conceptually and theoretically distinct, they are not empirically distinct. Hence from a measurement perspective one of the scales is redundant and can be substituted for by the other. Having been adapted from alcohol studies in which the conceptual and empirical relationship of the items had been well established, it was necessary to work through the G-TRI scale-by-scale with a view to removing items that were not loading particularly well on hypothesised scales.

**Statistical Analyses**

**Prelis examination of distributions**

Raw data was submitted to Prelis 2.3 (Jöreskog & Sörbom, 1996) to generate covariance matrices. Univariate and multivariate estimates of skewness and kurtosis were obtained through Prelis 2.3 (Jöreskog & Sörbom, 1996).

A normal distribution of scores is characterised by skewness and kurtosis values approximating zero. Where values deviate from zero, normality is defined within a range either side of zero. No definite cut-points have been assigned for zero or normal distributions and values are then considered within the range suggested by montecarlo studies (Holmes-Smith, 1999). Values are considered moderately non-
normal if skewness values range between 2.00 and 3.00 and kurtosis values range from 7.00 to 21.00. Extreme skewness and kurtosis values are beyond the highest values given, respectively (West, Finch, & Curran, 1995). The 15 item five factor model was submitted to Prelis 2.3 (Jöreskog & Sörbom, 1996) for preliminary analysis and to generate a covariance matrix for use in subsequent Lisrel analysis. Normal scores with a mean of 0 and standard deviation of 1 were generated and saved for use in subsequent analysis. Kurtosis values for individual items, ranged from −7 to 2.09 with the exception of one item, Concern5 at 8.372. Scores for skewness ranged from 0.43 to 3.54. Emote6 (3.46) and Govern13 (3.54) were noted as being slightly above the range of acceptable normality.

**Psychometric properties and construct validity of the G-TRI**

A brief introduction to CFA, the method used to determine the psychometric properties and construct validity of the responses for each of the scales and the model generally was described under the Conceptual Model earlier in this section. Following the A-TRI (Collins & Lapp, 1992) all G-TRI items were measured on a 9-point scale and treated as continuous. Each of the 15 items was rated on a scale of 1 to 9, where 1 = never and 9 = always. Unless otherwise specified analyses were conducted using Lisrel Version 8.52 (Jöreskog & Sörbom, 1999).

The model generation approach (Hoyle, 1995) adopted in the present research used a series of one-factor congeneric models to confirm construct validity. Unidimensionality of items for latent variables is established by a combination of the goodness of fit indices, the structural relations factor loadings, uniqueness, and inter-item correlations. Face validity has been assured by adopting a model previously validated in a similar area, a recommended prerequisite for employing SEM techniques (MacCullum, 1995). Due to the established validity of the A-TRI, and the fact that this was not an exploratory analysis, it was thought unlikely that any items would need to be deleted from the scales. However, three circumstances would provide the basis for deletion. Firstly, similarity or overlap in items, for example
where item stems were almost identical; secondly, and not applicable to the current study, where face validity was questionable, and thirdly where statistical properties decreed the scale would be improved because the items statistical properties are improper. Correlated uniqueness, the term used to denote freeing the residual variance of two or more items to correlate (also known as measurement error) were permitted only on substantive grounds, for example when it was a method effect inasmuch as the stem of the items were the same.

Second order models

With an established theoretical precedent for fitting second order factors, a statistically validated set of indicator variables, and a structurally sound measurement model, the theoretical and substantive requirements for fitting second order model(s) were met. However, one possible disadvantage of fitting second order models, particularly relevant to the current context, stems from the debate in the literature (Marsh, Craven, & McInerney, 2000) about whether second order factors achieve any useful purpose, as they reduce the variation in the model which the researcher is endeavouring to explain (see also Marsh, Craven, Debus & Hinkley, 2003). On the positive side, second order factor(s) overcome multicollinearity considerations by accounting for high correlations between first order factors. The reader is referred Jöreskog (1993) and Tabachnick and Fidell (1996) for discussions of the problems of colinearity amongst predictor variables. If a second order factor(s) exists, substantial correlations between first order factors would be acceptable because they are linked to an overarching explanatory factor. The issue is one of parsimony, that is to say, covariation among the three first-order factors would be explained fully by their regression on the second-order factor. The presence of second order explanatory factors may also reduce unexplained variance in the model (Schumacker & Lomax, 1996).

In the Collins and Lapp (1992) model each of the latent variables made a unique contribution as demonstrated in the measurement model, whilst also covarying. The
covariation between the latent factors Govern, Emote and CP was thought to result from their relationship to a second order factor (Figure 6, below). That is to say, whilst Govern, Emote and CP were unique contributors to the model, they also shared a quality that could be understood in terms of a superordinate theme. The superordinate theme, Temptation and Restraint, was measured by preoccupation with control of gambling, both at a cognitive and emotional level (Cognitive Emotional Preoccupation; CEP) and Cognitive Behavioural Control (CBC). The Collins and Lapp (1992) model posited that control over behaviour is hierarchically ordered by CEP and CBC, as well as being multidimensional. It was hypothesised that the G-TRI model would perform in accordance with drug and alcohol studies, in which case the CEP factor would predict higher incidences of and greater impacts from gambling, and CBC would predict lower incidences of and fewer gambling related problems.

![Diagram of model schema]

**Figure 6:** Hypothesised model schema

**Research aims**

The aim of the present study was firstly to evaluate the hypothesis that a five dimensional model comprising the theoretical restrict/disinhibition construct (represented by CEP and CBC) was a tenable model of gambling regulation able to explain gambling behaviour amongst a sample of youth aged 18 to 24 years (Hypothesis 1). If a tenable model is found, this would suggest that gambling
behaviour is multifaceted, comprising Govem, Restrict, Emotion, Cognitive Preoccupation and Concern (Hypothesis 2). Subsequently, if a second order model successfully fit the data it would indicate that control over gambling involved both a propensity to restrict participation as well as a tendency to splurge (Hypothesis 3). If the preceding models could be established, a subsequent analyses would investigate the capacity of the model to predict participation rates (Hypothesis 4). The steps in the first three aims were to establish the structural validity of the G-TRI, or a modified version, and to access the conceptual framework by fitting a SEM with two second order factors as done for the A-TRI (Collins & Lapp, 1992). The present study asserts that gambling behaviour is hierarchical and multifaceted. Moreover there are two higher order factors, with an interaction between these factors. These were tested by the statistical hypotheses:

- Each of the five dimensions stands in its own right as a scale (Congenric models)
- The scales are multi dimensional (CFA)
- There are two second order factors with an anticipated relationship (second order SEM)
- CBC predicts lower levels of gambling participation and Harms, and CEP predicts higher levels of participation and Harms (Regression).
Chapter 10: Results and discussion of the G-TRI

To investigate the hypotheses stated in chapter 9, (page 200), Chapter 10 presents results of the analyses in the following order:

- Sample characteristics; descriptive statistics for the G-TRI and Psychometric Properties of the G-TRI.
- Results of the model fits (CFAs) for the multifaceted G-TRI
- Results of fitting the second order factors CEP and CBC to the data.
- Results of multiple regression analysis of CEP and CBC on Harms and frequency of gambling
- Summary and discussion of the implications for the research aims, methodological considerations and future gambling research.

Sample characteristics

Participation rates

The data collection resulted in a sample of 1008. Respondents playing 2 to 3 times per month were combined with weekly or more frequent respondents and deemed 'regular' gamblers (n=226) who formed the base analysis group\(^5\). Statistics hereafter are derived from these 226 regulars (accounting for 22.4% of the total sample N=1008) and were investigated for differences across key demographic categories age, sex, and area (Table 21, page 202).

Based on the most recent updated population estimates available at the time (Australian Bureau of Statistics; October, 1999) there were 792,563 16 to 24-year-

\(^5\) Occasional gamblers played less than once per month and Infrequent gamblers less than monthly
olds living in New South Wales; 523,769 in Sydney and 268,794 across the rest of New South Wales. Extrapolating to the population of NSW, equivalent figures are given in Tables 21 and 22 below.

<table>
<thead>
<tr>
<th>Playrate</th>
<th>N</th>
<th>%</th>
<th>Population equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular</td>
<td>226</td>
<td>22.4</td>
<td>177,534</td>
</tr>
<tr>
<td>Infrequent</td>
<td>349</td>
<td>34.6</td>
<td>274,227</td>
</tr>
<tr>
<td>Occasional</td>
<td>180</td>
<td>17.9</td>
<td>141,868</td>
</tr>
<tr>
<td>Non-player</td>
<td>245</td>
<td>24.3</td>
<td>192,593</td>
</tr>
<tr>
<td>No response</td>
<td>8</td>
<td>0.8</td>
<td>6,341</td>
</tr>
<tr>
<td></td>
<td>1008</td>
<td>100</td>
<td>792,563</td>
</tr>
</tbody>
</table>

From Table 21 (above), two hundred and twenty-six respondents (22.4% of the sample) gambled on a regular basis. Due to stratification of key demographic variables, it is reasonable to equate this percentage to a figure of 177,534 regular gamblers in the New South Wales population. Key demographics by which the sample was stratified are given in Table 22 (page 203). Of note is the sharp increase in participation at age 18 years with youth aged 18 and over accounting for 67% of the regular gambling population in the age range. Just 2 percentage points separate participation of city and rural dwellers, whilst males account for 64% of the sample. These figures coincide with previous prevalence studies undertaken in the state of New South Wales (Dickerson, 1998).
Table 22: Regular Gamblers; Population Estimates by Demographics

<table>
<thead>
<tr>
<th>Demographic</th>
<th>N</th>
<th>% (N=1008)</th>
<th>Population equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-17 yrs</td>
<td>74</td>
<td>7.3</td>
<td>57,857</td>
</tr>
<tr>
<td>18 and over</td>
<td>152</td>
<td>15.1</td>
<td>119,677</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>144</td>
<td>14.3</td>
<td>113,337</td>
</tr>
<tr>
<td>Female</td>
<td>82</td>
<td>8.1</td>
<td>64,197</td>
</tr>
<tr>
<td>Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sydney</td>
<td>121</td>
<td>12.0</td>
<td>95,108</td>
</tr>
<tr>
<td>Country NSW</td>
<td>105</td>
<td>10.4</td>
<td>82,426</td>
</tr>
</tbody>
</table>

Key demographics

Table 23: Regular Gamblers; Average Session Spend by Key Demographics

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Sex</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;18</td>
<td>18+</td>
<td>Male</td>
</tr>
<tr>
<td>Mean $</td>
<td>32.40</td>
<td>49.99</td>
<td>56.49</td>
</tr>
<tr>
<td>(Sd)</td>
<td>(50.18)</td>
<td>(116.31)</td>
<td>(120.28)</td>
</tr>
<tr>
<td>Median $</td>
<td>17.43</td>
<td>20.00</td>
<td>20.00</td>
</tr>
</tbody>
</table>

Referring to Tables 23 (above) and 24 (page 204), no significant differences occurred for average amount spent on gambling by age, sex or area. Median amount spent by males was $20 compared to $10 by females. The under 18s spent slightly less, on average than 18s and over, and country respondents spent slightly less than city respondents, with less than $3 per session separating age and area groupings. Electronic gaming machines were by far the most common form of gambling undertaken, with the exception of the underaged sample who bought instant lottery tickets most often (Appendix 16). The minimum amount spent per session was $1
and the maximum was $1000. Average amount spent was $41.81 (SD = 105.81), and a more reliable estimate is the median spend of $15 per session.

| Table 24: Regular Players; Session Spend by Key Demographics |
|----------------------------------|----------------|----------------|----------------|
| Amount Spent                     | Age            | Sex            | Area           |
| <18                              | %              | %              | Male           |
| $1-$5                            | 35.1           | 19.9           | 17.4           |
| $5-$10                           | 23.0           | 21.2           | 21.5           |
| $10-$15                          | 6.8            | 6.6            | 6.9            |
| $15-$20                          | 17.6           | 14.6           | 15.3           |
| $20-$50                          | 13.5           | 22.5           | 25.0           |
| $50+                             | 4.1            | 15.2           | 13.9           |
| Total N                          | 74.0           | 152.0          | 144.0          |

Age $\chi^2(5) = 12.44; p < .05$  Sex $\chi^2(5) = 16.37; p < .01$  Area $\chi^2(5) = 8.28; p < .05$

**Background variables**

**Age**

As illustrated in Table 24 (above) age is not a factor in defining regular gambling. As shown in Appendix 16, 16 and 17-year-olds favour instant lotteries and scratchies (20%) followed closely by horse-racing (19%). These figures are consistent with findings from the Youth Gambling Study (Madden, 1996) in which instant lotteries and racing were the most common forms of gambling for females and males respectively. The similarity in playrate for both age groups is mirrored in the equivalence of amounts spent by each age group. Sixteen and 17-year-olds were highly represented in the $0-$5 per session spend category (35%) compared to 18 to 24-year-olds (20%). In categories ranging from $5 up to $20 approximately the same proportion of cases occurred for both age groups. Beyond the $20-$50 category and
particularly in the $50 plus category, representation of 16 to 17-year-olds declined sharply. This can be understood in the context of younger people having lower incomes and possibly still being in full-time study and with only part-time employment.

Figure 7: Participation rates by sex

**Sex**

Figure 7 (above) shows that gambling participation rates were highest for males. Noticeably regular female gamblers (16%) are represented at a ratio of approximately 1:2 compared with regular male gamblers (30%). The participation ratio by sex is consistent with other studies in Australia (e.g. Thomas et al., 2000). Sex differences in amount spent were also marked. From Table 24 (page 204) it can be seen that 38% of females spent no more than $5 per session of gambling. The number of males spending $5 per session was 20 percentage points lower (17%). The difference in spend rate between the two groups occurs at about the $20 mark. Thirty percent of males and just 18% of females spend more than $20, which
corresponds to findings from adult studies where men reported spending on average, twice the amount that women did (Dickerson, 1998). In this sample of 16 to 24-year-olds a greater proportion of males spend a greater amount of money per session. Consequently, their losses are also likely to be higher and their reported Harms potentially greater.

The popularity of gaming machines (Appendix 16) was not gender specific with just 6 percentage points separating regular participation rates for males (46.5%) and females (40%). Consistent with previous reports (Dickerson et al., 1996; 1998), Lotto type games and Lotteries appeal less to males (11.7%) than to females (41%). Racing appeals to males (17%) more so than females (8.5%) and this is also consistent with the findings reported by Maddern (1996).

**Area**

In total, participation rates for country people (80%) were higher than for city dwellers (73%). This differs only slightly from the findings of Dickerson et al. (1998), where city people were more highly represented than country people in the weekly playrate. In the present study total and regular participation was highest in the country. Amount spent per session is similar for both areas up to a ceiling of $50. Thereafter, $50 and above, city respondents (17%) out-numbered country respondents (6%) by a ratio of almost 3:1. Given the sex differences in spend patterns, city males are likely to be the biggest spenders of New South Wales’ 16 to 24-year-olds. Popularity of each form of gambling remained consistent across areas.

**Criterion variables**

**Frequency**

Frequency data was collected on a 12-point scale ranging from non-gambler through to gamble 7 days per week. For respondents deemed regular gamblers, frequency started at 2 to 3 times per month, then once per week and through to 7 days per week. Twenty-two and a half percent of the sample gambled regularly (n=226). The
majority of regular gamblers (43.4%) gambled once per week, with 18% gambling
two days per week or more.

**Harm statements**

The Productivity Commission's (1999) analysis of combined data sets drawing on a
large population of respondents provided the best possible conceptual clustering of
Harm items with which to commence work. However, a methodological concern
relating to the sample age and their manner of responding to direct questions about
experienced Harms needed to be addressed.

In the interviews for the original qualitative study (Chapters 5 and 6), youth, young
males particularly, held contradictory attitudes toward gambling. On the one hand
they described substantial life difficulties as a result of gambling, yet did not construe
themselves as having a gambling problem. From the transcripts of the interviews it is
clear that youth do experience Harms as a result of their gambling, but because the
Harms do not manifest in the same way as for adults, they deny or misperceive the
problems that occur. The tendency not to construe themselves as having a problem
may be due in part to the absence of financial commitments and living at home,
which buffered the effects of the sizeable financial losses they sustained.

This contradiction posed methodological issues for the follow-up survey. Given the
insights gleaned from the qualitative interviews, the survey items relating to Harms
were operationalised in a manner which elicited the strength of the perceived
relationship between gambling and Harms rather than asking how often it occurred.
For example, when asking about family fights and gambling, the Productivity
Commission (1999) statement was phrased:

- "My gambling has caused arguments about money with family or
  friends"
- "always, often, sometimes, rarely, never"
For the youth survey the comparable question was:

- “On a scale of 1 = not associated to 9 = strongly associated, could you tell me whether these things go together in your life.
- “Your gambling and family fights/arguments?”

Pilot testing revealed that respondents interpreted the questions as asking whether gambling caused the Harms. All Harm items are listed in Table 25 (page 209). Each respondent’s scores on the 26 Harm items were compiled and the resulting variable was normally distributed, and ranged from 27 to 181 (M = 47.86, SD = 49.16). This variable measured the strength of the causal association between gambling and harmful outcomes.
<table>
<thead>
<tr>
<th>Harm and Item No.</th>
<th>Male %</th>
<th>Female %</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>n=144</td>
<td>n=82</td>
<td>N=226</td>
<td></td>
</tr>
<tr>
<td><strong>Work and study</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>106. losing/changing jobs/schools</td>
<td>4.9</td>
<td>0.0</td>
<td>3.1</td>
</tr>
<tr>
<td>107. taking time out from work/school</td>
<td>4.2</td>
<td>1.2</td>
<td>3.1</td>
</tr>
<tr>
<td>108. working below ability at work/school</td>
<td>4.9</td>
<td>2.4</td>
<td>4.0</td>
</tr>
<tr>
<td><strong>Personal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72. health problems, stress and anxiety</td>
<td>6.3</td>
<td>0.0</td>
<td>4.0</td>
</tr>
<tr>
<td>73. depression</td>
<td>4.2</td>
<td>0.0</td>
<td>2.7</td>
</tr>
<tr>
<td>74. thoughts of suicide</td>
<td>3.5</td>
<td>1.2</td>
<td>2.7</td>
</tr>
<tr>
<td>75. guilt feelings</td>
<td>6.9</td>
<td>6.1</td>
<td>4.4</td>
</tr>
<tr>
<td>79. feeling like a different person</td>
<td>8.3</td>
<td>2.4</td>
<td>6.2</td>
</tr>
<tr>
<td>97. less time spent on sports and hobbies</td>
<td>6.9</td>
<td>2.4</td>
<td>5.3</td>
</tr>
<tr>
<td><strong>Interpersonal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>76 lying to people</td>
<td>6.9</td>
<td>1.2</td>
<td>4.9</td>
</tr>
<tr>
<td>80 fights with friends</td>
<td>10.4</td>
<td>1.2</td>
<td>7.1</td>
</tr>
<tr>
<td>88 living situation issues</td>
<td>14.6</td>
<td>9.8</td>
<td>12.8</td>
</tr>
<tr>
<td>98 family fights and arguments</td>
<td>6.3</td>
<td>1.2</td>
<td>4.4</td>
</tr>
<tr>
<td>100 being mean to others</td>
<td>7.6</td>
<td>2.4</td>
<td>5.8</td>
</tr>
<tr>
<td>103 relationship difficulties</td>
<td>6.3</td>
<td>1.2</td>
<td>4.4</td>
</tr>
<tr>
<td>104 physical violence</td>
<td>5.6</td>
<td>2.4</td>
<td>4.4</td>
</tr>
<tr>
<td><strong>Legal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>102. taking money without asking</td>
<td>4.9</td>
<td>1.2</td>
<td>3.5</td>
</tr>
<tr>
<td>105. stealing</td>
<td>4.2</td>
<td>3.7</td>
<td>4.0</td>
</tr>
<tr>
<td><strong>Financial</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>81. uncertainty about future finances</td>
<td>5.6</td>
<td>2.4</td>
<td>4.0</td>
</tr>
<tr>
<td>89. shortage of money</td>
<td>9.7</td>
<td>4.9</td>
<td>8.0</td>
</tr>
<tr>
<td>90. having no money to go out</td>
<td>6.9</td>
<td>3.7</td>
<td>5.8</td>
</tr>
<tr>
<td>91. debts (credit cards, bank loans, friends)</td>
<td>5.6</td>
<td>2.4</td>
<td>4.4</td>
</tr>
<tr>
<td>92. selling or losing possessions</td>
<td>6.3</td>
<td>1.2</td>
<td>4.4</td>
</tr>
<tr>
<td>94. borrowing from friends, family</td>
<td>6.3</td>
<td>1.2</td>
<td>4.4</td>
</tr>
<tr>
<td>95. borrowing from banks, building societies etc</td>
<td>2.8</td>
<td>1.2</td>
<td>2.2</td>
</tr>
<tr>
<td>99. not paying money back</td>
<td>4.9</td>
<td>1.2</td>
<td>3.5</td>
</tr>
</tbody>
</table>
Demographic associations with Harm statements

Age
Independent t-tests revealed significant differences occurred for the two age groups with over 18s more likely to have thoughts of suicide, fights with friends, take money without asking and fail to repay monies borrowed (Table 26, page 211).

Sex
Independent t-tests revealed significant differences between males and females, with males more likely to have reported losing or changing jobs/schools, lying to people, fighting with friends, relationship difficulties, shortage of money, borrowing from friends/family and problems with living situation (Table 26, page 211). Significant differences occurred with males more likely to report stress and anxiety, depression, feeling like a different person, spending less time on sports and hobbies, being mean to others and feeling insecure about future finances (Table 26, page 211). No significant differences occurred between males and females for likelihood of feeling guilty and gambling related thoughts of suicide.

Area
Just three significant differences occurred between areas; country respondents reported more incidences of a relationship between gambling and suicide than did Sydney respondents (Table 26, page 211). Financial considerations were also more problematic for country respondents, who were more likely to borrow from friends and family, and banks and building societies due to gambling.
Table 26: Harm Items, Scale Reliability, Means, Standard Deviations and t-Values for Key Demographics

<table>
<thead>
<tr>
<th>Harm Category</th>
<th>Alpha</th>
<th>Mean (SD)</th>
<th>T-values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Age</td>
<td>Sex</td>
</tr>
<tr>
<td>Work and study</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Losing/Changing jobs/schools</td>
<td>.80</td>
<td>1.7(1.8)</td>
<td>1.26</td>
</tr>
<tr>
<td>Taking time out from work/school</td>
<td>1.7(1.8)</td>
<td>0.92</td>
<td>1.02</td>
</tr>
<tr>
<td>Working below ability at work/school</td>
<td>1.9(2.0)</td>
<td>1.75</td>
<td>1.80</td>
</tr>
<tr>
<td>Personal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health problems, stress and anxiety</td>
<td>.86</td>
<td>2.1(2.1)</td>
<td>0.91</td>
</tr>
<tr>
<td>Depression</td>
<td>1.9(1.8)</td>
<td>1.23</td>
<td></td>
</tr>
<tr>
<td>Thoughts of suicide</td>
<td>1.5(1.6)</td>
<td>*2.58</td>
<td>0.97</td>
</tr>
<tr>
<td>Guilt feelings</td>
<td>2.6(2.2)</td>
<td>0.74</td>
<td>1.14</td>
</tr>
<tr>
<td>Feeling like a different person</td>
<td>2.2(2.2)</td>
<td>1.44</td>
<td>**3.58</td>
</tr>
<tr>
<td>Less time spent on sports and hobbies</td>
<td>2.1(2.1)</td>
<td>0.05</td>
<td>**2.91</td>
</tr>
<tr>
<td>Interpersonal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lying to people</td>
<td>.89</td>
<td>1.9(2.0)</td>
<td>1.49</td>
</tr>
<tr>
<td>Fights with friends</td>
<td>1.8(1.9)</td>
<td>*2.11</td>
<td>*2.11</td>
</tr>
<tr>
<td>Living situation</td>
<td>2.9(2.9)</td>
<td>1.65</td>
<td>*2.13</td>
</tr>
<tr>
<td>Family fights and arguments</td>
<td>1.8(1.9)</td>
<td>1.82</td>
<td>1.88</td>
</tr>
<tr>
<td>Being mean to others</td>
<td>1.9(2.0)</td>
<td>1.38</td>
<td>**2.98</td>
</tr>
<tr>
<td>Relationship difficulties</td>
<td>1.8(1.9)</td>
<td>0.73</td>
<td>*2.60</td>
</tr>
<tr>
<td>Physical violence</td>
<td>1.7(1.9)</td>
<td>*2.49</td>
<td>1.90</td>
</tr>
<tr>
<td>Legal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taking money without asking</td>
<td>.87</td>
<td>1.7(1.8)</td>
<td>*1.96</td>
</tr>
<tr>
<td>Stealing</td>
<td>1.6(1.8)</td>
<td>*2.22</td>
<td>1.30</td>
</tr>
<tr>
<td>Financial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uncertainty about future finances</td>
<td>.91</td>
<td>2.4(2.3)</td>
<td>0.30</td>
</tr>
<tr>
<td>Shortage of money</td>
<td>2.4(2.4)</td>
<td>0.67</td>
<td>*2.00</td>
</tr>
<tr>
<td>Having no money to go out</td>
<td>2.1(2.2)</td>
<td>1.90</td>
<td>*1.98</td>
</tr>
<tr>
<td>Debts (credit cards, bank loans, friends)</td>
<td>1.9(2.0)</td>
<td>1.58</td>
<td>1.68</td>
</tr>
<tr>
<td>Selling or losing possessions</td>
<td>1.6(1.8)</td>
<td>1.67</td>
<td>1.30</td>
</tr>
<tr>
<td>Borrowing from friends, family</td>
<td>1.9(1.9)</td>
<td>1.10</td>
<td>*1.97</td>
</tr>
<tr>
<td>Borrowing from banks, building societies etc</td>
<td>1.4(1.4)</td>
<td>1.74</td>
<td>0.18</td>
</tr>
<tr>
<td>Not paying money back</td>
<td>1.7(1.8)</td>
<td>**2.69</td>
<td>1.06</td>
</tr>
</tbody>
</table>

*p<.05; **P<.01
Descriptive statistics for the G-TRI

Table 27: Means and Standard Deviations for the G-TRI by Sex

<table>
<thead>
<tr>
<th>Factor</th>
<th>Sex</th>
<th></th>
<th></th>
<th>Single group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Govern</td>
<td>12.65</td>
<td>(17.09)</td>
<td>7.83</td>
<td>(12.56)</td>
</tr>
<tr>
<td>Emote</td>
<td>9.29</td>
<td>(9.77)</td>
<td>6.78</td>
<td>(5.60)</td>
</tr>
<tr>
<td>CP</td>
<td>10.47</td>
<td>(12.99)</td>
<td>8.43</td>
<td>(16.57)</td>
</tr>
<tr>
<td>Restrict</td>
<td>10.90</td>
<td>(6.20)</td>
<td>8.91</td>
<td>(11.60)</td>
</tr>
<tr>
<td>Concern</td>
<td>10.08</td>
<td>(5.98)</td>
<td>8.41</td>
<td>(5.89)</td>
</tr>
</tbody>
</table>

The means and standard deviations for the G-TRI scales used in this research are presented in Table 27 (above). At initial inspection, there were large variances around some means. Although this seems disconcerting, it is not uncommon in gambling research, so much so that when interpreting meaningful figures, such as dollar values and playrates, it has become common practise to provide a median figure. Assumptions of normally distributed data are built into omnibus statistical packages (e.g. SPSS and Statistica) and are commonly violated in social sciences research, rendering the analysis invalid (Rowe, 2000). Lisrel 8.30 software was chosen specifically for its rigour in analysing asymptotic datasets, where a normal distribution is not assumed.

Psychometric properties of the G-TRI

The one-factor congeneric solutions for each of the five G-TRI scales yielded acceptable fit indices (sample syntax at Appendix 17). Four of the five G-TRI scales were well developed and well defined with NNFI's ranging from 1.01 to 1.07 with an average of 1.03. The Restrict scale was at the low end of acceptable values of the NNFI at 0.91. All other scales had moderate factor loadings and provided a good basis for the analyses that followed.
Refining the instrument – Model fits 100-103B

Having established support for the one-factor congeneric models, the next step was to evaluate how well the five scales from the G-TRI fit together as a measurement model, along with criterion and background variables (Syntax for the final model at Appendix 18 and covariance matrix for the final model at Appendix 19).

The a priori five factor G-TRI yielded a $\chi^2(100) = 39.46$, an NNFI = 1.22, CFI = 1.00 and RMSEA = 0.0. Whilst these fit indices are exceptionally good, a final decision as to the acceptability of the five factor structure was suspended until further examination of the model variances and covariances. The a priori model as specified by Collins and Lapp (1992) fit the data satisfactorily, but item 4 (do you attempt to cut down the amount of time or money you gamble?) loaded on to Restrict and Concern, suggesting it sat better in the Cognitive Behavioural Control side of the model. Improper loadings between Restrict and Concern (1.04) occurred suggesting that these two factors were not adequately discriminated, an anticipated outcome as they were not well defined in the congeneric models initially. Restrict and Concern were therefore best represented by the posited Cognitive Behavioural Control factor$^{30}$. No other modifications were suggested by the programme. A summary of the model building process is given in Table 28 (page 214) with further detail following.

$^{30}$ The NNFI's for the four factor model ranged from 0.99 to 1.02 with an average of 1.00, providing a good basis to proceed with fitting a 4 factor measurement model.
Table 28: Results of CFAs for the G-TRI measurement models

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Model Name</th>
<th>$\chi^2$</th>
<th>df</th>
<th>RMSEA</th>
<th>RMSEA Prob &lt; .05</th>
<th>NNFI</th>
<th>CFI</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>M100</td>
<td>5 factors a priori</td>
<td>39.46</td>
<td>100</td>
<td>0.0</td>
<td>1.00</td>
<td>1.22</td>
<td>1.00</td>
<td>Not independent</td>
</tr>
<tr>
<td>M101</td>
<td>4 factors</td>
<td>40.99</td>
<td>106</td>
<td>0.0</td>
<td>1.00</td>
<td>1.22</td>
<td>1.00</td>
<td>Collapse Restrict and Concern</td>
</tr>
<tr>
<td>M102</td>
<td>4 factors</td>
<td>29.35</td>
<td>106</td>
<td>0.0</td>
<td>1.00</td>
<td>1.26</td>
<td>1.00</td>
<td>Reassign CP4 to Cognitive Behavioural Control</td>
</tr>
<tr>
<td>M103</td>
<td>4 factors</td>
<td>24.67</td>
<td>105</td>
<td>0.0</td>
<td>1.00</td>
<td>1.27</td>
<td>1.00</td>
<td>Free correlated uniqueness of E6 - CP</td>
</tr>
<tr>
<td>M103b</td>
<td>Add background variables</td>
<td>31.76</td>
<td>138</td>
<td>0.0</td>
<td>1.00</td>
<td>1.41</td>
<td>1.00</td>
<td>As above</td>
</tr>
</tbody>
</table>

Four factor measurement models for the G-TRI

Model 101 – 102

The 5 first order factors of the G-TRI were not sufficiently independent (Model 101). However, a four factor model (Model 102) proved to be a good fit to the data, whilst still retaining the second order factors that drive the theoretical concept underlying the G-TRI. Concern and Restrict were collapsed into a single factor and item 4 was reassigned to the Cognitive Behavioural Control factor. The resulting analysis yielded a $\chi^2(106) = 40.99$, an NNFI of 1.22, CFI of 1.00 and RMSEA of 0.0. This was a well defined model, with no improper loadings and excellent fit statistics. High correlations ranging from .86 to .92 occurred between the latent factors Govern, Emote and CP. Emote6 item, feeling stressed and nervous, loaded more highly onto CP than Emote. Given that stress and nervousness may be emotional responses, they also occupy cognitive resources necessary to carry out behavioural control, and could be expected to load onto CP. Substantively it was reasonable to allow the crossloading as Emote and CP both contribute to the posited higher order factor Cognitive Emotional Preoccupation. A subsequent model was run with this modification.

214
**Model 103**

With Emote6 free to load onto CP, $\chi^2(105) = 24.67$, NNFI = 1.27, CFI = 1.00 and RMSEA = 0.0. No further modifications were suggested by the programme. The latent factor loadings between Govern Emote and CP remained high.

**Model 103b**

As Model 103 was a satisfactory measurement model, the next step was to fit to the model the background variables age, sex and area. This resulted in an improved fit with $\chi^2(138) = 31.76$, NNFI = 1.41, CFI = 1.00 and RMSEA = 0.0. The final measurement model validated the G-TRI and is reported in detail below. Survey items can be found at Appendix 12.

<table>
<thead>
<tr>
<th>Item No</th>
<th>Govern</th>
<th>Emote</th>
<th>CP</th>
<th>CBC</th>
<th>Uniqueness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Govern9</td>
<td>.70</td>
<td></td>
<td></td>
<td></td>
<td>.76</td>
</tr>
<tr>
<td>Govern13</td>
<td>.68</td>
<td></td>
<td></td>
<td></td>
<td>.77</td>
</tr>
<tr>
<td>Govern15</td>
<td>.77</td>
<td></td>
<td></td>
<td></td>
<td>.70</td>
</tr>
<tr>
<td>Emote1</td>
<td>.77</td>
<td></td>
<td></td>
<td></td>
<td>.71</td>
</tr>
<tr>
<td>Emote2</td>
<td>.84</td>
<td></td>
<td></td>
<td></td>
<td>.65</td>
</tr>
<tr>
<td>Emote6</td>
<td>.34</td>
<td>.54</td>
<td></td>
<td></td>
<td>.68</td>
</tr>
<tr>
<td>CP7</td>
<td></td>
<td>.76</td>
<td></td>
<td></td>
<td>.71</td>
</tr>
<tr>
<td>CP11</td>
<td></td>
<td>.82</td>
<td></td>
<td></td>
<td>.67</td>
</tr>
<tr>
<td>*CP4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.66</td>
</tr>
<tr>
<td>Restrict3</td>
<td></td>
<td>.58</td>
<td></td>
<td></td>
<td>.79</td>
</tr>
<tr>
<td>Restrict10</td>
<td></td>
<td>.74</td>
<td></td>
<td></td>
<td>.74</td>
</tr>
<tr>
<td>Restrict14</td>
<td></td>
<td>.72</td>
<td></td>
<td></td>
<td>.83</td>
</tr>
<tr>
<td>Concern5</td>
<td></td>
<td>.54</td>
<td></td>
<td></td>
<td>.88</td>
</tr>
<tr>
<td>Concern8</td>
<td></td>
<td>.58</td>
<td></td>
<td></td>
<td>.83</td>
</tr>
<tr>
<td>Concern12</td>
<td></td>
<td>.71</td>
<td></td>
<td></td>
<td>.78</td>
</tr>
</tbody>
</table>

*Reassigned from CP to Cognitive Behavioural Control
The factor loadings (Table 29, page 215) for the Govern items ranged from 0.68 to 0.77. Item Govern15 (Do you find it takes considerable effort to keep your gambling under control?) contributed slightly more to the factor than other items. The degree of effort required to control gambling implies cognitive effort and it is theoretically consistent that Govern and CP will have a strong positive relationship.

Factor loadings for the Emote items ranged from .33 to .84. Feeling stressed and nervous (Item Emote6 loading at .34) was allowed to crossload onto CP, and contributed more to CP than to Emote. Stress and nervousness whilst resulting from an emotional predisposition, could be argued to be cognitive in nature as they occupy cognitive resources necessary to carry out behavioural control. CP7 (Do thoughts about gambling intrude into every-day activities?) and CP11 (Is it hard to distract yourself from thinking about gambling?) loadings were .76 and .82 respectively. CP11, degree of difficulty in distracting oneself from gambling loaded highest onto the CP factor.

Factor loadings for the items in Cognitive Behavioural Control range from .54 to .74. The strongest item relates to feelings of guilt aiding the control of gambling. The Concern items are about environmental cues to limit gambling and if it is the case that these cues stimulate guilt which prompts control attempts, it is worthwhile knowing why people believe they should not be gambling at all or as much. (Recall that this sample is mostly single and has no calls upon their income). If we know what rules they are living by, it may help to focus harm minimisation efforts in areas where they have most chance of succeeding.
Table 30: Latent Factor Correlations Between the Four G-TRI Scales and Criteria and Background Variables

<table>
<thead>
<tr>
<th></th>
<th>Govern</th>
<th>Emote</th>
<th>CP</th>
<th>CBC</th>
<th>Freq</th>
<th>Harms</th>
<th>Age</th>
<th>Area</th>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Govern</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emote</td>
<td>0.86*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CP</td>
<td>0.92*</td>
<td>0.64*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBC</td>
<td>0.72*</td>
<td>0.60*</td>
<td>0.55*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freq</td>
<td>0.31*</td>
<td>0.21*</td>
<td>0.33*</td>
<td>0.19*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harms</td>
<td>0.57*</td>
<td>0.44*</td>
<td>0.52*</td>
<td>0.41*</td>
<td>0.18*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.09</td>
<td>-0.03</td>
<td>-0.07</td>
<td>0.01</td>
<td>-0.02</td>
<td>-0.05</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>0.03</td>
<td>0.03</td>
<td>0.05</td>
<td>0.00</td>
<td>0.05</td>
<td>0.01</td>
<td>0.05</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>-0.24*</td>
<td>-0.14</td>
<td>-0.23*</td>
<td>-0.18*</td>
<td>-0.06</td>
<td>-0.17*</td>
<td>0.02</td>
<td>0.05</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*P<.05

Correlations between all four latent factors were, as expected, significant and varied from 0.55 to 0.92 (Table 30, above). The background variables age and area bore no relationship to any latent factor or criterion variable. Respondents living in Sydney answered in much the same way as those in country NSW, and younger respondents answered in much the same way as older respondents. Sex groups did differ significantly on a number of items. Negative and weak correlations were significant for males on Govern, CP, CBC and Harms. Males and females played as frequently as each other, but males reported more control difficulties and more associated Harms. Along with increased control issues males also reported greater preoccupation with controlling gambling.

The combination of control issues and cognitive preoccupation with control are the central characteristics of the AVE (Marlatt & Gordon, 1980) whereby attempts to control gambling are unsuccessful and result in a cycle of abstinence and binge behaviour. Abstinence is brought about through considerable cognitive effort, and is unsustainable for that reason. The significant, positive and strong correlations
between Govem, Emote and CP suggest that people with control issues and who are highly preoccupied with gambling, are likely to gamble due to emotional states such as anxiety and loneliness.

The significant moderate positive correlations between Cognitive Behavioural Control and the three latent factors posited to underlie the CEP higher order factor (Table 30, page 217), support the contention that gambling involves a reciprocal relationship between regulated (Cognitive Behavioural Control) and unregulated or excessive (Cognitive and Emotional Preoccupation) behaviour. In particular, the three factors forming the posited higher order factor CEP were more strongly related to higher Frequency of play and reported Harms than was the CBC factor. When environmental cues lead to thoughts about restricting gambling, and attempts are made to do so, a person is more likely to report playing less often and experiencing fewer Harms.

Degree of difficulty distracting oneself from gambling implies control issues for several reasons. Firstly, the focus on gambling interferes with daily life experiences, such as relationships which may positively reinforce the individual's capacity for control (recall gamblers do successfully manage other areas of their lives). Secondly effortful control is probably an attempt to comply with external regulation, and where externally motivated control exists in opposition to internal states, such as emotionally toned reasons for wanting to gamble, the desire to gamble is harder to overcome. For example, where loneliness precipitates gambling, cognitive preoccupation with control further alleviates the unwanted feelings of loneliness. Consequently, attempts to force oneself to cease or moderate gambling, in the absence of a strategy to counter the loneliness may be very unappealing. Unless the Harms being experienced are strong enough to overshadow the feelings of anxiety, the impetus for behavioural change is lacking. This helps to explain why help is often not sought until gambling problems become severe (Victorian Government Department of Human Services, 2001).
Second order models

Modelling was undertaken with an established theoretical precedent for fitting second order factors. The design of the G-TRI assumes that a systematic hierarchical ordering of the domains of temptation and restraint underlies the substantial correlations between first-order factors. The G-TRI measures three cognitive emotional domains (temptation) and two cognitive behavioural domains (restraint). Recall that the Restraint factors were compiled into a single factor in the initial stages of model estimation. Thus, the hierarchical structure of the G-TRI was examined by testing for the presence of a single higher order factor fitted to the Temptation factors in the model. The intent of the higher-order factor model was to explain the substantial correlations among the first-order factors, Govern, Emote and CP.

The single, second order factor model analysis yielded a $\chi^2(85) = 17.09$, an NNFI = 1.48, CFI = 1.00 and RMSEA = 0.0. Whilst the fit statistics were excellent, item 4 (Emote 1) on factor 2 (Cognitive Behavioural Control) could not be identified and thus standard errors, T-values, modification indices, and standardized residuals could not be computed. Despite efforts to provide a better set of starting values for the model, the data did not fit a higher order solution.

Correlations between criterion and background variables

Thoroughly testing a measurement instrument requires that convergence and divergence of background factors with the latent factors be examined. Consequently, age, sex and area (described on pages 204-206) are of interest from the point of view of the validity of the instrument and whether it generalises to different groups in the population. The criterion variables, Harms and Frequency were described on pages 206-207. Criterion variables, frequency of play and Harms have commonly been used as outcome variables in gambling research. There is general acceptance of a relationship between high frequency playrates and greater number of associated harmful impacts.
No significant differences occurred for sex on either background variable age or area (Table 30, page 217). Thus questions were answered similarly across country and city areas and regardless of whether respondent was of legal age to gamble or not. Frequency was significantly related to each G-TRI latent factor, but was not related to sex. Harms were also significantly related to each G-TRI latent factor, as well as to sex.

**Multiple regression analysis**

At this point in the research process a sound measurement model for a four factor version of the G-TRI had been established, but without a higher order model which would have accounted for the high correlations between the latent factors Govern Emote and CP. In the interests of parsimony, it could be argued that the three highly correlated variables could be compiled into a Cognitive Emotional Preoccupation single order factor. This was done to undertake regression analysis to test the fourth aim of the research – that Cognitive Behavioural Control predicts lower levels of gambling participation and Cognitive and Emotional Preoccupation predicts higher levels of participation.

Total scores were computed for each of the factors of the G-TRI and were then used as the basis for predicting the number of reported Harms. Multiple regression (SPSS V11: Coakes & Steed, 2003) was conducted to determine whether the two factors, Cognitive Emotional Preoccupation and Cognitive Behavioural Control, had an effect on Harms or Frequency, and whether that affect differed when adjusted for sex. The multivariate results indicated a significant effect for Harms and Frequency taken together, $F(3, 216) = 115.3; p<0.001$ for Harms and $F(3, 216) = 28.9; p<0.001$ for Frequency (Appendix 20).
Given the significant joint effects, separate hierarchical multiple regressions were performed to test the effects of Frequency (regular gambling) and reported Harms on CEP and CBC independently. Sex of the respondent was entered first in each equation to statistically control for any pre-existing differences between male and female’s self-reported playrate and gambling related problems. CEP and CBC were entered second and third respectively in each equation, and the product interaction of these two gambling Restraint factors was entered last.

**Harms**

Above and beyond the fact that men reported somewhat more Harms associated with gambling, in stepwise regression analysis (Table 31, below) sex was not a significant predictor of gambling Harms. The result was \( F(4, 216) = 88.11; p<.001 \) with Cognitive Emotional Preoccupation \( (t = 14.37, p<.001) \) and Cognitive Behavioural Control \( (t = 2.25, p<.05) \) accounting for 79% of variance in the model. The Cognitive Emotional Preoccupation factor predicted higher levels of Harms \( (\beta = 0.72) \) and Cognitive Behavioural Control factor predicted considerably lower levels of Harms \( (\beta = 0.11) \). The interaction term for Cognitive Emotional Preoccupation and Cognitive Behavioural Control approached significance.

**Table 31: Predictors of Gambling Harms**

<table>
<thead>
<tr>
<th>Predictor Variables</th>
<th>B</th>
<th>SE</th>
<th>Beta</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>-4.208</td>
<td>4.482</td>
<td>-.041</td>
<td>-9.39</td>
<td>.349</td>
</tr>
<tr>
<td>CBC</td>
<td>.434</td>
<td>.193</td>
<td>.111</td>
<td>2.215</td>
<td>.026</td>
</tr>
<tr>
<td>CEP</td>
<td>2.539</td>
<td>.177</td>
<td>.721</td>
<td>14.37</td>
<td>.000</td>
</tr>
<tr>
<td>CEPxCBC</td>
<td>-.009</td>
<td>.000</td>
<td>-.076</td>
<td>-1.771</td>
<td>.078</td>
</tr>
<tr>
<td>Constant</td>
<td>22.171</td>
<td>8.488</td>
<td>2.612</td>
<td>.010</td>
<td></td>
</tr>
</tbody>
</table>

Variance explained: 79%

**Frequency**

In stepwise regression (Table 32, page 222) frequency of play was predicted by CEP \( F(4, 216) = 87.18; p<.001 \) accounting for 54% of variance. CEP \( (t = 7.94, p<.001) \)
predicted increased frequency (β = 0.53) compared with CBC, which although not significant had a negative coefficient (β = -.05) which was in the anticipated direction of the effect. The interaction term approached, but was not significant. Neither age nor area were significant predictors of Frequency or Harms.

<table>
<thead>
<tr>
<th>Table 32: Predictors of Gambling Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predictor Variables</td>
</tr>
<tr>
<td>Sex</td>
</tr>
<tr>
<td>CBC</td>
</tr>
<tr>
<td>CEP</td>
</tr>
<tr>
<td>CEPxCBC</td>
</tr>
<tr>
<td>Constant</td>
</tr>
</tbody>
</table>

Variance explained: 54%

**Summary of findings**

The primary aim of Study 3 was to investigate the validity of adapting the A-TRI to another addictive behaviour, gambling. In doing so, either full or partial support was provided for hypotheses 1, 2 and 4:

1. Each of the five dimensions stands in its own right as a scale (Congenric models)
2. The scales are multi dimensional (CFA)
3. There are two second order factors with an anticipated relationship (second order SEM)
4. CBC predicts lower levels of gambling participation and Harms, and CEP predicts higher levels of participation and Harms (Regression).

The A-TRI was unable to be replicated exactly, however a four factor version of the model was confirmed. The Concern and Restrict factors were not sufficiently independent and were collapsed in accordance with the posited higher order factor
Cognitive Behavioural Control. Thus, the final model comprised CBC, Govern, Emote and CP. The results provide an original contribution to the psychology of gambling as they demonstrate control of gambling is complex and multifaceted, consisting of a reciprocal relationship between restricted and excessive behaviours. Cognitive and emotional preoccupation with gambling predicted a substantial increase in frequency of play. The variation in the model suggested that youth who gamble fortnightly or more often, reported relatively low levels of harmful outcomes.

In accordance with research on drinking Restraint (Collins & Lapp, 1992), the relationship between cognitive emotional preoccupation and cognitive behavioural control was consistent with the cycle of binge and restraint demonstrated in research with social drinkers. Thus, the G-TRI results support the theoretical stance that the mental processes underlying regular gambling embody a dynamic tension between temptation resulting in excessive levels of gambling and attempts at restriction. Cognitive emotional preoccupation with gambling was a risk factor for higher levels of gambling and cognitive behavioural control was associated with lower frequency playrates and fewer reported impacts.

The G-TRI encompasses the series of events explaining the control process outlined in the LMM. The CEP factors Govern (difficulty controlling gambling), Emotion (negative affect as a reason to gamble) and CP (preoccupation with thoughts about gambling or limiting gambling) were characteristics of the two higher risk groups (BL and RL). Both groups had control difficulties and commonly used gambling as an escape from negative affect. The RL group demonstrated that CP (preoccupation with thoughts about gambling or limiting gambling) led to unsuccessful attempts to restrict themselves to a limit. The cyclical pattern of limit setting (restrict) and splurging (spending all available funds) was evident in their gambling style. Whilst the Govern, Emote and CP concepts were clearly evident, the theory from which they were derived, the LVE (Collins et al., 1994), was particularly marked in the continual revisions of a target limit (RL group). Continual revisions resulted in the “what the
hell effect” (Herman & Polivy, 1980) with some youth stating it was less stressful to lose all their money early and get it over with because inevitably that would be the outcome. The effect of repeatedly exceeding their limits was that they came to believe that they could not control their gambling. The constant failures led to a hopelessness and despair and ultimately to abandoning attempts at control all together. In fact, they were externally (contingency) regulated as only a lack of money prevented further gambling.

The concern factor (plans to reduce gambling/worry about controlling gambling) of the G-TRI operated across the model and was most evident in the self-regulated gamblers who set and met their limits. These youth demonstrated a high level of awareness of gambling’s potentially addictive quality, made statements expressing these concerns, and instigated behavioural control accordingly.

The G-TRI is a broad psychometrically sound measure of gambling restraint which measures the underlying psychological process of maintaining and relinquishing control. The Temptation and Restraint concept has been validated for alcohol (Collins & Lapp, 1992) and drug use (Connors, Collins, Dermen & Kouts, 1998) and in the present study for gambling, indicating that it is a valid model across the addictions field. The G-TRI has also provided strong support for the process of maintaining and relinquishing control explained in the LMM.

**Methodological considerations and future research directions**

In order to investigate the utility of the G-TRI model a series of six models were evaluated. The purpose of the present investigation was to determine if the TRI could be fit to a gambling sample. It would be nice to be able to report that the statistical analysis confirmed this without any equivocation, however this was not the case. It was apparent from the results of each of these that none was a perfect model, each containing some improper fits, with the exception of the two factor first order model which showed good fit statistics. However, the loadings correlations, and
relations between factors are sufficient to show that there is substantial merit in this approach. All the fit indices are such that it becomes obvious that the concept should be retained, yet further work be done with developing some of the items. Given the purpose of this research, to investigate the utility of adapting a model from the addictions field to a gambling sample, the models were accepted as strong confirmation of the theoretical basis on which the original (A-TRI) model was posited. The worrisome aspect of the statistical models were of minimal concern, given the very good fit statistics and the significant improvement when the second order model was fitted.

The G-TRI has satisfactorily passed extensive testing as a measurement instrument for gambling behaviour. Not only has it been validated in a sample of non-pathological gamblers, but in a non-Pathological youth sample, where incidence of gambling related problems is relatively lower than in adult populations. Future testing of this instrument in adult samples is likely to yield even stronger results.

There was one particular methodological issue to note in the present study. A considerable limitation was that replicating the model involved working with a saturated model (discussed on page 195) in which each factor was supported by just three items. So whilst adapting the A-TRI to a gambling sample has been extremely encouraging, what is needed is to return to the basic items and work to develop a larger pool of items from which more stable factors can be developed. This is indeed, the process that was undertaken by Collins and Lapp (1992) in their development of the A-TRI. So whilst we see a good theoretical fit between the fields, it is likely that the dimensions of that fit, i.e. the items, may or may not differ somewhat. Statistical validity can then be developed to a level compatible with the theoretical validity of the G-TRI.
Chapter 11: Discussion

The critical themes of this thesis arose because of the customary practice within gambling research of applying adult findings and methodologies to youth samples. The all-encompassing question set forward in Chapter 1 was how does self-control operate in a youth sample? Using three diverse methodologies, a comprehensive understanding of the control process has been gained. In the first study within-session limit setting exposed the value standards and cognitions that assisted or hindered the control process. In the second study, by widening the context to examine individual capacity for control, it was demonstrated that psychosocial maturity, whilst important as a post hoc evaluation of self-control and related skills, could be particularly useful as a prospective indicator of potential control problems and severity. Thirdly, the cognitive and emotional themes from the preceding two studies were integrated by fitting a psychometric measure that demonstrated how relinquishing control over gambling follows from emotional preoccupation with control. The original contribution to the psychology of addictive behaviours is that the process of self-control of gambling is multidimensional, and to facilitate research, must be measured by instruments that capture the multiple dimensions evident in the conflict between temptation and restraint.

Summarising the problem

It is well known that gambling can be harmful. Even on face value, many of the harmful impacts reported by adults do apply to youth. In the field of youth gambling some theoretical and empirical associations have been made with these negative impacts. Irrational thinking (Griffith, 1990), faulty cognitions (Derevensky et al., 1996; Griffiths, 1990; Moore & Otsuka, 1999b), and illusions of control (Derevensky et al., 1996; Griffiths, 1990; Ladouceur & Dube, 1997) show it is both thought processes as well as emotional processes (Corless & Dickerson, 1989; Hills, Hill, Mamone &
Dickerson, 2001) that have strong and independent links with problem gambling. What has been relatively unknown is how the process of applying self-control operates, how and when it varies, with little also known about what the obstacles to control are, and what factors promote control. By studying control at its empirical foundations, using a qualitative approach, theoretical understandings emerged and links were made to other psychological theories. This thesis posed a process question that diverged sharply from the main body of youth gambling literature, and was therefore asked from a grounded theory perspective. Essentially the puzzle has been put together from a different set of assumptions to those existing in the dominant paradigm of mental disorders or from assumed similarities with adult findings.

The mental disorders approach (DSM-IV-RT; APA, 2000) sets out to be atheoretical. Its primary aim is to measure Pathology based on the experiences of gamblers from clinical samples. Consequently the mental disorders approach focuses on the pathos surrounding the failure to control gambling, and this approach results in uni-dimensional and therefore limited theoretical understandings of the process of controlling gambling. Dickerson and Baron (2000) argue, and this thesis concurs, that the defining characteristics of problem gamblers are so heterogeneous that ensuring independence of predictor/causal variables is fraught with difficulty.

Recent publications aiming to identify dimensions within existing DSM and SOGS scales, (e.g. Fisher, 2000; Weibe, 2000 respectively), have met with varying degrees of success. In the case of DSM-IV-RJ (Fisher, 2000) a homogenous scale resulted and argument was made for two factors when the solution was rotated. Psychometric findings from the SOGS-RA (Weibe et al., 2000) showed the SOGS-RA still remains a single dimensional screening tool. Neither instrument accounts for a process view of youth gambling now available with recent methodological advances.
In this thesis, it was therefore imperative to go back to the target population and discover the elements of the control process. In doing so, the individual experiences of the population of regular gamblers were encapsulated providing a solid empirical basis from which to commence work. This thesis presents an essentially new representation of youth gambling, reflecting a paradigm shift, based on the assumption that all individuals have the capacity for control and each person applies varying degrees of control to their many daily activities, including gambling.

Demonstrating the process of control and delineating both the cognitive component of limit setting and the interaction with the emotional component emphasized the strengths and weaknesses that youth bring to the problem of maintaining control over gambling. The evidence of ambivalent feelings attracting and repelling youth gamblers clearly shown in the Study 1 interviews was encapsulated in the subsequent quantitative Study 3 development of the G-TRI. Thus the key theoretical assertions of each research study, have culminated in a developmentally appropriate scale of youth gambling, which has criterion related validity.

The Limit Maintenance Model (Study 1)

There were very definite behaviours around the limit setting process and these resulted in several styles of limit setting each with unique characteristics. The Limit Maintenance Model shows the progression from self-regulated limits through to limits maintained by external and coercive means. The risk of associated harms increased as the degree of control declined.

There were two over-arching styles to limit setting with five variations in how limits were managed. In two of the pathways through the model limits were set and maintained, and in two pathways they were defined but not met. In the fifth pathway the intrinsic motivation to participate in activities other than gambling overcame the need to consciously define a limit.
Looking at the model (page 127) the pathways are marked blue, green, yellow, orange and red. The colour scheme defines the degree of concern associated with each of the limit setting styles, progressing from cooler colours outlining successful limit setting through to warmer colours implying greater cognitive-emotional interaction and posing a risk to the young person.

In the blue pathway respondents did not set a limit. Youth without set limits were those who had non-gambling priorities. Contrary to the suggestion that some problem gamblers (Corless & Dickerson, 1989) and some problem drinkers (Heather et al., 1993) may operate without limits, youth with no set limits were those who had non-gambling priorities, and were least likely to experience gambling related problems. These youth gambled regularly, as did all respondents, but felt no need to set a limit primarily because they knew they would become bored with gambling well before the amount spent became a consideration. These people often accompanied partners to the venues, or were part of a social group. Their control style was very clearly distinguishable from other styles of limit setting in that they experienced no conflict about ceasing a session.

The green path through the model defined a group of people who specified a target limit and either met that target limit or took steps to ensure they met it. Where there were concerns about meeting the limit, the respondent used a proactive control strategy and carried with them only the amount of money pre-allocated for that gambling session. Progression through this style of limit setting was relatively effortless (Ward et al., 1998) yet demonstrated it was an activity that must be managed and the means of managing it was through setting a limit and ensuring the right conditions existed to meet the limit.

The yellow path through the model was a middle road in which target limits were set and then revised during the session. The gambler spent up to the intended limit and
at this point a secondary limit was invoked. The defining feature of this style was that a conscious decision was made to move to the revised, secondary limit, and the secondary limit was met. For people on the yellow path the revised limit could be seen as a flexible and adaptive behaviour (Heatherton & Baumeister, 1996). Providing revision occurs infrequently, there is minimal cause for concern in this pathway. Ultimately the revised limit was maintained and therefore can be seen as a successful control outcome.

The first of the unsuccessful pathways through the model is the orange route. As for those on the yellow path, people on the orange path set a target limit and revised it during the session. Unlike those people represented on the yellow path, those on the orange path did not maintain the secondary limit, but progressed to a third, fourth, and infinite number of revisions. These orange group people were disheartened by their ultimate failure with some admitting that the target limit was an imaginary limit – they knew that they would not be able to achieve it. Thus, the control failure was not due to the absence of a limit, but arose from the belief that it could not be met in the context of dysphoric mood. The failure was reinforced by spending all their available funds, as well as using or depleting cash and credit facilities. In this pathway respondents were under-regulated (Ward et al., 1998). The standard was set but the means of achieving the standard were not available.

In the final group progressing through the red pathway the set limit had a very distinguishing characteristic to it, differing from the previous paths. Respondents in this group nominated very broad limits for the session, for example between $50 and $500. Part way through the analysis of this emergent group the reason for the broad nature of the limit became clear. Respondents had in fact hedged on defining the amount set aside for the session because they had respecified their limit from an inhibitory limit to an acquisitionary goal (Ward et al., 1998). They had decided on an amount of money that they wished to win for that session, and hence were operating
with a win limit in mind. There are a number of further points to be made about the transformed limit and related limit setting styles.

A key finding in Study 1 relates to the NSL group who set no conscious limits but recognised their limits once they were approached. This finding challenges the assumption that gamblers at the high end of the problem gambler continuum are the ones who do not set limits. The empirical data from this study showed that regular gamblers who reported no harmful impacts, were the ones who held no predefined limits. This form of gambling, which is regular and without the need for attendant cognitive effort to maintain limits can be said to be the least riskiest of all gambling styles. In contrast to impaired limits, the absence of any consciously defined limits demonstrates a process of dynamic self-regulation (Pintrich, 2000), which operates spontaneously and flexibly, and with intuitive self-awareness. Operating effortlessly (i.e. in the absence of the attendant processes of defining limits, monitoring behaviour and evaluating outcomes) yet in accordance with a set of standards or values shows exemplary self-regulation. It further indicates that control is consistent with internal values (Ward, Hudson & Keenan, 1998) and consequently the NSL group were least at risk of gambling related problems either in the present or future.

The NSL group exemplify self-regulated behaviour in which integration of thoughts and emotions has produced a synthesis making behaviour congruent with intrinsically motivated goals. Intrinsically motivated behaviours are by definition autonomous because they are experienced as emanating from one’s self. They have been internalized into one’s conflict-free sphere (Deci & Ryan, 1985; Ryan, Koestner & Deci, 1991). It is, of course, possible that some problem gamblers may also not specify any limits, however it seems likely from the preceding results that such a person may be unusual and perhaps in the category referred to by Blaszczynski and Nower (2002) as anti social impulsivist gamblers.
The orange and red paths were more strongly associated with problematic gambling and this was confirmed by analysis of the harms reported. The orange and red groups experienced greater emotional intensity around the issue of gambling to the extent that they experienced severe conflict about wanting to end a session but being unable to do so. The end point to the session was contingent upon using all their available funds. Thus, regulation of gambling behaviour occurred as a result of externally driven circumstances and both the red and orange groups were labeled ‘contingency regulated’ gamblers, denoting the absence of internally motivated standards bearing on the culmination of a session. In contrast the blue, green and yellow paths culminated in the successful application of control and these people were therefore called self-regulated gamblers.

Collapsing the limit setting pathways into two conceptual styles, contingency regulated and self-regulated gambling was therefore an accurate reflection of the data. The risk status inferred by each is supported by the layers of analysis following from limit setting styles, i.e. the integration of emotional factors and reported Harms. It was these latter elements that confirmed the delineation between contingency and self-regulated gamblers.

Given the potential for regular gamblers to rapidly cycle into and out of problematic levels of gambling (Schellinich & Schrans, 1998), the fine line between any two pathways is volatile. The yellow group, having revised once, could potentially be in-transition to the orange path, and the orange group may at times meet their limits after a single revision. Positing a progression from orange to red has good face value, i.e. moving from an inhibitory to appetitive style. However, transition from the red to orange path is less feasible because it means a return to the relative discomfort and frenetic activity of constantly revising limits.

The finer distinction made between the red and orange groups is the separation of youth whose failure to successfully apply control generated considerable emotional
distress, from the red path followed by seemingly well controlled youth with fewer apparent signs of emotional disharmony. The contingency regulated gamblers on the red path exhibited a cluster of entrepreneurial (Maddern & Dickerson, 1999) characteristics. Gambling was approached as a serious business, with sessions planned and strategies devised to meet goals. The goal and the underlying values and beliefs were false serving because they were distorted. To plan to win a certain amount on chance-determined gambling outcomes with the bank holding the edge is clearly illusory.

Players on the red path approached gambling with a work ethic, concentrating their efforts on learning skills and devising strategies to make rational decisions about their gambling (Dickerson, in press). In this Maintenance Stage of the gambling activity (DiClemente et al., 2000) behaviour is not only resistant to change, it has become a part of their self-definition (Dervensky & Gupta 1998; Moore & Ohtsuka, 2000; Maddern & Dickerson, 1999). The difference between the frenetic revisions on the orange path and the calculated behaviours of the red path could be accounted for by the entrepreneurial approach in which the red path knew that emotive and uncontrolled styles of play were potentially hazardous (Dickerson, 2002) to their goal of winning.

The young men operating in the style of the red path were mis-regulated (Ward et al., 1998) or as Coventry and Norman (1998) note, misguided. There was good evidence of cognitive distortions operating directly via the perception of their chances of winning, and indirectly through the strategies they applied to their gambling. These findings directly concurred with studies demonstrating cognitive distortions in probability (Griffiths, 1990; Dervensky et al., 1996) and independence (Ladouceur, et al., 1995) as well as the illusion of control (Moore & Ohtsuka, 1999b). The illusion manifests through inadequate understanding of probabilities, randomness and chance events. Attributions of skill are made for wins and true to conditioning principles, intermittent wins produce greater effort to replicate the skill that ‘produced’
the win. Near misses (Griffiths, 1991) further contribute to the pattern of intermittent reinforcement and this is one way in which a sense of control over random events ensues (Wagenaar, 1986).

Another way that control is misattributed is through the extension of internal locus of control to uncontrollable events. Internally controlled youth believe themselves capable of influencing their outcomes in areas of health and happiness, for example, and may inappropriately transfer this legitimate sense of control to a behaviour governed by random events (Moore & Ohtsuka 1999b). It was indeed difficult for gamblers on the red path to accept the chance nature of events, making instead, skill based attributions for wins. This may have been further exacerbated by a cross over between gambling forms. Playing table games which contain an element of skill and switching immediately to gaming machines which do not, possibly fosters the illusion of control over the latter.

The illusion of control (Langer, 1975) was very much consistent with characteristics of the red group. In several of the longer term gamblers, it was a somewhat intermittent feature as there was evidence that the cognitive distortions supporting the illusion of control were diminishing – evidence in the form of a gradual awareness of the cumulative effects of gambling. The dawning of awareness potentially heralds the downgrading of the illusions to an intense and persistent wishful thinking (i.e. pleading with a higher power) that gradually begins to give way to the acceptance of rational and factual premises about the random nature of uncontrollable chance events. A very disheartening awakening for the gambling entrepreneur.

On the blue/green/yellow paths (self-regulated) the choice to control gambling was made. Hypothetically, this choice was made by people who have fewer expectations of gambling, in that their emotional involvement with it is minimal and they articulate enough awareness of the consequences that they are able to maintain control within a session.
For the contingency regulated gamblers, relinquishing control was driven by two overarching factors. For the orange group the phenomena of continually choosing to relinquish control was more perplexing. The frustration hypothesis (Griffith, 1991) combined with the psychology of the near miss (Griffith, 1991) in which goal frustration strengthens ongoing behaviour with a view to alleviating frustration is a plausible causal sequence. From the evidence presented in Study 1, it is best thought of through the vehicle of multiple goals that exist at the choice point of whether to abandon a limit. When the effortful focus on the goals exceeds the maximum degree of difficulty, the choice reverts to ignoring the goals and taking the path of least resistance (Tice et al., 2001) i.e. to gamble. Self-regulation is insufficiently developed to support their own choices (Diaz & Fruhauf, 1991) and without external support they remain engaged in a cycle of limit failures.

There were three paths describing different styles of limit setting which were consistent and successful. Of the three, the green path provides the surest method of control, yet its potential for problems may be greater than the yellow path. The green path activates behaviour to ensure compliance with a limit, by bringing only the designated amount of money to the venue. A worrisome aspect is the need for such behavioural safeguards, implying that the urge to be uncontrolled is known to be very powerful. However, being aware of one’s potential to exceed limits is positive, particularly so when it triggers an appropriate behavioural response.

Awareness was, in fact, a central characteristic of the self-regulated gamblers. Being able to clearly articulate the harms associated with frequent gambling fostered clear connections between spending more than intended and the consequences until next pay day. Self-regulated gamblers respected money and acknowledged the effort required to earn it.
People can only regulate themselves successfully if they pay attention to what they are doing or have some other way of acquiring knowledge of their responses (Tice & Bratslavsky, 2001). In order to regulate behaviour, people must first recognize that they are behaving in an angry manner, for example. With such awareness comes self-monitoring; deliberate attention to aspects of one's behaviour (Kanfer, 1977) during which we make judgments about whether or not we are moving closer to our goal or maintaining our standard. For the self-regulated gambler this feedback loop (Schutz & Davis, 2000) heightened awareness about distance from the goal, and this information encouraged further self-regulatory response.

The fundamental core on which awareness was based was a rational perspective on the probability of winning and even a pessimism about winning (Moore & Ohtsuka, 1999b). Frequent comments from the green and yellow people outlining the probability of winning at gambling demonstrated that they approached the activity as fun, not because they expected a particular outcome; in fact, if anything they expected to lose. The self-regulated gamblers were indifferent to gambling because they derived satisfaction and enjoyment from other activities. The impetus to limit gambling arose from the enjoyment of these activities which they were intrinsically motivated to do. Moore and Ohtsuka (2000) suggested that certain types of leisure activities mitigate against problem gambling and may encourage adaptive development. The capacity to enjoy oneself and derive pleasure from psychologically nourishing activities is indeed a developmental hallmark of psychological and social maturity.

In the latter two stages of developing the LMM the interplay between emotion and control was outlined. The present study has provided fine detail that extends the understanding of the way that emotion contributes to relinquishing control of gambling, even for self-regulated gamblers. Contingency regulated gamblers reported simply an emotional impetus to relinquish control whilst the self-regulated gamblers discussed both the substantive issues of falling to control gambling and
their feelings about the struggle to resist the temptation to gamble further. The former were caught in an emotional-cognitive tug-of-war between wanting to gamble and wanting to limit gambling. Notably, when contingency regulated gamblers were able to rationally assess the costs of gambling, the goal conflict they experienced about gambling was all the more salient. The effect was to increase the pressure for control, at which point the contingency-regulated succumbed and failed to meet their limit.

A key difference in the quality of emotions between contingency and self-regulated gamblers was whether the emotions were episodic as in the self-regulated group, or chronic as for the contingency regulated group. In the former, the emotional response was clearly linked with a specific temporal event that caused them to gamble, and most importantly there was full awareness of the link (e.g. refer to Andrew’s comments on page 109). Thus, the self-regulated gamblers understood their felt emotions around a particular event and how they lead to gambling. The contingency-regulated on the other hand were so preoccupied by pressure point decisions about controlling gambling that any understanding about how their emotional response contributed to failure was rare.

The awareness of the emotional response in the self-regulated group had a positive flow on effect. There were two ways in which it worked. Firstly, having violated a limit once, the standards and values surrounding the limit were brought to mind and one’s anger/concern about the lapse motivated an improved behavioural response. Secondly, when the lapse in control was relatively minor, a gentle and healthy reaffirmation of values occurred. These events lead to proactive behavioural strategies, such as carrying only a limited amount of cash, to ensure control was maintained.

Contingency regulated gamblers showed evidence of more intensity around their emotions than self-regulated. They were predominantly focussed on their inability to
cease gambling, and consequently repeatedly derided themselves for their failures. As preoccupation with negative emotions escalated, there was an associated decrease in the successful implementation of rational, goal-oriented behaviours to successfully control gambling. The struggle, or emotional-cognitive tug-of-war between control and control failure culminated in many contingency regulated gamblers becoming resolved to failure.

**CASPM (Study 2)**

One of the key tasks of maturity is successfully integrating emotional responses and cognitive thoughts into balanced and socially acceptable behaviours. The Content Analysis Scales provided a way of looking at this aspect of the individual gambling context.

Self-regulated gamblers scored higher on psychosocial maturity than contingency regulated gamblers. Control based on consistent and positive psychosocial maturity, combined with the ability to set and maintain limits, was successful, even when the respondent was a regular gambler. Thus, the combination of skills is responsible for the generally stable gambling pattern evidenced.

The Eriksonian dimension of Autonomy was hypothesised to distinguish respondents with impaired control from those succeeding at control. The Autonomy scores of self-regulated gamblers were considerably higher than those of contingency regulated gamblers. Autonomy is the second of Erikson's stages, and manifests as a sense of free choice, along with pride in one's independence. Highly autonomous behaviour includes decision-making, and particularly self-control that is manifest without loss of self-esteem. Making decisions based on one's own beliefs promotes a positive self-construct and sense of agency. The key construct of autonomy is "I am what I want to be" and more aptly for gambling, "I can limit my behaviour/spending in the way that I believe I should".
Lower scores on Autonomy then has two implications. Firstly they suggest that the youth has not sufficiently developed the capacity for self-directed behaviour and is therefore less likely to be able to apply a limit to gambling even when they believe they should. Secondly, it has implications for the need to further develop psychosocial skills.

The relationship between Autonomy and gambling is best explained through the relationship between autonomy and self-regulation. In Chapter 7, autonomy was defined not just as gaining freedom and separation from authority structures, but also as the capacity for making decisions about one’s own life, taking responsibility for behaviour and maintaining supportive relationships (Holmbeck cited in Collins, Laursen, Luebker & Ferreira, 1997, p.162). Because autonomy implies striving towards the ideals of self-direction and independence, it is a component of self-regulation (Maccoby & Martin, 1989), which more explicitly includes behavioural self-management, i.e. maintaining self-direction in the face of external pressures. The development of this skill would benefit youth gamblers who believe they should limit their gambling but have been unable to do so, and would do much to address the dysphoric mood that arises from limit setting failure and the subsequent belief that one is unable to control one’s gambling.

The second consideration, Autonomy, is the base from which further psychosocial stages can be developed. The capacity to act autonomously will enhance the chances of a healthy integration of other psychosocial stages, e.g. initiative, with its obvious implications for career development.

Completing education and building careers requires a high level of Autonomy, and when Autonomy is under-developed and pressure to control gambling escalates, the cumulative effects of the demands lead to abstinance violation effects no alternative but to relinquish control in some sphere (Diaz & Fruhauf, 1991). When supported by other
well-developed stages of psychosocial skills, the outcome could potentially be very different. The skills directly associated with self-control are located within the Autonomy developmental phase, yet it is apparent that setting and maintaining limits requires more than the ability to act autonomously. Limit setting requires an intrinsically motivated reason to apply and maintain control, and the cognitive and emotional resources to sustain it, i.e. psychosocial maturity.

The contingency regulated gamblers scored significantly higher than the self-regulated gamblers on Initiative, coinciding with their entrepreneurial nature and drive for achievement. Achievement issues were a major consideration for the majority in this sample. A consistent characteristic of the contingency-regulated gamblers was a feeling of having failed to meet others’ educational or career goals for them, and sometimes failing to achieve their own possibly unrealistic goals. From a developmental perspective, gambling may have been an attempt to solve the problem of achievement. Making skill based attributions for gambling wins possibly creates a feeling of success when a win occurs, but as the skill component is, at best, minimal, it cannot create a sense of one’s self as having achieved via personal effort and mastery. Self-regulated gamblers, who had good autonomy skills, were more industrious than contingency regulated gamblers; they were good at, and derived satisfaction from doing other things. Consequently, they were more successful in solving the achievement issue.

Respondents who felt they had failed to meet others’ educational or career goals for them had poor quality relationships with parents. It was demonstrated that respondents who reported good quality relationships with parents were much less likely to be experiencing difficulties controlling gambling. These two points underscore a very convincing argument, proposed by Diaz and Fruhauf (1991) that addictive-like behaviours are an outcome of problems that have occurred in the transfer of power from parent to child. Interruptions to this learning process, for whatever reason, compromise independence and further development (Collins, et al., 1997). In the case of addictive behaviours, these early socialisation patterns are
important markers of the capacity to develop self-regulation in later life. In fact, the severity and duration of an addictive behaviour varies according to the level of self-regulation that a person has achieved (Diaz & Fruhauf, 1991).

Temptation and Restraint (Study 3)

For the purposes of this research, the self-regulation models drawn on have illuminated the multiple aspects and degrees of control and in particular highlighted the tension between wanting to gamble and wanting to abstain. The empirically grounded propositions have been well supported by the self-regulatory literature and the developmental literature. To further validate the empirical concepts discovered, the interplay of emotions and cognitions in the control process, were tested via a model measuring attempts at control. The model was chosen on the basis that it was a parsimonious representation of the concepts arising from the preceding research studies. Further, it added strength to the study of control by virtue of its contrasting positivist methodology.

The primary aim of the third study was to investigate the validity of generalising the Temptation and Restraint Inventory to a sample of regular gamblers. The G-TRI performed in accordance with drug and alcohol studies (Collins & Lapp, 1992), with higher scores on the Cognitive and Emotional Preoccupation factor predicting greater incidences of Harms and higher scores on the Cognitive Behavioural Control factor predicting fewer gambling related problems.

In the G-TRI a four factor version of the original A-TRI resulted, comprising Govern, Emote, CP, and Cognitive Behavioural Control. The Concern and Restrict factors were not sufficiently independent and thus were collapsed in accordance with the posited higher order factor Cognitive Behavioural Control. This outcome was consistent with recent work using the A-TRI (Collins, Koutsy & Izzo, 2000) and this
provided a comprehensive, psychometrically sound measure of gambling Restraint, tested and validated in a youth sample aged 16 to 24 years.

The relationship between Cognitive Emotional Preoccupation and Cognitive Behavioural Control of gambling showed a similar pattern of results to the cycle of binge and restraint evident in research with social drinkers (Collins & Lapp, 1992). Thus, the results support the theoretical stance that the mental processes underlying regular gambling embody a dynamic tension between positive attraction, i.e. temptation, resulting in excessive levels of gambling, and restraint, involving a cognitive preoccupation with control. Cognitive emotional preoccupation with gambling is a risk factor for higher levels of gambling, predicting substantial increases in frequency of play and cognitive behavioural control is associated with lower frequency playrates and fewer reported impacts.

The results provide an original contribution to the psychology of gambling as they demonstrate that the process of self-control of gambling is complex and multifaceted, and cannot be viewed unidimensionally. The success of the model confirms that control involves both a propensity to restrict participation as well as a tendency to splurge. Therefore, unsuccessful and successful attempts at control of gambling are important considerations when dealing with problematic gambling behaviours of youth.

The young adults in the sample reported life stresses which they experienced as all-consuming, and it was these stresses that provided the major impetus to gamble. Issues, such as relationship difficulties, (particularly with parents), dissatisfaction with living situations, lack of gainful employment, and financial uncertainty being the foundations of the stress, anxiety, nervousness and loneliness measured by the G-TRI. The added burden and intensity of these emotions, and the associated unresolved events, made the application of control problematic as there are limits to human cognitive resources (Pintrich, 2000).
This notion of limited cognitive resources is well established within goal theory literature (Baumeister, 1997; Muraven & Baumeister, 2000; Pintrich, 2000; Ryan & Solky, 1996) and has been formally tested in an experimental study of alcohol consumption. In simultaneously carrying out an effortful thought suppressing task whilst restraining oneself from drinking, an interaction between conditions was clearly identified (Muraven, Collins & Nienhaus, 2002). It was significantly more difficult to apply control when engaged in thought suppression. The overarching theoretical stance in the article was of self-control strength (Baumeister, Bratslavsky, Muraven & Tice, 1998) and the possibility that it is diminished by prior control efforts.

The implications of this study are as innovative for gambling as they have been demonstrated to be for alcohol research (Collins, Koutsy & Izzo, 2000). Being preoccupied with an activity, i.e. control of gambling, predisposes the person to lose control, as a result of competing cognitive demands. However it is not just preoccupation with gambling control that depletes resources. Having one's control-strength continually drained by chronic and effortful problems demanding one's attention, is another way in which the capacity for control is eroded.

The depleted resources argument fits well with the control apathy often demonstrated by problem gamblers and clearly evident amongst youth who continually revised target limits. One explanation for how the Temptation and Restraint dynamic is perpetuated comes from the abstinence violation effect (Marlatt & Gordon, 1980) upon which the A-TRI was premised. Research into drinking restraint was originally undertaken by Ruderman and McKirnan (1984) to test the abstinence violation effect. However, it was not just abstinence that presented a pressure point choice but also self-imposed limits. Consequently, the abstinence violation effect was reformulated to the Limit Violation Effect (Marlatt, 1985). Marlatt hypothesised that restrained drinkers who were mostly successful at self-imposed limits, may experience the Limit Violation Effect whereby failure of a limit triggers a binge. For gambling the Limit
Violation Effect suggests that excessive gambling occurs when restrained gamblers blame themselves for the violation, react with negative affect to the violation and then gamble to repair their mood. In this manner a negative cycle of restraint, violation and excessive gambling develops over time just as it does for drinkers (Marlatt, 1985).

The limit violation hypotheses has good face validity in gambling and describes the process that places restrained gamblers at risk. It is plausible for the yellow and orange groups and provides a particularly plausible explanation for movement from the orange path to the red. The movement from orange to red demonstrates one means of solving the Limit Violation Effect. Constant failure to meet a limit (orange path) sets up a cycle of self-blame and negative affect, resulting in more gambling to repair mood. At this point gambling participation may increase. In an attempt to eliminate constant limit failures and to repair the negative affect that results, the limit is reformulated into a win limit. This strategy provides a way to alleviate the negative affect, even if only temporarily.

Limitations of the study

The current study took an exploratory approach to youth gambling placing particular emphasis on qualitative research in which youth were free to express themselves without the constraints of quantitative methods. This approach was taken to ensure the 3 studies were empirically grounded, i.e. that a true representation of youths’ experiences was presented, from the ground up. The model developed from the interview data (Study 1) was validated by reference to the self-regulatory literature and located in the context of psychosocial development literature (Study 2). The key theme of limit violation was then tested in the SEM model on Temptation and Restraint. This provided a ground-up analysis with multiple perspectives on how youth maintained and relinquished control over gambling. This has not been done before in this area of study.
The methods and instruments used were not infallible and some qualification of their use and limitations is required. The advantages of using mixed methods was argued strenuously in Chapter 4. The contribution of the qualitative foundations to the quantitative model demonstrated the importance of the mixed methods approach. This thesis has shown how qualitative methods can be used to strengthen and hone quantitative studies, and has also demonstrated their robustness as an independent method of inquiry.

One of the disadvantages of the mixed methods approach is that the research process does not unfold neatly into the formulaic output of a quantitative thesis. Nor is literature extensively reviewed prior to analysis in the grounded theory approach. Rather, the researcher looks to the existing literature to explain the findings from the analyses, and validation occurs through the goodness of fit to that literature. Further questions sometimes asked of qualitative methods of enquiry relate to a) issues of representativeness and b) issues related to self-report data.

a) Representativeness: In order to draw a random sample, a population must first be defined. It is very probably impossible to define the population of youth gamblers and therefore strategically it is impossible to draw a random sample. More importantly, qualitative studies do not aim to be random nor representative of the entire population. Theoretically, the aim is not to predict to a population, but to identify detailed processes within a subset of the population. These findings can then be tested in a larger, random and representative sample, as was done in the quantitative study (Study 3). This issue is considered in greater detail in Study 2 (below).

b) In relation to the issue of self-report data, research has shown that there is generally good consistency between self-reported data and objective ratings made by others (e.g. Marsh, 1990). This is an area worthy of further investigation in the
future, however it should be noted that the triangulation that occurred between qualitative and quantitative methods has provided validation of the data. From a quantitative perspective this limitation is noted. From within the qualitative paradigm, it is precisely because humans are unreliable, omit information, and provide slanted versions of events that the qualitative analysis does not take self-reported statements at face value. In developing the coding structure for the interviews the meanings of people’s utterances were examined and re-examined to distil meanings in context and in relation to other concepts. This was discussed in the important section entitled “Writing Qualitative Studies” on page 76. Further, whether the information is reliable or not reliable, it is the participant’s perception that is important and provides the basis from which we must begin to design new psychometric instruments if they are to be empirically sound.

Each of the studies are now considered in relation to their strengths and weaknesses.

**Study 1**

The qualitative interviews conducted in Study 1 enabled a full enquiry into the social world and the individual human experience. The aim was to provide new insights about how gamblers maintain control over gambling. In Study 1 individual differences in behaviours and the context of those differences were examined to provide a model that charted 5 different processes (pathways) of control of gambling. From a quantitative perspective, the limitations of this type of research are the small sample size, and consequently (as discussed above) the question of representativeness. In essence, can we generalise from the Limit Maintenance Model to the general population? One way that qualitative methods addresses representativeness is by applying “saturation” (Guba & Lincoln, 1998), a term used to denote the point at which interviews are no longer providing new insights into the behaviour in question. Saturation is usually reached well before the twentieth interview has been analysed. Reaching saturation provides confidence that all
participants’ views have been represented. However, the subset of the population being represented could potentially be biased. There are two ways to address such potential bias. The first is to look to the literature to examine how the model sits in relation to existing knowledge. If findings in the model can, for the most part, be explained by the existing literature, there can be some degree of confidence that the model is a credible reflection of the experiences of participants. In such a case, the next step is to design a quantitative instrument to test the themes proposed by the qualitative study, and to administer that instrument to a representative sample.

Through this process, a model is generated from the ground up and is empirically responsive to the sample population. However, on its own, a qualitative study requires further testing before its findings can be generalised to the greater population. In this thesis, themes from the qualitative model were tested in a quantitative model.

Study 2

In Study 2 the developmental achievements of youth were measured in relation to their experiences with gambling. Specifically the capacity for self-regulation was related to respondents ability to set gambling limits. There were a number of different options that presented for measuring development. Numerous psychometric scales exist which measure psychosocial development. Many, such as the Psychosocial Inventory of Ego Strengths (Markstrom, Sabino, Turner & Berman, 1997) are either in the early stages of validation or have been validated on small samples, or do not fit the age range of the current study. The Student Developmental Task and Lifestyle Assessment (Winston, 1990) received consideration as it had good reliability and validity statistics (Wachs & Cooper, 2002) however it was not appropriate for a sample containing 15 full-time workers. Representing psychosocial development through the CASPM overcame age inequities as well as providing an interview format in which youth could express themselves freely, whilst the researcher applied a highly prescribed and tested
analytic method. Further this format provided access to both the negative and positive aspects of youths’ experiences of gambling control. Because content analysis is soundly based on a time honoured theory proposed by Erikson (1959) any of the potential disadvantages of the method were thought to be adequately compensated for.

For example, the inter-judge reliability coefficient for this study was slightly lower (.83) than the .85 set as a minimum requirement. As such, the method requires a high degree of training and experience to apply the coding rules accurately, and any disagreement on coding of interviews has the potential to compromise the methodology.

Further, if there is an inexactness to this method, it is in the reduction of a wide set of key propositions to a coding scheme that is rigorous and systematic. This has been relatively successful and Australian norms have been established for CASPM. However, as with survey instruments, the methodology requires ongoing test and retest trials over time. In particular, its status as a projective test is in the early stages of development. The ongoing group-work on recidivism in youth offenders (Viney & Henry, in press) is a good basis for further developing the method in an age-relevant field.

Finally, in Study 2 a statistical significance level of .05 was adopted. Given the exploratory nature of the thesis and that quantitative statistics are not easily applied to relatively small scale qualitative data, the use of the .05 level has provided some direction in understanding developmental differences. The current study provided a base to work from (i.e. a set of hypotheses could now be generated and tested) and therefore more conservative probability values would be appropriate in future research.
Study 3

The G-TRI satisfactorily passed extensive testing as a measurement instrument for gambling behaviour in a nonpathological youth sample. The statistical limitations to the model were discussed at page 244, however one particular methodological issue was that the A-TRI was a saturated model (discussed on page 195). Taken together with the unsuccessful fit of a higher order model, it is likely that the dimensions of that fit, i.e. the items, may differ from the original items. What is needed, therefore, is to return to the basic items and work to develop a larger pool of items from which more stable factors can be developed. Adapting the A-TRI to a gambling sample has been extremely encouraging, and has confirmed the utility of a model adapted from alcohol studies.

Sample size was of concern in Study 3. In gambling research there are inherent difficulties with sample size, given the relatively small proportion of the population that gamble weekly or more often. The number of regular gamblers occurring in the random sample of 1008 was less than expected from the prevalence estimates calculated on page 190. Future research studies would be wise to consider cost-effective ways of randomly sampling a larger proportion of the population in order to gain a larger pool of regular gamblers for analysis.

In conclusion, the implications of the current study for gambling research are that there are multiple dimensions inherent in youth applying self-control to gambling, and these dimensions interact. It is at the point of interaction that new insights can be gained and progress can be made in the field: It can be determined which characteristics are working for and against youth in supporting their self-regulatory attempts to control gambling. It is from such multifaceted research that interventions can be developed to enhance any protective skills youth have and develop those they do not.
Final comment on self-control

The conceptualisation of control has been through many reformulations, but has remained a central theoretical construct in the addictive behaviours dating from 1968 (Miller & Brown, 1991). The reframing of control as degrees of impairment that varied (Heather, Tebutt, Mattick & Zamir, 1993) substantially altered research and thinking about alcohol and has the potential to impact on our understandings of problem gambling. We now know that control can be switched on and off at different times; people choose to apply it to varying degrees and the motivation to apply it varies enormously.

Constructing continuous measures of impaired control has been another useful stepping stone. Indicators of impaired control, spending more money or time than planned and continuing for longer than planned, are being examined prospectively in regular gamblers (Dickerson, 1987; Moore & Ohtsuka, 1997) enabling researchers to monitor progress towards problems rather than measure it at its end point. Arising from this shift in measurement principles, is a further milestone. Separating the harms from the behaviour (Dickerson, 2000) allowed researchers to begin to specify the necessary and sufficient conditions of controlled gambling (Corless & Dickerson, 1989) independent of the consequences, and to examine the variables that maintain and erode control.

Perhaps the most important advance, however, occurred through the more direct measures of control, such as those in the Scale of Gambling Choice (Baron et al., 1995). Consisting mainly of self statements such as: lost more than intended; spent more than planned and found it hard to give up or stop (Dickerson, 1993), the scale enhanced awareness of the way in which a person's gambling does not meet some preferred standard and/or an awareness that even with effort, such a standard cannot consistently be achieved.
The shift to utilising the individual's own value system, with impaired control defined as difficulty or failure to achieve certain standards, has meant that measurement relies heavily on unstated standards for behaviour (Dickerson, 1993). To improve the accuracy of this research approach, the nature of the standard requires specification. By identifying the goal, an individual may come to know what they require of themselves in terms of self-control. This is important because the self-control process requires not only a knowledge of the standard, it also requires knowing how to achieve the standard.

With a behavioural standard specified it is possible to identify the differences and interactions between knowing how to apply control and maintaining control in taxing circumstances. This assumes that control is a capacity that all people demonstrate in various areas of their lives and that a major cause of impaired control is due to the control-strength (Baumeister, Bratslavsky, Muraven & Tice, 1998; Muraven, Collins & Nienhaus, 2002) of the individual, which is eroded by functional demands.

Control-strength has collectively measured variations of self-control in alcohol research (Muraven, Collins & Nienhaus, 2002) and provides a good fit to existing gambling literature. Control strength has been shown to vary with the emotional predisposition related to need to escape (Gupta & Derevensky, 1998) the quality of thinking (e.g. Griffiths, 1990; Moore &Ohtsuka, 1997) and the self-regulation capacity and psychosocial skills arguments put forward in this thesis.

Acknowledging the considerable demands for control placed upon the individual, the argument for choice in control behaviours (Baron et al., 1995) is then very plausible. Choices can be observed as one's motivations and intentions within a particular context become apparent. Given people whose lifestyles include pressures to perform that severely tax their resources, relinquishing control of gambling may be very attractive, especially because they perceive themselves to be engaged in a leisure activity whose essential nature is about relaxing control and enjoying oneself.
after a hard day. Indeed, exerting the effort needed to maintain control is antithetical to the relaxation required of a leisure activity (Dickerson, in press).

Research identifying the multiple variations in the circumstances under which impaired control may occur has laid a foundation for generating theory building explanations of addictive behaviours (Dickerson & Baron, 2000) and suggests that, as in other addictive behaviours, loss of control is a misnomer. Rather, the ability to exert control varies between and within individuals from one occasion and context to another. This proposition is very well supported by the three empirical studies in this thesis. In the Limit Maintenance Model it would be improbable to suggest that movement between the paths did not occur. Which path best models the gamblers’ behaviour on that day can be inferred by a state measure of developmental skills which by their very nature, vary depending on circumstances. Further, the oscillation between successful and less successful control behaviours, formally measured by the Gambling Temptation and Restraint Inventory, shows that some degree of impaired control is very common.

Also compatible with the current literature is the argument that the experience of strong emotional/physiological responses during a session of play is a natural human experience (Dickerson, in press). Being able to continue to make controlled, informed, and rational decisions about play in a session of continuous gambling, is a context in which cognitive behavioural control will be severely taxed - particularly if there is preoccupation with control or emotional stress occurring simultaneously. In all likelihood, for youth to maintain control under these conditions a high level of developmental skills training would be required. Further, the notion of youth relinquishing control of a potentially harmful leisure activity is alarming. If gambling is a time-out coping strategy, young people need help to embark on the learning that will enable them to move into and out of control - a mature and adaptive self-regulatory capacity (Heatherton & Baumeister, 1996).
In the spirit of individual differences in psychology, this thesis work has explored human potential and difficulties with control of gambling. In the broader reality, government regulatory bodies determine the shape of the landscape within which self-regulation can or may operate to protect the individual from harmful impacts.

To return to the question posed at the beginning of this thesis (page 2): What will be the outcome of the choice point reached by the three young men who have just had a win and were divided about whether to continue gambling. The third young man has a set limit and his self-regulatory skills are sufficiently supported by his psychosocial maturity that the temptation to continue is relatively easy to overcome. The other two often spend all their money on gambling during a night at the club. They sometimes worry about limiting their gambling and argue about it with parents/girlfriends from time to time. In their case the temptation to continue gambling is too great to be overcome, especially because one is feeling optimistic and the other depressed/angry, and also because they think their winning strategy might finally have worked.

Their outcomes depend on key factors from Studies 1, 2 and 3: The strength of their self-regulatory capacity i.e. desire to set and maintain gambling limits, and the extent to which their psychosocial skills are sufficiently developed to avoid temptation and sustain the self-control process.
Reference List


257


Dickerson, M. G., Baron, E., & O'Connor, J. (1994). *A report to the Department of Racing and Gaming: Measuring the extent and degree of gambling related problems in Western Australia*. Department of Racing and Gaming, WA.


262


265


277


Appendix 1

Australian Problem Gambling Harms, SOGS, SOGS-RA and DSM-IV-MR-J items
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Frequent preoccupation with gambling or obtaining money to gamble</td>
<td>Preoccupation - thinking about or planning to gamble</td>
<td>Betting caused problems such as arguments with family or friends, or problems at work or school</td>
<td>I have felt that my gambling was a problem</td>
<td></td>
</tr>
<tr>
<td>2 Need to increase the size or frequency of bets to achieve the desired excitement</td>
<td>Tolerance - bolsters excitement by increasing stakes</td>
<td>Told others you were winning when you weren't</td>
<td>When I've lost gambling, I've bragged about winning</td>
<td></td>
</tr>
<tr>
<td>3 Repeated efforts to cut down or stop gambling</td>
<td>Loss of control - unsuccessful attempts to reduce or stop</td>
<td>Like to stop betting but didn't think you could</td>
<td>I've felt like stopping but didn't think I could</td>
<td></td>
</tr>
<tr>
<td>4 Restlessness or irritability if unable to gamble</td>
<td>Withdrawal - Reduction creates restlessness/irritability</td>
<td>Gone back another day to win back lost money</td>
<td>After losing I've gone back to win back money lost</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Escape - relieves dysphoric mood</td>
<td>Gambled more than planned to</td>
<td>When I've gambled I've gone on for longer than planned</td>
<td></td>
</tr>
<tr>
<td>6 Repeatedly loses money gambling and returns another day to win back losses</td>
<td>Chasing - returns to recoup losses</td>
<td>Felt bad about the amount bet or what happens when you bet money</td>
<td>When I finished gambling I felt guilty</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Lies - conceals extent of gambling</td>
<td>Arguments about money with family or friends that centred on your gambling</td>
<td>My gambling has caused arguments about money with family/friends</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Hidden signs of gambling from friends/family</td>
<td>I have hidden betting slips, lottery tickets etc. from family or friends</td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------------------------------</td>
<td>-----------------------------------------------------------</td>
<td>--------------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>10 Often gambles when expected to fulfill social, educational or occupational obligations Has given up some important social, occupational or recreational activity in order to gamble</td>
<td>Risks job, education, or relationship - jeopardized or lost</td>
<td>Work Related</td>
<td>Skipped or been absent from school or work due to betting</td>
<td>I've lost time from work or study due to gambling</td>
</tr>
<tr>
<td>11</td>
<td>Borrowed money or stolen something in order to bet or cover gambling debts</td>
<td>Financial</td>
<td>I've borrowed money to gamble or pay gambling debts</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Bail out not applicable to adolescents - borrows to cover gambling debts</td>
<td>Borrowed money and not paid it back</td>
<td>I've borrowed money and not paid it back for gambling</td>
<td>If borrowed money, from whom? (score 1 for each of 11 possible sources)</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>Largest amount ever gambled in past 12 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>Do you think either of your parents gambles too much</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-----------------------------------------------</td>
<td>-------------------------------------------------------------</td>
<td>---------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Continues to gamble despite inability to pay mounting debts, or despite other significant social, occupational, or legal problems that the individual knows to be exacerbated by gambling.</td>
<td>Illegal or unsocial acts - stealing or use of money intended for other purposes</td>
<td>Illegal Acts</td>
<td>No items</td>
<td>No items</td>
</tr>
</tbody>
</table>
Appendix 2

The South Oaks Gambling Screen and
DSM-IV Survey Items
The South Oaks Gambling Screen: The Lifetime Version

1. When you gamble, how often do you go back another day to win back money you lost? (never; some of the time [less than half the time] I lost; most of the time I lost; every time I lost)

2. Have you ever claimed to be winning money gambling but weren’t really? In fact you lost? (never or never gamble; yes, less than half the time I lost; yes, most of the time)

3. Do you feel you have ever had a problem with gambling? (no; yes, in the past, but not now; yes)

4. Did you ever gamble more than you intended to? (yes, no)

5. Have people criticised your gambling? (yes, no)

6. Have you ever felt guilty about the way you gamble or what happens when you gamble? (yes, no)

7. Have you ever felt like you would like to stop gambling, but didn’t think you could? (yes, no)

8. Have you ever hidden betting slips, lottery tickets, gambling money, or other signs of gambling from your spouse, children or other important people in your life? (yes, no)

9a. Have you ever argued with people you live with over how you handle money? (yes, no)

9b. If you answered yes to the previous question: Have money arguments ever centred on your gambling? (yes, no)

10. Have you ever borrowed from someone and not paid them back as a result of your gambling? (yes, no)

11. Have you ever lost time from work (or school) due to gambling? (yes, no)

If you borrowed money to gamble or pay gambling debts, who or where did you borrow from? (check ‘yes’ or ‘no’ for each).

12. From household money? (yes, no)

13. From your spouse? (yes, no)

14. From other relatives or in-laws? (yes, no)

15. From banks, loan companies, or credit unions? (yes, no)

16. From credit cards (yes, no)

17. From loan sharks? (yes, no)

18. You cashed in stocks, bonds or other securities? (yes, no)

19. You sold personal or family property? (yes, no)

20. You borrowed on your checking account (passed bad checks)? (yes, no)

Scores are as follows. On question 1, score 1 if most of the time or every time I lost. On question 2, score 1 if less than half the time I lost or yes, most of the time. On question 3, score 1 if yes, in the past, but not now or yes. Ignore question 9a. On all remaining questions score 1 if a yes. A score of 5 or more suggests a person is a ‘probable pathological gambler’ using the US nomenclature, and a problem gambler in Australia.

The DSM-IV

A. Persistent and maladaptive gambling behaviour is indicated by five (or more) of the following:
   • is preoccupied with gambling (eg preoccupied with reliving past gambling experiences, handicapping or planning the next venture, or thinking of ways to get money with which to gamble);
   • needs to gamble with increasing amounts of money in order to achieve the desired excitement;
   • has repeated unsuccessful efforts to control, cut back, or stop gambling;
   • is restless or irritable when attempting to cut down or stop gambling;
   • gambles as a way of escaping from problems or relieving a dysphoric mood (eg feelings of helplessness, guilt, anxiety, depression);
   • after losing money gambling, often returns another day to get even ("chasing one’s losses);
   • lies to family members, therapists or others to conceal the extent of involvement with gambling;
   • has committed illegal acts such as forgery, fraud, theft, or embezzlement to finance gambling;
   • has jeopardised or lost a significant relationship, job or educational career opportunity because of gambling;
   • relies on others to provide money to relieve a desperate financial situation caused by gambling.

B. The gambling behaviour is not better accounted for by a manic episode.

The DSM-IV is a set of clinical criteria. On some occasions it has been implemented as a prevalence test. For example, the National Gambling Impact Study Commission used the criteria in a set of questions — the NORC DSM-IV Screen. The screen was implemented for people who has lost more than $100 in a one day or across a year. A person getting a score of 1-2 is termed 'at risk, a person scoring 3-4 is termed a problem gambler, while a person scoring 5 or more is termed a ‘pathological’ gambler.

Appendix 3

Prevalence Rates from Youth Gambling Studies
<table>
<thead>
<tr>
<th>Author</th>
<th>Publication Date</th>
<th>Location</th>
<th>Instrument</th>
<th>Sample</th>
<th>Age</th>
<th>Prevalence Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesieur &amp; Klein</td>
<td>1987</td>
<td>New Jersey</td>
<td>Pathological Gambling Signs Index ((PGSI)³)</td>
<td>892</td>
<td>Grade 11-12</td>
<td>5.7%</td>
</tr>
<tr>
<td>Ladouceur &amp; Mireault</td>
<td>1988</td>
<td>Quebec City</td>
<td>PGSI³</td>
<td></td>
<td></td>
<td>3.6%</td>
</tr>
<tr>
<td>Fisher</td>
<td>1992/93a</td>
<td>England</td>
<td>DSM-IV-J ⁷ ⁸</td>
<td>467</td>
<td>11-16</td>
<td>5.7%</td>
</tr>
<tr>
<td>Winters, Sintchfield &amp; Fulkerson</td>
<td>1993</td>
<td>Minnesota</td>
<td>SOGS-RA ⁹ ¹⁰ ¹¹</td>
<td>702</td>
<td>15-18</td>
<td>8.7% + 17.2% at risk</td>
</tr>
<tr>
<td>Volberg</td>
<td>1993</td>
<td>Washington</td>
<td>SOGS ⁹</td>
<td>1,054</td>
<td>13-17</td>
<td>0.9% +11.5% at risk</td>
</tr>
<tr>
<td>Shaffer et al</td>
<td>1994</td>
<td>Mass</td>
<td>MAGS ⁶</td>
<td>699</td>
<td>13-20</td>
<td>6%</td>
</tr>
<tr>
<td>Govani et al.</td>
<td>1996</td>
<td>Ontario</td>
<td>SOGS-RA ⁹ ¹¹</td>
<td>965</td>
<td>14-19</td>
<td>8.1% 1.8%</td>
</tr>
<tr>
<td>Wynne et al</td>
<td>1996</td>
<td>Alberta</td>
<td>SOGS ⁹</td>
<td>972</td>
<td></td>
<td>8.5%</td>
</tr>
<tr>
<td>Becona</td>
<td>1997</td>
<td>Galicia</td>
<td>DSM-IV-J ⁹</td>
<td>1,200</td>
<td>11-16</td>
<td>2.2%</td>
</tr>
<tr>
<td>Becona</td>
<td>1997</td>
<td>Asturias</td>
<td>DSM-IV-J ⁹</td>
<td>2,185</td>
<td>11-16</td>
<td>1.6%</td>
</tr>
<tr>
<td>Steinberg</td>
<td>1997</td>
<td>Connecticut</td>
<td>SOGS-RA ⁹</td>
<td>3,886</td>
<td></td>
<td>8.7%</td>
</tr>
<tr>
<td>Gupta &amp; Derevensky</td>
<td>1998</td>
<td>Montreal</td>
<td>DSM-IV-J ⁹</td>
<td>817</td>
<td>12-17</td>
<td>4.7%</td>
</tr>
<tr>
<td>Wood &amp; Griffiths</td>
<td>1998</td>
<td>England</td>
<td>DSM-IV-J ⁹</td>
<td>1,195</td>
<td>11-16</td>
<td>6%</td>
</tr>
<tr>
<td>Volberg</td>
<td>1998</td>
<td>New York</td>
<td>SOGS-RA ⁹ ¹¹</td>
<td>1,103</td>
<td>13-17</td>
<td>2.4% 1.09% + 14% at risk</td>
</tr>
<tr>
<td>Fisher</td>
<td>2000</td>
<td>England &amp; Wales</td>
<td>DSM-IV-MR-J ⁹</td>
<td>9,774</td>
<td>12-15</td>
<td>5.6% 0.4%</td>
</tr>
<tr>
<td>Lesieur &amp; Klein</td>
<td>1984</td>
<td>NJ</td>
<td></td>
<td></td>
<td></td>
<td>5% + 5% at risk</td>
</tr>
<tr>
<td>Jacobs et al.</td>
<td>1985</td>
<td>CA - west</td>
<td>GA20</td>
<td>843</td>
<td>opportunistic</td>
<td>4% + 5% at risk</td>
</tr>
<tr>
<td>Jacobs et al</td>
<td>1987</td>
<td>CA</td>
<td>GA20</td>
<td>257</td>
<td>opportunistic</td>
<td>4% + 5% at risk</td>
</tr>
<tr>
<td>Steinberg</td>
<td>1988</td>
<td>CT - east</td>
<td>DSM-III</td>
<td>573</td>
<td>opportunistic</td>
<td>5% +1.5% at risk</td>
</tr>
<tr>
<td>LADOUCEUR &amp; Mireault</td>
<td>1988</td>
<td>Northern US</td>
<td>Pathological Gambling Signs Index</td>
<td>1612</td>
<td>random</td>
<td>3.6%</td>
</tr>
<tr>
<td>Winters et al</td>
<td>1990</td>
<td>MN</td>
<td></td>
<td></td>
<td></td>
<td>6% + 20% at risk</td>
</tr>
<tr>
<td>Wallisch</td>
<td>1993</td>
<td>TX - south</td>
<td>Multifactor Method</td>
<td>924</td>
<td>random</td>
<td>5%+11.7% at risk</td>
</tr>
<tr>
<td>Volberg</td>
<td>1993</td>
<td>WA - west</td>
<td>Multifactor Method</td>
<td>1054</td>
<td>random</td>
<td>0.9% + 9% at risk</td>
</tr>
<tr>
<td>Winters &amp; Sintchfield¹</td>
<td>1993</td>
<td>Midcentral</td>
<td>SOGS-RA</td>
<td>532</td>
<td>random</td>
<td>2.9% potential path; 11.7% potential high-risk</td>
</tr>
<tr>
<td>Study</td>
<td>Year</td>
<td>Location</td>
<td>Methodology</td>
<td>Sample Size</td>
<td>Problem Pathology</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------</td>
<td>-------------------</td>
<td>------------------------------------</td>
<td>-------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>Winters &amp; Stinchfield ¹</td>
<td>1993</td>
<td>Midcentral</td>
<td>SOGS-RA</td>
<td>532 random</td>
<td>3.5% potential path; 9.3% potential high-risk</td>
<td></td>
</tr>
<tr>
<td>Winters et al.,</td>
<td>1993a</td>
<td>Midcentral</td>
<td>SOGS-RA</td>
<td>1101 random/opportunistic</td>
<td>8.3% problem</td>
<td></td>
</tr>
<tr>
<td>Winters et al.,</td>
<td>1993b</td>
<td>Midcentral</td>
<td>SOGS-RA</td>
<td>702 random</td>
<td>8.7% problem; 17.1% at risk</td>
<td></td>
</tr>
<tr>
<td>Shaffer et al</td>
<td>1994</td>
<td>MA – East</td>
<td>MAGS</td>
<td>856 representative</td>
<td>8.5% + 13.9% at risk</td>
<td></td>
</tr>
<tr>
<td>Wallisch</td>
<td>1995</td>
<td>TX</td>
<td></td>
<td></td>
<td>2% + 10% at risk</td>
<td></td>
</tr>
<tr>
<td>Volberg</td>
<td>1996</td>
<td>GA</td>
<td></td>
<td></td>
<td>2% + 9% at risk</td>
<td></td>
</tr>
<tr>
<td>Westphal et al</td>
<td>1998</td>
<td>WA</td>
<td></td>
<td></td>
<td>6% + 10% at risk</td>
<td></td>
</tr>
<tr>
<td>Ladouceur &amp; Mireault</td>
<td>1988</td>
<td>Quebec</td>
<td></td>
<td></td>
<td>2%+5% at risk</td>
<td></td>
</tr>
<tr>
<td>Omnifacts Research, Ltd</td>
<td>1993</td>
<td>Nova Scotia</td>
<td></td>
<td></td>
<td>3% and 9% at risk</td>
<td></td>
</tr>
<tr>
<td>Insight Research Canada</td>
<td>1994</td>
<td>Ontario</td>
<td></td>
<td></td>
<td>4% and 10% at risk</td>
<td></td>
</tr>
<tr>
<td>Rupchich et al</td>
<td>1995</td>
<td>Windsor, Ontario</td>
<td></td>
<td></td>
<td>11% + 17% at risk</td>
<td></td>
</tr>
<tr>
<td>Gupta &amp; Derevensky</td>
<td>1998</td>
<td>Quebec</td>
<td></td>
<td></td>
<td>8% + 8% at risk</td>
<td></td>
</tr>
<tr>
<td>National Opinion Research Center (NORC)</td>
<td>1999</td>
<td>Chicago; but national sample</td>
<td>DSM-IV Problem 3-4; pathological 5.</td>
<td>534; 67% had gambled</td>
<td>16-17</td>
<td>1.5% problem/pathological (3+ on DSM-IV)</td>
</tr>
<tr>
<td>Carlson &amp; Moore</td>
<td>1998</td>
<td>Oregon</td>
<td>Telephone survey; instrument not specified</td>
<td>1000; 66% had gambled for money in past year</td>
<td>13-17</td>
<td>Problem gamblers 4.1%</td>
</tr>
<tr>
<td>Westphal et al</td>
<td>2000</td>
<td>Louisiana</td>
<td>Not specified</td>
<td>12,066 high school students</td>
<td>Grades 6-12</td>
<td>86% had ever gambled; problem gamblers 6%</td>
</tr>
<tr>
<td>Proimos et al</td>
<td>1998</td>
<td>Vermont, 1995</td>
<td>Instrument not specified/or not used.</td>
<td>16,948</td>
<td>Grade 8-12</td>
<td>53% gambled in past 12 months; 7% reported gambling caused problems</td>
</tr>
<tr>
<td>Study</td>
<td>Year</td>
<td>Location</td>
<td>Sample Size</td>
<td>Age Group</td>
<td>Notes</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>------</td>
<td>--------------</td>
<td>-------------</td>
<td>-----------</td>
<td>----------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Volberg</td>
<td>1998</td>
<td>New York</td>
<td>Not specified</td>
<td>1,103</td>
<td>Aged 13-17 75% had gambled in past year. 2.4% problem gamblers</td>
<td></td>
</tr>
<tr>
<td>Stinchfield</td>
<td>2000</td>
<td>Minnesota</td>
<td>Not specified</td>
<td>78,582</td>
<td>9-12th grade Not specified</td>
<td></td>
</tr>
<tr>
<td>Winters, Stinchfield &amp; Kim</td>
<td>1995</td>
<td></td>
<td>Longitudinal, telephone survey in 1990. Instrument not specified</td>
<td>T1:702; 1 year later T2: 532. 76% response rate</td>
<td>Not specified. Rates of problem and pathological gambling did not change over time</td>
<td></td>
</tr>
<tr>
<td>Volberg &amp; Moore</td>
<td>1999</td>
<td>Washington</td>
<td>Instrument not specified</td>
<td>Two random telephone samples. N=1045 in 1993; n=1000 in 1999</td>
<td>13-17 Increase in non-gamblers from 16.7% to 22.4%. Prevalence rate remained stable at 1%</td>
<td></td>
</tr>
<tr>
<td>Stinchfield</td>
<td>2001</td>
<td>Minnesota</td>
<td>Instrument not specified</td>
<td>3 waves. N=75,806 in 1992; n=73,897 in 1995; n=78,582 in 1998</td>
<td>9th &amp; 12th grade students Fewer students gambling in 1998 than in 1995. A small but growing number of 12th grade students who gambled frequently</td>
<td></td>
</tr>
</tbody>
</table>

1. This study reported an original and follow-up prevalence estimate.
2. Timeframe = lifetime
3. Timeframe = past year
4. Multi-factorial definitions – see individual studies for details
5. The MAGS is based on DSM-IV
Appendix 4

Items comprising the Victorian Gambling Screen
The Victorian Gambling Screen

Please answer using the scale: *(Readout)* "Never, rarely, sometimes, often, always". "Your answers will be for the last 12 months." "So in the last 12 months..." **Interviewer note:** DO NOT PROMPT FOR CAN'T SAY OR NOT APPLICABLE. For all scale questions, if respondent answers no code as never = 0.

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Some-</th>
<th>Often</th>
<th>Always</th>
<th>Can't</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Q1 Has gambling been a good hobby for you? Nowadays, when you gamble, is it fun?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Q2 Have you gambled with skill? Nowadays, when you gamble, do you feel as if you are on a slippery slope and can't get back up again?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Q5 Has your need to gamble been too strong to control? Has gambling been more important than anything else you might do? Have you felt that after losing you must return as soon as possible to win back any losses? Has the thought of gambling been constantly in your mind Have you lied to yourself about your gambling? Have you gambled in order to escape from worry or trouble? Have you felt bad or guilty about your gambling? Have you thought you shouldn't gamble or should gamble less? How often has anyone close to you complained about your gambling? How often have you lied to others to conceal the extent of your involvement in gambling? How often have you hidden betting slips, Lotto tickets, gambling money or other signs of gambling from your spouse, partner, children or other important people in your life?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
### Again thinking of the past 12 months

(Read out questions)
Record response as Yes or No.
For YES response ask second question Q(b).
Otherwise continue to next Q (a).
These questions are only applicable if respondent has a partner.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q16a</td>
<td>1</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Q16b</td>
<td>Yes 1</td>
<td>Partly 2</td>
<td>No 3</td>
</tr>
<tr>
<td>Q17a</td>
<td>1</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Q17b</td>
<td>Yes 1</td>
<td>Partly 2</td>
<td>No 3</td>
</tr>
<tr>
<td>Q18a</td>
<td>1</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Q18b</td>
<td>Yes 1</td>
<td>Partly 2</td>
<td>No 3</td>
</tr>
</tbody>
</table>

Please use the scale as before to answer the next questions.
"Never, rarely, sometimes, often, always":

In the past 12 months

<table>
<thead>
<tr>
<th>Question</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
<th>Can't Say</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q19</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Q20</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Q21</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>
Appendix 5

Harm to Self Scale
(Ben-Tovim et al., 2001)
1. Nowadays, when you gamble, do you feel as if you are on a slippery slope and can’t get back up again?

2. Has your need to gamble been too strong to control?

3. Has gambling been more important than anything else you might do?

4. Have you felt that after losing you must return as soon as possible to win back any losses?

5. Has the thought of gambling been constantly in your mind

6. Have you lied to yourself about your gambling?

7. Have you gambled in order to escape from worry or trouble?

8. Have you felt bad or guilty about your gambling?

9. Have you thought you shouldn’t gamble or should gamble less?

10. How often has anyone close to you complained about your gambling?

11. How often have you lied to others to conceal the extent of your involvement in gambling?

12. How often have you hidden betting slips, Lotto tickets, gambling money or other signs of gambling from your spouse, partner, children or other important people in your life?

13. How often have you spent more money on gambling than you can afford

14. How often has your gambling made it harder to make money last from one payday to the next

15. How often have you had to borrow money to gamble with?

Harm to Self Scale reproduced from VGS Interim Manual (Ben-Tovim, 2001; p. 155).
Appendix 6

Factors Comprising the SEM model testing
Jacobs General Theory of Addiction (Gupta & Derevensky, 1998)

Physiological disposition

Excitability (HSPQ) Arousal (Cattell, Catell, & Johns, 1984)

A self-report character trait inventory used to diagnose behaviour problems during adolescence. The 14 traits are warmth, intelligence, emotional stability, excitability, dominance, conformity, boldness, sensitivity, withdrawal, enthusiasm, apprehension, self-sufficiency, self-discipline and tension. Reliability for the HSPQ is .83 and requires approximately 45 minutes to complete.

Emotional predisposition

Self-concept (Harter) RADS (Reynolds, 1987)

Measure of depression amongst adolescents consisting of 30 items on a four point likert-type scale. Reliability for the scale ranges from .91 to .94.

Need to escape

Dissociation (Jacobs, 1988)

Items included ‘feeling like in a trance, feeling like a different person, lose track of time; experience blackouts, feel outside of self’ (see also Gupta & Derevensky, 1998; pp. 32.)

Comorbidity

Drug use items

Twenty questions relating to frequency of drug and alcohol use (detailed in Gupta & Derevensky, 1998: pp. 34)

Gambling Severity

DSM-IV-J (Fisher, 1992)

Twelve item instrument designed as a screen for Pathological Gambling during adolescence, and modelled after the DSM-IV (APA, 1994) adult criteria.
Appendix 7

Study 1 Interview Questions
1. Can you tell me about your life? What it’s like, the good things and the bad things? Once we start I’d prefer not to interrupt you. Do you have any questions before we start?

Only allowable prompt: “Can you tell me more?”

2. Are any of the good or bad things because of gambling?

3. Does gambling jeopardise your goal(s) in any way?

4. If you want to win at gambling what is the best thing you could do?
   - How could you go about it?

5. Have you ever had a big win/loss
   - How? When?

6. Can you think about the last time you spent a ‘lot’ of money gambling.
   - Did you know beforehand that you would?
   - Was there anything that made you decide to splurge?

7. When you have been gambling, how do you stop?

8. Do you ever feel any conflict about gambling – like one part of you says yes and another part says no?

9. Is there anything we haven’t asked you about gambling that you would like to say or you think is important?
Appendix 8

Study 1 Sample Demographics
<table>
<thead>
<tr>
<th>Age</th>
<th>No</th>
<th>%</th>
<th>Status</th>
<th>No</th>
<th>%</th>
<th>Education</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>2</td>
<td>5.9</td>
<td>Single</td>
<td>19</td>
<td>55.9</td>
<td>Year 7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>2.9</td>
<td>Separated</td>
<td>2</td>
<td>5.9</td>
<td>Year 8</td>
<td>2</td>
<td>5.9</td>
</tr>
<tr>
<td>18</td>
<td>4</td>
<td>11.8</td>
<td>Partnered</td>
<td>13</td>
<td>38.2</td>
<td>Year 9</td>
<td>1</td>
<td>2.9</td>
</tr>
<tr>
<td>19</td>
<td>3</td>
<td>8.8</td>
<td></td>
<td>1</td>
<td>2.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>5</td>
<td>14.7</td>
<td></td>
<td>1</td>
<td>2.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>8</td>
<td>23.5</td>
<td></td>
<td>11</td>
<td>32.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>4</td>
<td>11.8</td>
<td>Sex No</td>
<td>11</td>
<td>32.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>3</td>
<td>8.8</td>
<td>Male</td>
<td>2</td>
<td>5.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>4</td>
<td>11.8</td>
<td>Female</td>
<td>10</td>
<td>29.4</td>
<td>Graduate</td>
<td>7</td>
<td>20.6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student</th>
<th>Occupation</th>
<th>Suburb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Semi-skilled</td>
<td>Beverley Hills</td>
</tr>
<tr>
<td>No</td>
<td>Trade</td>
<td>Blacktown</td>
</tr>
<tr>
<td>Employment</td>
<td>Sales/clerical</td>
<td>Bondi</td>
</tr>
<tr>
<td>Unemployed</td>
<td>Manager</td>
<td>Box Hill</td>
</tr>
<tr>
<td>Part-time</td>
<td>Self-employed</td>
<td>Dee Why</td>
</tr>
<tr>
<td>Full-time</td>
<td>Professional</td>
<td>Fairy Meadow</td>
</tr>
<tr>
<td>*Student</td>
<td>Unemployed</td>
<td>Guildford</td>
</tr>
<tr>
<td>Income</td>
<td>2nd Language</td>
<td>Suburb</td>
</tr>
<tr>
<td>&lt;$116</td>
<td>5</td>
<td>14.7</td>
</tr>
<tr>
<td>$116-$192</td>
<td>6</td>
<td>17.6</td>
</tr>
<tr>
<td>$193-$288</td>
<td>5</td>
<td>14.7</td>
</tr>
<tr>
<td>$289-$384</td>
<td>3</td>
<td>8.8</td>
</tr>
<tr>
<td>$385-$481</td>
<td>3</td>
<td>8.8</td>
</tr>
<tr>
<td>$462-$577</td>
<td>5</td>
<td>14.7</td>
</tr>
<tr>
<td>$578-$673</td>
<td>2</td>
<td>5.9</td>
</tr>
<tr>
<td>$674-$769</td>
<td>2</td>
<td>5.9</td>
</tr>
<tr>
<td>$769-$864</td>
<td>1</td>
<td>2.9</td>
</tr>
<tr>
<td>$865-$961</td>
<td>1</td>
<td>2.9</td>
</tr>
<tr>
<td>&gt;$961</td>
<td>1</td>
<td>2.9</td>
</tr>
</tbody>
</table>

**Living Situation**

- Home: 21 61.8
- Relatives: 2 5.9
- Partner: 2 5.9
- Share house: 7 20.6
- Alone: 2 5.9

*Just 1 student does not have employment at all.

**1 person speaks 2 second languages (Arabic and Spanish)
Appendix 9

Study 2 - CASPM

Example Scored Interview Transcripts
Aaron (268 words)

I get up, / I do a five day week,"4/ I leave home at five thirty in the morning / and I get home at about six thirty at night."2/ Five days a week./ A few of those days I see my girlfriend at night."5/ A few of those days I might go to the club/ or the TAB or something./ Saturdays I usually always at the TAB/ or the club./ Saturday nights go out with my girlfriend"5/ and sometimes with some friends/ and basically just live./ That's about all I can say./ Go out to dinner a bit/ and stuff like that./ I've got a little bit of a social life still."5/ So that's about a week for me./ Good things,good things, let me see./ My girlfriend,/ I am employed"4/ so I have got to be happy about that./ I am earning decent money,"4/ I mean I don't really call it decent/ but other people call it decent./ To me it is nothing,/ I don't think it is good money/ but from the average people in this world they think it is good money./ Other good things basically when I go out with my girlfriend"5/ and drink/ and go out with friends"5/ and that's about it really./ I don't do any sports or nothing./ That would be about it./ Bad things is when I lose money"2/ and have to borrow it"2/ and get into debt."2/ When I fight with my girlfriend./ Lending money and trying to get it back."2/ That's about it, nothing else really bad./ Oh the hours I work are pretty bad that's about it."2/
Julie  (222 words)

I am currently working for the Department of Community Services\(^4\) and it finishes for me on the 14th of February./ Which is a good thing/ because after that/ on the 22nd of February/ I go back to being a full time student\(^4\)/ which is a good thing,/ I am pretty excited about that./ The job I have now/ although it is okay,/ it is not necessarily a good thing./ I have been doing that since September 97./ Before that I lived in Sydney for a year./ And worked up there and that was definitely a bad thing/ so I am very happy to be back down here/ although it has been quite some time now./ I have just moved house and that is a good thing.\(^3\)/ So I don't know.\(^3\)/ Is that enough?/ Something that is important to me/, in March next year, March 99/ I will not only be back in uni doing what I want to do/ but getting to direct a way is really cool too.\(^4\)/ Well it is really important as well as being really cool/ because it is like somebody has given us money to do something really\(^4\)/ even though it is neither of our chosen careers,/ someone is actually giving us money to do something that we really love\(^4\)/ and that is cool./ It is exciting./
Appendix 10

CASPM Examples of Scorable Phrases
(Viney, Rudd, Grenyer and Tych, 1995)
Affinity
It is good to have people who care about you the way you care about them;
We have a lot of fun together;
I feel very in tune with God.

Isolation
I never really feel part of that group;
I am alone for much of the time;
That relationship never developed.

Industry
I thought about the problem for quite a while before I did anything;
I've made a good job of that garden;
I love my work; I get a real sense of satisfaction out of painting.

Inferiority
I should have realised that we would need wet weather footwear here;
I am never going to succeed;
I've still got more work to do, I'm sorry to say.

Initiative
I usually get myself going pretty quickly;
I left home at 15 and earned my own wage ever since;
I enjoy a challenge.

Hesitancy
I'm not a self-starter;
I'm not sure what to say/do;
I need to have people around me.

Autonomy
It's good to be able to do what I want to do with my time;
I can cope on my own;
I was able to keep my temper, I was pleased about that.

Constraint
The decision has been taken out of my hands;
I have to do what I am told;
There are lots of restrictions when you are locked up.

Trust
Things will work out all right;
I've got understanding parents;
It was a great help to have my mother here when the baby was born.

Mistrust
I don't expect much from life;
The doctors don't know what they are doing;
I can't bear being fussed over.

Reproduced from Viney, Rudd, Grenyer and Tych (1995)
Appendix 11

Summary of Formative Research in the Development of the TRI
<table>
<thead>
<tr>
<th>Sample</th>
<th>220 single white college students, participated for course credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method</td>
<td>Surveys for daily drinking rates; Negative consequences of alcohol use; Drinking Restraint Scale (23 items)</td>
</tr>
<tr>
<td>Analysis</td>
<td>Cluster Analysis; Multiple Regression</td>
</tr>
<tr>
<td>Dependent Variable</td>
<td>Actual alcohol consumption per occasion</td>
</tr>
</tbody>
</table>

Collins, George & Lapp, 1989

<table>
<thead>
<tr>
<th>Sample</th>
<th>323 social drinkers; 197 men, 126 women. Mean age of 26.8 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method</td>
<td>Surveys for RDS; Drinking Attributional Style Questionnaire (DASQ); Assessment of Alcohol consumption – using the Daily Drinking questionnaire; Short Michigan Alcoholism Screening Test (SMAST); Beck Depression Inventory. $15 incentive.</td>
</tr>
<tr>
<td>Analysis</td>
<td>Cross Sectional; Multivariate Multiple Regression</td>
</tr>
<tr>
<td>Dependent Variable</td>
<td>3 aspects of self-reported drinking: minimum drinks per occasion, maximum drinks per occasion and drinking related problems</td>
</tr>
</tbody>
</table>

Collins & Lapp, 1991

| Results | Cluster analysis revealed 4 components to DRS: Consume, Govern, Emotion, Restrict. Consume was confounded with DV measure of actual consumption and removed. Remaining 18 item RDS scale was insignificant and accounted for only 2% of variance. Restrict and Govern were most relevant to RDS concept and did predict consumption. |

<p>| Results | Aim was to test for the AVE. Measure of perceived efficacy (Govern) was the strongest and the single most pervasive predictor of all three measures of alcohol consumption. Restrict did not predict alcohol-related problems, possibly suggesting that individuals reporting such problems are no longer attempting to or are not effectively setting limits on their drinking. Provided support for the existence of an alcohol-related AVE for social drinkers. |</p>
<table>
<thead>
<tr>
<th>Collins &amp; Lapp, 1992</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample</strong></td>
<td>197 men and 126 women, community members paid $15 for participation</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>Create a new measure of drinking restrain, building on and retesting the 3 DRS factors, combining them with measures aimed specifically at tapping cognitive preoccupation with limiting drinking.</td>
</tr>
<tr>
<td><strong>Analysis</strong></td>
<td>Factor analysis, Multiple Regression LISREL.</td>
</tr>
<tr>
<td><strong>Dependent Variable</strong></td>
<td>Weekly alcohol consumption scores (min max) and SMAST (alcohol problems).</td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td>Both TRI and their interaction terms predicted additional 36% of variance in weekly alcohol consumption. CEP factor predicted higher levels of weekly alcohol consumption and the CBC factor predicted slightly lower levels of weekly alcohol consumption. TRI results reminiscent of cycle of successful (CBC Factor) and unsuccessful (CEP factor) regulation inherent in the Restraint construct. Therefore measures the multifaceted construct of drinking Restraint in a manner that quantifies an individual’s propensity to resist or engage in drinking.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Collins, Gollnisch, Izzo, 1995</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample</strong></td>
<td>132 male social drinkers</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>Experimental study</td>
</tr>
<tr>
<td><strong>Analysis</strong></td>
<td>Regression Analysis</td>
</tr>
<tr>
<td><strong>Dependent Variable</strong></td>
<td>Two aspects of drinking Restraint, self-monitoring and their interactions</td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td>The score for each higher order factor of the TRI is derived by adding the ratings of all of the items contained in its constituent factors. The CEP factor is positively related and the CBC is negatively related, to typical levels of alcohol consumption. The results are consistent with previous research characterizing temptation as a risk factor for increased consumption.</td>
</tr>
<tr>
<td>Connors, Collins, Dermen &amp; Koutsky, 1998</td>
<td>Results</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Sample</strong> 193 clients of a treatment program for alcohol and other drug abuse. Mean age of 33.4. 77% of sample met DSM-III-R criteria for alcohol dependence (clinical sample)</td>
<td>The TRI was modified to the D-TRI for use with substance abuse. All subjects described alcohol as their primary drug. The two factor structure of CEP and CBC were confirmed. Frequency of use and consequences of drug use were predicted by the CEP and CBC factors, providing further support for a multifactorial characterization of Restraint. TRI scores were more powerful predictors of the drinking variables than the D-TRI was in predicting drug variables. Suggested Restraint may be less pertinent in a clinical population. Gender was not a significant predictor of either alcohol or drug use frequency.</td>
</tr>
<tr>
<td><strong>Method</strong> D-TRI (modified version of TRI for drug use). 2 other alcohol and 2 other drug use instruments</td>
<td></td>
</tr>
<tr>
<td><strong>Analysis</strong> Confirmatory factor analysis to the two factor structure – used EQS equivalent to LISREL. Series of hierarchical linear regression analyses to test predictions. Always fit interaction terms as well. Control for gender-entered first</td>
<td></td>
</tr>
<tr>
<td><strong>Dependent Variable</strong> Measures of alcohol use and consequences</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Collins and Koutsky, 2000</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample</strong> Community sample of 296 adults aged 21-55 years (mean 31.35 years) who self-reported moderate to heavy drinking. Recruited via newspaper advertisements. Incentive of $15 for participation</td>
<td>Test of the utility of the TRI and related measures to predict alcohol problems. Gender was entered at step 1 and typical drinking at step 2; 3 measures of drinking were entered at step 3 and the TRI at Step 4. In this stepwise regression the TRI accounted for an additional 22% of variance (fitted last) with the CEP factor being a significant (Beta -0.52, p&lt;.001) predictor.</td>
</tr>
<tr>
<td><strong>Method/Analysis</strong> Predictive utility tested using hierarchical multiple regression equations. Separate contributions made by the two higher order factors of the TRI was tested related measures of alcohol use.</td>
<td></td>
</tr>
<tr>
<td><strong>Dependent Variable</strong> Short Michigan alcoholism Screening Test (SMAST) consisting of 13 items concerning problems related to alcohol use.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 12

The Gambling
Temptation and Restraint Inventory
<table>
<thead>
<tr>
<th>Govern</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Do you find that once you start gambling it is difficult for you to stop?</td>
</tr>
<tr>
<td>13. Do you have difficulty controlling your gambling?</td>
</tr>
<tr>
<td>15. Do you find it takes considerable effort to keep your gambling under control?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emote</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When you feel unhappy or anxious are you more likely to gamble?</td>
</tr>
<tr>
<td>2. When you feel lonely are you more likely to gamble?</td>
</tr>
<tr>
<td>6. Do you ever feel so stressed or nervous that you really need to gamble?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CP</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Do you attempt to cut down the amount of time or money you gamble*</td>
</tr>
<tr>
<td>7. Do thoughts about gambling intrude into your every-day activities?</td>
</tr>
<tr>
<td>11. Is it hard to distract yourself from thinking about gambling?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Restrict</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. How often do you attempt to cut down the amount you gamble?</td>
</tr>
<tr>
<td>10. Do feelings of guilt about gambling too much help you control your gambling?</td>
</tr>
<tr>
<td>14. Do you ever cut back on your gambling in an attempt to change your gambling habits?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Does seeing other people gamble remind you of your efforts to control your own gambling?</td>
</tr>
<tr>
<td>8. Does seeing commercials, magazine ads., and or signs for gambling venues make you think about the need to limit your gambling?</td>
</tr>
<tr>
<td>12. Do the sights and sounds of gambling make you think about limiting your gambling?</td>
</tr>
</tbody>
</table>
Appendix 13

<table>
<thead>
<tr>
<th></th>
<th>NSW Youth 1999</th>
<th>NSW Adult 1997</th>
<th>NSW Adult 1995</th>
<th>Western Sydney 1996</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEX</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Male</td>
<td>48.5</td>
<td>48.4</td>
<td>54.2</td>
<td>51.0</td>
</tr>
<tr>
<td>Female</td>
<td>51.5</td>
<td>51.6</td>
<td>45.8</td>
<td>49.0</td>
</tr>
<tr>
<td>AGE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-17</td>
<td>36.4</td>
<td>0.0</td>
<td>0.0</td>
<td>76.2</td>
</tr>
<tr>
<td>18-24</td>
<td>62.4</td>
<td>100.0</td>
<td>100.0</td>
<td>23.8</td>
</tr>
<tr>
<td>No response</td>
<td>1.2</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>MARITAL STATUS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partnered</td>
<td>37.9</td>
<td>24.2</td>
<td>19.6</td>
<td>N/A</td>
</tr>
<tr>
<td>Single</td>
<td>61.2</td>
<td>75.8</td>
<td>80.4</td>
<td>N/A</td>
</tr>
<tr>
<td>No response</td>
<td>0.9</td>
<td>0.0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>EDUCATIONAL LEVEL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>0.5</td>
<td>0.7</td>
<td>0.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Secondary</td>
<td>57.0</td>
<td>37.3</td>
<td>38.5</td>
<td>82.5</td>
</tr>
<tr>
<td>Tertiary</td>
<td>42.2</td>
<td>61.4</td>
<td>60.3</td>
<td>17.5</td>
</tr>
<tr>
<td>No response</td>
<td>0.3</td>
<td>0.7</td>
<td>0.6</td>
<td>0.0</td>
</tr>
<tr>
<td>WORK STATUS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time worker</td>
<td>28.7</td>
<td>37.3</td>
<td>43.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Part-time worker</td>
<td>41.0</td>
<td>27.5</td>
<td>17.9</td>
<td>95.8</td>
</tr>
<tr>
<td>No employment</td>
<td>17.4</td>
<td>5.9</td>
<td>5.6</td>
<td>4.2</td>
</tr>
<tr>
<td>Other</td>
<td>5.7</td>
<td>28.1</td>
<td>33.5</td>
<td>0.0</td>
</tr>
<tr>
<td>No response</td>
<td>7.2</td>
<td>1.3</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Student</td>
<td>61.9</td>
<td>22.2</td>
<td>2.2</td>
<td>100</td>
</tr>
<tr>
<td>Non-student</td>
<td>38.1</td>
<td>77.8</td>
<td>97.8</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>NSW Youth 1999</td>
<td>NSW Adult 1997</td>
<td>NSW Adult 1995</td>
<td>Western Sydney 1996</td>
</tr>
<tr>
<td>----------------</td>
<td>----------------</td>
<td>----------------</td>
<td>----------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>16-24 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N=1008</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;$10,000</td>
<td>33.2</td>
<td>37.9</td>
<td>18.3</td>
<td>100.0</td>
</tr>
<tr>
<td>$10,001-$19,999</td>
<td>13.1</td>
<td>24.2</td>
<td>29.2</td>
<td>0.0</td>
</tr>
<tr>
<td>$20,00-$29,999</td>
<td>12.3</td>
<td>18.3</td>
<td>26.7</td>
<td>0.0</td>
</tr>
<tr>
<td>$30,000-$39,999</td>
<td>8.6</td>
<td>9.2</td>
<td>16.7</td>
<td>0.0</td>
</tr>
<tr>
<td>$40,000-$49,999</td>
<td>6.8</td>
<td>5.3</td>
<td>2.5</td>
<td>0.0</td>
</tr>
<tr>
<td>$50,000-$59,999</td>
<td>7.3</td>
<td>0.7</td>
<td>1.7</td>
<td>0.0</td>
</tr>
<tr>
<td>&gt;$60,000</td>
<td>11.3</td>
<td>1.3</td>
<td>0.8</td>
<td>0.0</td>
</tr>
<tr>
<td>No response</td>
<td>7.4</td>
<td>3.3</td>
<td>4.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional/Semi Prof</td>
<td>6.9</td>
<td>6.5</td>
<td>3.4</td>
<td>N/A</td>
</tr>
<tr>
<td>Managers/Business</td>
<td>2.7</td>
<td>1.3</td>
<td>34.6</td>
<td>N/A</td>
</tr>
<tr>
<td>Owners</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trades/Skilled &amp; Unskilled</td>
<td>39.4</td>
<td>45.8</td>
<td>2.8</td>
<td>N/A</td>
</tr>
<tr>
<td>Clerical/sales</td>
<td>18.4</td>
<td>30.1</td>
<td>26.3</td>
<td>N/A</td>
</tr>
<tr>
<td>Apprentice</td>
<td>0.6</td>
<td>0.0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>None</td>
<td>22.9</td>
<td>16.3</td>
<td>33.3</td>
<td>N/A</td>
</tr>
<tr>
<td>No response</td>
<td>9.1</td>
<td>0.0</td>
<td>0.0</td>
<td>N/A</td>
</tr>
<tr>
<td>NESB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>20.4</td>
<td>29.4</td>
<td>22.3</td>
<td>23.4</td>
</tr>
<tr>
<td>No</td>
<td>79.6</td>
<td>68.0</td>
<td>77.7</td>
<td>76.6</td>
</tr>
<tr>
<td>No response</td>
<td>0.0</td>
<td>2.6</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Appendix 14

Study 3 – Youth Telephone Questionnaire
NOTE

The following page (s) missing from original.
Appendix 15

Confirmatory Factor Analysis

Table of Non-Normed Fit Indices
<table>
<thead>
<tr>
<th>Model No</th>
<th>Model Name</th>
<th>$X^2$</th>
<th>Df</th>
<th>RMSEA</th>
<th>RMSEA Prob &lt; .05</th>
<th>NNFI</th>
<th>CFI</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>M100</td>
<td>5 factors a priori</td>
<td>39.46</td>
<td>100</td>
<td>0.0</td>
<td>1.00</td>
<td>1.22</td>
<td>1.00</td>
<td>Collaps Restrict and Concern</td>
</tr>
<tr>
<td>M101</td>
<td>4 factors</td>
<td>40.99</td>
<td>106</td>
<td>0.0</td>
<td>1.00</td>
<td>1.22</td>
<td>1.00</td>
<td>Reassign CP4 to Cognitive Control</td>
</tr>
<tr>
<td>M102</td>
<td>4 factors</td>
<td>29.35</td>
<td>106</td>
<td>0.0</td>
<td>1.00</td>
<td>1.26</td>
<td>1.00</td>
<td>Free correlated uniqueness of E6 - CP</td>
</tr>
<tr>
<td>M103</td>
<td>4 factors</td>
<td>24.67</td>
<td>105</td>
<td>0.0</td>
<td>1.00</td>
<td>1.27</td>
<td>1.00</td>
<td>As above</td>
</tr>
<tr>
<td>M103b</td>
<td>Add background variables</td>
<td>31.76</td>
<td>138</td>
<td>0.0</td>
<td>1.00</td>
<td>1.41</td>
<td>1.00</td>
<td>As above</td>
</tr>
</tbody>
</table>
Appendix 16

Regular Players:
Most Commonly Played Form of Gambling
by Key Demographics
<table>
<thead>
<tr>
<th>Form</th>
<th>Age</th>
<th>Sex</th>
<th>Area</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;18</td>
<td>18+</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Lotto/Oz Lotto</td>
<td>8.1</td>
<td>11.9</td>
<td>4.9</td>
<td>20.7</td>
</tr>
<tr>
<td>Instant Lottery</td>
<td>20.2</td>
<td>7.3</td>
<td>6.3</td>
<td>20.7</td>
</tr>
<tr>
<td>Pools/Bingo/Keno</td>
<td>4.1</td>
<td>2.0</td>
<td>2.1</td>
<td>3.7</td>
</tr>
<tr>
<td>Cards</td>
<td>9.5</td>
<td>1.3</td>
<td>6.9</td>
<td>0.0</td>
</tr>
<tr>
<td>Racing*</td>
<td>18.9</td>
<td>11.9</td>
<td>17.4</td>
<td>8.5</td>
</tr>
<tr>
<td>Egms</td>
<td>13.5</td>
<td>59.6</td>
<td>46.5</td>
<td>40.2</td>
</tr>
<tr>
<td>Miniature horse racing</td>
<td>1.4</td>
<td>0.0</td>
<td>0.7</td>
<td>0.0</td>
</tr>
<tr>
<td>Casino table games</td>
<td>14.8</td>
<td>2.0</td>
<td>6.8</td>
<td>4.9</td>
</tr>
<tr>
<td>Sports betting TAB/bookies</td>
<td>5.4</td>
<td>2.6</td>
<td>4.9</td>
<td>1.3</td>
</tr>
<tr>
<td>Sports betting with friends</td>
<td>1.4</td>
<td>0.0</td>
<td>0.7</td>
<td>0.0</td>
</tr>
<tr>
<td>Board Games (mah jong etc)</td>
<td>0.0</td>
<td>0.7</td>
<td>0.7</td>
<td>0.0</td>
</tr>
<tr>
<td>Can’t say</td>
<td>2.7</td>
<td>0.7</td>
<td>2.1</td>
<td>0.0</td>
</tr>
<tr>
<td>Total N</td>
<td>74</td>
<td>152</td>
<td>144</td>
<td>82</td>
</tr>
</tbody>
</table>

*all animal sports via TAB or bookies
Appendix 17

Syntax for the One-factor Congeneric Solutions
OU SC MI AD=OFF
Appendix 18

Syntax for the G-TRI CFA Model 103b
M103B 4 FACTOR MODEL WITH INVOLVE FREQ AGE AREA SEX
DA NI=20 NO=166 MA=KM
LA
I1 I2 I3 I4 I5 I6 I7 I8 I9 I10 I11 I12 I13 I14 I15 FREQ ALLIMPAC AGE
AREA SEX
CM FI=FULL.CM
NO NX=20 NK=9 LX=FU,FI PH=ST TD=SY,FI
SE
9 13 15 1 2 6 7 11 3 4 10 14 5 8 12 16 17 18 19 20
FA LX
3(1 0 0 0 0 0 0 0 0)
3(0 1 0 0 0 0 0 0 0)
2(0 0 1 0 0 0 0 0 0)
7(0 0 0 1 0 0 0 0 0)
1(0 0 0 0 1 0 0 0 0)
1(0 0 0 0 0 1 0 0 0)
1(0 0 0 0 0 0 1 0 0)
1(0 0 0 0 0 0 0 1 0)
1(0 0 0 0 0 0 0 0 1)
FR LX 6 3
FR TD 1 1 TD 2 2 TD 3 3 TD 4 4 TD 5 5 TD 6 6 TD 7 7 TD 8 8 TD 9 9 TD 10
10
FR TD 11 11 TD 12 12 TD 13 13 TD 14 14 TD 15 15 TD 16 16 TD 17 17 TD 18
18 TD 19 19 TD 20 20
FI TD 16 16 TD 17 17 TD 18 18 TD 19 19 TD 20 20
ST 0 TD 16 16 TD 17 17 TD 18 18 TD 19 19 TD 20 20
LK
GOVERN EMOTION CP CBC FREQ ALLIMPAC AGE AREA SEX
path diagram
OU FS SC MI AD=OFF IT=200
Ref: tr2b.ls8

340
Appendix 19

Covariance matrix to be analysed G-TRI CFA Models
## Covariance Matrix

<table>
<thead>
<tr>
<th></th>
<th>I9</th>
<th>I13</th>
<th>I15</th>
<th>I1</th>
<th>I2</th>
<th>I6</th>
</tr>
</thead>
<tbody>
<tr>
<td>I9</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I13</td>
<td>0.41</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I15</td>
<td>0.55</td>
<td>0.51</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I1</td>
<td>0.49</td>
<td>0.36</td>
<td>0.49</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I2</td>
<td>0.49</td>
<td>0.39</td>
<td>0.60</td>
<td>0.61</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>I6</td>
<td>0.49</td>
<td>0.56</td>
<td>0.57</td>
<td>0.51</td>
<td>0.55</td>
<td>1.00</td>
</tr>
<tr>
<td>I7</td>
<td>0.44</td>
<td>0.52</td>
<td>0.45</td>
<td>0.26</td>
<td>0.30</td>
<td>0.61</td>
</tr>
<tr>
<td>I11</td>
<td>0.58</td>
<td>0.46</td>
<td>0.50</td>
<td>0.38</td>
<td>0.45</td>
<td>0.61</td>
</tr>
<tr>
<td>I3</td>
<td>0.41</td>
<td>0.32</td>
<td>0.35</td>
<td>0.31</td>
<td>0.30</td>
<td>0.40</td>
</tr>
<tr>
<td>I4</td>
<td>0.35</td>
<td>0.30</td>
<td>0.38</td>
<td>0.30</td>
<td>0.39</td>
<td>0.26</td>
</tr>
<tr>
<td>I10</td>
<td>0.42</td>
<td>0.29</td>
<td>0.42</td>
<td>0.32</td>
<td>0.34</td>
<td>0.37</td>
</tr>
<tr>
<td>I14</td>
<td>0.23</td>
<td>0.27</td>
<td>0.37</td>
<td>0.20</td>
<td>0.28</td>
<td>0.28</td>
</tr>
<tr>
<td>I5</td>
<td>0.37</td>
<td>0.27</td>
<td>0.35</td>
<td>0.26</td>
<td>0.41</td>
<td>0.31</td>
</tr>
<tr>
<td>I8</td>
<td>0.30</td>
<td>0.24</td>
<td>0.31</td>
<td>0.27</td>
<td>0.29</td>
<td>0.35</td>
</tr>
<tr>
<td>I12</td>
<td>0.29</td>
<td>0.19</td>
<td>0.40</td>
<td>0.24</td>
<td>0.27</td>
<td>0.20</td>
</tr>
<tr>
<td>FREQ</td>
<td>0.25</td>
<td>0.27</td>
<td>0.25</td>
<td>0.14</td>
<td>0.25</td>
<td>0.35</td>
</tr>
<tr>
<td>ALLIMPAC</td>
<td>0.53</td>
<td>0.64</td>
<td>0.63</td>
<td>0.47</td>
<td>0.53</td>
<td>0.59</td>
</tr>
<tr>
<td>AGE</td>
<td>-0.13</td>
<td>-0.04</td>
<td>-0.06</td>
<td>-0.07</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>AREA</td>
<td>0.00</td>
<td>-0.04</td>
<td>-0.05</td>
<td>0.04</td>
<td>0.03</td>
<td>-0.04</td>
</tr>
<tr>
<td>SEX</td>
<td>-0.27</td>
<td>-0.23</td>
<td>-0.34</td>
<td>-0.10</td>
<td>-0.22</td>
<td>-0.23</td>
</tr>
</tbody>
</table>

## Covariance Matrix

<table>
<thead>
<tr>
<th></th>
<th>I7</th>
<th>I11</th>
<th>I3</th>
<th>I4</th>
<th>I10</th>
<th>I14</th>
</tr>
</thead>
<tbody>
<tr>
<td>I7</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I11</td>
<td>0.53</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I3</td>
<td>0.38</td>
<td>0.36</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I4</td>
<td>0.23</td>
<td>0.27</td>
<td>0.39</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I10</td>
<td>0.29</td>
<td>0.26</td>
<td>0.51</td>
<td>0.44</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>I14</td>
<td>0.28</td>
<td>0.21</td>
<td>0.35</td>
<td>0.45</td>
<td>0.35</td>
<td>1.00</td>
</tr>
<tr>
<td>I5</td>
<td>0.21</td>
<td>0.27</td>
<td>0.27</td>
<td>0.34</td>
<td>0.42</td>
<td>0.29</td>
</tr>
<tr>
<td>I8</td>
<td>0.38</td>
<td>0.28</td>
<td>0.41</td>
<td>0.27</td>
<td>0.43</td>
<td>0.34</td>
</tr>
<tr>
<td>I12</td>
<td>0.11</td>
<td>0.19</td>
<td>0.47</td>
<td>0.45</td>
<td>0.57</td>
<td>0.36</td>
</tr>
<tr>
<td>FREQ</td>
<td>0.29</td>
<td>0.36</td>
<td>0.14</td>
<td>0.22</td>
<td>0.09</td>
<td>0.12</td>
</tr>
<tr>
<td>ALLIMPAC</td>
<td>0.58</td>
<td>0.56</td>
<td>0.52</td>
<td>0.36</td>
<td>0.47</td>
<td>0.31</td>
</tr>
<tr>
<td>AGE</td>
<td>0.05</td>
<td>-0.01</td>
<td>0.03</td>
<td>-0.01</td>
<td>0.09</td>
<td>0.06</td>
</tr>
<tr>
<td>AREA</td>
<td>-0.04</td>
<td>0.00</td>
<td>-0.02</td>
<td>-0.04</td>
<td>-0.08</td>
<td>-0.07</td>
</tr>
<tr>
<td>SEX</td>
<td>-0.35</td>
<td>-0.27</td>
<td>-0.24</td>
<td>-0.20</td>
<td>-0.24</td>
<td>-0.19</td>
</tr>
</tbody>
</table>

342
Covariance Matrix

<table>
<thead>
<tr>
<th></th>
<th>I5</th>
<th>I8</th>
<th>I12</th>
<th>FREQ</th>
<th>ALLIMPAC</th>
<th>AGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I5</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I8</td>
<td>0.29</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I12</td>
<td>0.30</td>
<td>0.37</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FREQ</td>
<td>0.05</td>
<td>0.09</td>
<td>0.21</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALLIMPAC</td>
<td>0.44</td>
<td>0.36</td>
<td>0.31</td>
<td>0.27</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>0.09</td>
<td>0.03</td>
<td>0.02</td>
<td>0.00</td>
<td>-0.02</td>
<td>1.00</td>
</tr>
<tr>
<td>AREA</td>
<td>-0.02</td>
<td>-0.06</td>
<td>0.02</td>
<td>0.07</td>
<td>0.01</td>
<td>-0.04</td>
</tr>
<tr>
<td>SEX</td>
<td>-0.22</td>
<td>-0.15</td>
<td>-0.16</td>
<td>-0.12</td>
<td>-0.33</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Covariance Matrix

<table>
<thead>
<tr>
<th></th>
<th>AREA</th>
<th>SEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>AREA</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>SEX</td>
<td>0.07</td>
<td>1.00</td>
</tr>
</tbody>
</table>
Appendix 20

Multiple Regression Output (SPSS)
<table>
<thead>
<tr>
<th>Coefficients³</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
</tr>
<tr>
<td>1 (Constant)</td>
</tr>
<tr>
<td>D. SEX</td>
</tr>
<tr>
<td>CBC</td>
</tr>
<tr>
<td>CEP</td>
</tr>
<tr>
<td>CEPXCBC</td>
</tr>
</tbody>
</table>

³. Dependent Variable: Sum of Harm Items

<table>
<thead>
<tr>
<th>Coefficients³</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
</tr>
<tr>
<td>1 (Constant)</td>
</tr>
<tr>
<td>D. SEX</td>
</tr>
<tr>
<td>CBC</td>
</tr>
<tr>
<td>CEP</td>
</tr>
<tr>
<td>CEPXCBC</td>
</tr>
</tbody>
</table>

³. Dependent Variable: Q4. FREQUENCY OF GAMBLING

345