

**Substance-related expectancies among men who have sex with men:**

**Development of psychometric tools  
to predict unprotected sexual activity**

by

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**Keywords**

Alcohol, amyl nitrite, cannabis, stimulants, reinforcement from substance use, substance use expectancies, gay/bisexual, MSM, mixed-methods, consensual qualitative analysis, online questionnaire, factor analysis, discriminant function analysis.

**Dedication**

To Sophie and Timothy  
for making it all worthwhile

### Abstract

Significant research has demonstrated direct and indirect associations between substance use and sexual behaviour. Substance use is related to sexual risk-taking and HIV seroconversion among *some* substance-using MSM. It remains unclear what factors mediate or underlie this relationship, and *which* substances are associated with greater harm. Substance-related expectancies are hypothesised as potential mechanisms.

A conceptual model based on social-cognitive theory was tested, which explores the role of demographic factors, substance use, substance-related expectancies and novelty-seeking personality characteristics in predicting unprotected anal intercourse (UAI) while under the influence, across four commonly used substance types.

Phase 1, a qualitative study (N = 20), explored how MSM perceive the effects of substance use on their thoughts, feelings and behaviours, including sexual behaviours. Information was attained through discussion and interviews, resulting in the establishment of key themes. Results indicated MSM experience a wide range of reinforcing aspects associated with substance use. General and specific effects were evident across substance types, and were associated with sexual behaviour and sexual risk-taking.

Phase 2 consisted of developing a comprehensive profile of substance-related expectancies for MSM (SEP-MSM) regarding alcohol, cannabis, amyl nitrite and stimulants that possessed sound psychometric properties and was appropriate for use among this group. A cross-sectional questionnaire with 249 participants recruited through gay community networks was used to validate these measures, and involved online data collection, participants rating expectancy items and subsequent factor analysis. Results indicated expectancies can be reliably assessed, and predicted substance use patterns.

Phase 3 examined demographic factors, substance use, substance-related expectancies, and novelty-seeking traits among another community sample of MSM (N = 277) throughout Australia, in predicting UAI while under the influence. Using a cross-sectional design, participants were recruited through gay community networks and completed online questionnaires. The SEP-MSM, and associated substance use, predicted UAI.

This research extends social-cognitive theory regarding sexual behaviour, and advances understanding of the role of expectancies associated with substance use and sexual risk-taking. Future applications of the SEP-MSM in health promotion, prevention, clinical interventions and research are likely to contribute to reducing harm associated with substance-using MSM (e.g., HIV transmission).

## Table of Contents

<b>Keywords .....</b>	<b>i</b>
<b>Dedication .....</b>	<b>ii</b>
<b>Abstract.....</b>	<b>iii</b>
<b>Table of Contents .....</b>	<b>v</b>
<b>List of Tables .....</b>	<b>xi</b>
<b>List of Figures.....</b>	<b>xiii</b>
<b>List of Abbreviations .....</b>	<b>xiv</b>
<b>Statement of Original Authorship .....</b>	<b>xv</b>
<b>Acknowledgements.....</b>	<b>xix</b>
<b>Chapter 1: Introduction .....</b>	<b>1</b>
<b>Brief Overview of the Research.....</b>	<b>1</b>
<b>HIV among MSM .....</b>	<b>1</b>
<b>Substance Use among MSM .....</b>	<b>2</b>
<b>Substance Use and Sexual Risk Behaviour among MSM.....</b>	<b>4</b>
<b>Expectancy Theory: Exploring the Relationships between Substance         Use and Sexual Risk-taking.....</b>	<b>5</b>
<b>Aims of the Research .....</b>	<b>7</b>
<b>Research Plan.....</b>	<b>8</b>
<b>Significance of the Research .....</b>	<b>9</b>
<b>Structure of the Thesis .....</b>	<b>11</b>
<b>Chapter 2: Literature Review—Substance Use and Sexual Risk-taking among Men who have Sex with Men .....</b>	<b>13</b>
<b>Patterns of Substance Use among MSM.....</b>	<b>13</b>
<b>Substances Commonly Used among MSM in Australia .....</b>	<b>15</b>
Alcohol.....	15
Stimulants.....	16
Amyl nitrite.....	17
Cannabis.....	18
<b>Historical, Cultural and Societal Factors, and Contexts of Substance         Use.....</b>	<b>19</b>
<b>Substance Use and Sexual Risk-taking among MSM.....</b>	<b>23</b>
<b>Theories regarding the Relationships between Substance Use and         Sexual Risk-taking among MSM .....</b>	<b>27</b>
Substance-related expectancies.....	29
Risk-taking personality characteristics.....	34
Substance related expectancies and risk-taking personality characteristics.....	35

- Aims of the Research ..... 36**
- Significance of the Research ..... 39**
- Chapter 3: Phase 1—Qualitative Study, the Consequences of Substance Use among Gay and Bisexual Men: A Consensual Qualitative Research Analysis ..... 41**
- Purpose of the Study..... 41**
- Introduction..... 41**
- Method ..... 44**
- Sample..... 47**
  - Interviewees..... 47
  - Judges and interviewer. .... 47
- Procedure and Measures..... 48**
  - Small Group Discussion ..... 49
  - Interviews ..... 49
- Method of analysis ..... 50**
- Results ..... 50**
  - Sample characteristics. .... 50
- Main Findings ..... 51**
  - Domain 1: Altered cognitive functioning..... 53
  - Domain 2: Altered mood state..... 55
  - Domain 3: Impact on social interaction. .... 56
  - Domain 4: Effects on the body..... 59
  - Domain 5: Impact on sexual activity..... 60
  - Domain 6: Impact on sexual risk-taking. .... 63
  - Domain 7: Perception of sexual experience..... 65
  - Domain 8: Changes to sexual arousal. .... 65
  - Domain 9: Heightened sensation..... 66
  - Domain 10: Relaxation..... 67
  - Domain 11: Disinhibition..... 67
  - Domain 12: Impact on energy/activity level. .... 68
  - Domain 13: Numbing..... 68
  - Substance-specific Comparisons..... 69
  - Poly-substance use. .... 72
- Discussion ..... 73**
- Substance Use and the Transformative Experiences of Gay and Bisexual Men..... 73**
- What is the Interface between Substance Use, Sexual Activity and Sexual Risk-taking?..... 77**
- Implications for Prevention and Interventions ..... 78**
- Limitations..... 78**
- Future Research..... 78**
- Chapter Summary ..... 79**

<b>Chapter 4: Phase 2—Development of the Cannabis Expectancy</b>	
<b>Questionnaire for Men who have Sex with Men (CEQ-MSM): A</b>	
<b>Measure of Substance-related Beliefs .....</b>	<b>80</b>
<b>Purpose of the Study.....</b>	<b>80</b>
<b>Introduction .....</b>	<b>80</b>
<b>Method.....</b>	<b>83</b>
Qualitative phase.....	83
<b>Refinement of the Measure.....</b>	<b>83</b>
<b>Administration .....</b>	<b>84</b>
<b>Results.....</b>	<b>84</b>
Data analysis. ....	84
Demographics. ....	85
Substance use. ....	87
<b>Item Selection Through EFA.....</b>	<b>87</b>
<b>Evaluation of Factor Performance: Exploratory Sample.....</b>	<b>89</b>
Predictive validity. ....	89
Discriminant validity.....	89
Correlations. ....	91
Reliability. ....	92
<b>Discussion .....</b>	<b>92</b>
Implications.....	93
Limitations and future research.....	95
<b>Chapter Summary .....</b>	<b>95</b>
<b>Chapter 5: Phase 2—Development of the Drinking Expectancy</b>	
<b>Questionnaire for Men who have Sex with Men (DEQ-MSM): A</b>	
<b>Measure of Substance-related Beliefs .....</b>	<b>97</b>
<b>Purpose of the Study.....</b>	<b>97</b>
<b>Introduction .....</b>	<b>97</b>
<b>Method.....</b>	<b>97</b>
Qualitative. ....	97
Refinement. ....	97
Administration.....	98
<b>Results.....</b>	<b>98</b>
Data analysis. ....	98
Demographics. ....	99
Substance use. ....	100
Item selection through EFA. ....	100
<b>Evaluation of Factor Performance: Exploratory Sample.....</b>	<b>101</b>
Predictive validity: Prediction of consumption of alcohol.....	101
Discriminant validity.....	102
Correlations. ....	105
Reliability. ....	106
<b>Discussion .....</b>	<b>106</b>

Implications.....	108
Limitations.....	110
Future research.....	110
<b>Chapter Summary .....</b>	<b>110</b>
<b>Chapter 6: Phase 2—Development of the Amyl Nitrite Expectancy</b>	
<b>Questionnaire for Men who have Sex with Men (AEQ-MSM): A</b>	
<b>Measure of Substance-related Beliefs .....</b>	<b>111</b>
<b>Purpose of the Study.....</b>	<b>111</b>
<b>Introduction.....</b>	<b>111</b>
<b>Method .....</b>	<b>112</b>
Qualitative.....	112
Refinement.....	112
Administration.....	112
<b>Results.....</b>	<b>112</b>
Data analysis.....	112
Demographics.....	113
Substance use.....	114
Item selection through EFA.....	115
<b>Evaluation of Factor Performance: Exploratory Sample.....</b>	<b>116</b>
Predictive validity: Prediction of amyl nitrite use.....	116
Discriminant validity.....	117
Correlations.....	119
Reliability.....	120
<b>Discussion .....</b>	<b>120</b>
Implications.....	122
Limitations.....	123
Future research.....	123
<b>Chapter Summary .....</b>	<b>124</b>
<b>Chapter 7: Phase 2—Development of the Stimulant Expectancy</b>	
<b>Questionnaire for Men who have Sex with Men (SEQ-MSM): A</b>	
<b>Measure of Substance-related Beliefs .....</b>	<b>125</b>
<b>Purpose of the Study.....</b>	<b>125</b>
<b>Introduction.....</b>	<b>125</b>
<b>Method .....</b>	<b>125</b>
Qualitative.....	125
Refinement.....	125
Administration.....	126
<b>Results.....</b>	<b>126</b>
Data analysis.....	126
Demographics.....	127
Substance use.....	128
Item selection through EFA.....	129
<b>Evaluation of Factor Performance: Exploratory Sample.....</b>	<b>130</b>
Predictive validity: Prediction of stimulant use.....	130

Discriminant validity.....	131
Correlations.....	133
Reliability.....	133
<b>Discussion .....</b>	<b>134</b>
Implications.....	136
Limitations.....	136
Future research.....	137
<b>Chapter Summary .....</b>	<b>137</b>
<b>Chapter 8: The Predictive Utility of Substance-related Expectancies, Substance Use and Novelty-seeking Personality Characteristics on HIV Risk Behaviour among Gay and Bisexual Men.....</b>	<b>139</b>
<b>Purpose of the Study.....</b>	<b>139</b>
<b>Introduction .....</b>	<b>139</b>
Substance-related expectancies.....	141
Substance related expectancies and risk-taking personality characteristics.....	143
Model tested.....	143
<b>Method.....</b>	<b>145</b>
Participants.....	145
Procedure.....	145
Measures.....	146
<b>Results.....</b>	<b>149</b>
Data analysis.....	149
Data screening.....	149
Demographics.....	150
Gay community affiliation.....	151
Substance use.....	151
Sexual risk behaviour.....	152
Novelty-seeking.....	153
Are expectancies associated with consumption patterns?.....	153
Is UAI associated with consumption patterns?.....	154
Are expectancies associated with UAI?.....	155
Associations between novelty-seeking and substance use, expectancies and UAI.....	155
Predicting UAI based on hypothesised model.....	156
<b>Discussion .....</b>	<b>164</b>
<b>Implications.....</b>	<b>168</b>
Limitations and future research.....	169
<b>Chapter Summary .....</b>	<b>169</b>
<b>Chapter 9: Discussion and Conclusions .....</b>	<b>170</b>
<b>Purpose and Overview of the Research.....</b>	<b>170</b>
The consequences of substance use in a community sample of MSM.....	172
Development of qualitative themes.....	172
Development of an expectancy profile.....	173
Perceived reinforcement associated with each substance type.....	173

Testing a model of HIV risk behaviour: Substance use, expectancies and novelty-seeking.....	174
Summary of unique contributions of the program of research.....	175
Contribution to theory.....	176
<b>Implications.....</b>	<b>178</b>
Development of expectancies.....	178
Health promotion and HIV prevention.....	179
<b>Clinical Applications.....</b>	<b>183</b>
<b>Strengths and Limitations of the Research.....</b>	<b>186</b>
<b>Future Directions.....</b>	<b>191</b>
<b>Conclusion.....</b>	<b>195</b>
<b>References.....</b>	<b>197</b>
<b>Appendix A: Invitation letter for panel member.....</b>	<b>235</b>
<b>Appendix B: Expectancy items for panel review.....</b>	<b>236</b>
<b>Appendix C: Participant information sheet, group discussion.....</b>	<b>253</b>
<b>Appendix D: Participant information sheet, interviews.....</b>	<b>254</b>
<b>Appendix E: Consent form (Phase 1).....</b>	<b>255</b>
<b>Appendix F: Participant information sheet (Phase 2).....</b>	<b>256</b>
<b>Appendix G: Consent form (Phase 2).....</b>	<b>257</b>
<b>Appendix H: Participant information sheet and consent form (Phase 3).....</b>	<b>258</b>
<b>Appendix I: Demographics form (Phase 1).....</b>	<b>259</b>
<b>Appendix J: Small group discussion questions (Phase 1).....</b>	<b>261</b>
<b>Appendix K: Interview questions (Phase 1).....</b>	<b>262</b>
<b>Appendix L: Demographics and substance use history form (Phase 2).....</b>	<b>263</b>
<b>Appendix M: Questionnaire protocol (Phase 2).....</b>	<b>266</b>
<b>Appendix N: Demographics form (Phase 3).....</b>	<b>279</b>
<b>Appendix O: Substance use history form (Phase 3).....</b>	<b>281</b>
<b>Appendix P: Questionnaire protocol, SEP-MSM (Phase 3).....</b>	<b>283</b>
<b>Appendix Q: Questionnaire protocol, sexual behaviour (Phase 3).....</b>	<b>288</b>
<b>Appendix R: Questionnaire protocol, TCI-125 NS (Phase 3).....</b>	<b>289</b>

### List of Tables

Table 1:	Factors comprising the four expectancy measures of the SEP-MSM.....	32
Table 2:	Results of qualitative analysis of gay/bisexual men's beliefs regarding consequences of substance use .....	52
Table 3:	Results of qualitative analysis of gay/bisexual men's substance-specific beliefs regarding consequences of substance use .....	69
Table 4:	Items comprising the CEQ-MSM (including M and SD) .....	86
Table 5:	Factor analysis pattern matrix for the CEQ-MSM .....	88
Table 6:	Hierarchical regression analyses with CEQ-MSM factors predicting cannabis use .....	89
Table 7:	Zero-order correlations of the CEQ-MSM factors in the exploratory sample .....	91
Table 8:	Zero-order correlations of the CEQ-MSM factors and cannabis use in the past 30 days in the exploratory sample .....	91
Table 9:	Items comprising the DEQ-MSM (including M and SD).....	99
Table 10:	Factor analysis pattern matrix of the DEQ-MSM.....	101
Table 11:	Hierarchical regression analyses with DEQ-MSM factors predicting alcohol use .....	102
Table 12:	Zero-order correlations of the DEQ-MSM factors in the exploratory sample .....	105
Table 13:	Zero-order correlations of the DEQ-MSM factors and alcohol use in the past 30 days in the exploratory sample .....	105
Table 14:	Items comprising the AEQ-MSM (including M and SD).....	113
Table 15:	Factor analysis pattern matrix for the AEQ-MSM.....	116
Table 16:	Hierarchical regression analyses with AEQ-MSM factors predicting amyl nitrite use.....	117
Table 17:	Zero-order correlations of the AEQ-MSM factors in the exploratory sample .....	119
Table 18:	Zero-order correlations of the AEQ-MSM factors and amyl nitrite use in the past 30 days in the exploratory sample.....	119
Table 19:	Items comprising the SEQ-MSM (including M and SD).....	127
Table 20:	Factor analysis pattern matrix for SEQ-MSM .....	130
Table 21:	Hierarchical regression analyses with SEQ-MSM factors predicting stimulant use.....	131
Table 22:	Zero-order correlations of the SEQ-MSM factors in the exploratory sample .....	133
Table 23:	Zero-order correlations of the SEQ-MSM factors and frequency of stimulant use in the past 30 days in the exploratory sample .....	133
Table 24:	DFA significance values for comparisons by substance type.....	158

Table 25: DFA statistical data for significant model comparisons for alcohol and stimulants..... 159

Table 26: Mean values (standard deviations) and ANOVA results for DFA model: Alcohol (QF past in the month), expectancy total score and novelty seeking..... 160

Table 27: Standardised canonical coefficients and structure weights from the DFA model: Alcohol (QF in the past month), expectancy total score and novelty seeking..... 160

Table 28: Mean values (standard deviations) and ANOVA results for DFA model: Alcohol (QF in the past month), expectancy factor scores and novelty seeking ..... 161

Table 29: Standardised canonical coefficients and structure weights from the DFA model: Alcohol (QF in the past month), expectancy factor scores and novelty seeking ..... 162

Table 30: Mean values (standard deviations) and ANOVA results for DFA model: Stimulants (frequency in the past month), expectancy total score and novelty seeking..... 163

Table 31: Standardised canonical coefficients and structure weights from the DFA model: Stimulants (frequency in the past three months), expectancy total score and novelty seeking ..... 163

**List of Figures**

Figure 1: Predictive model testing the contributions of substance use, expectancies and novelty seeking on UAI in conjunction with substance use .....	39
Figure 2: Methodology of the program of research .....	46
Figure 3: Expectancy scores among recent and non-recent cannabis users .....	90
Figure 4: Expectancy scores among recent and non-recent alcohol users.....	103
Figure 5: Expectancy scores among high alcohol users and low alcohol users ...	104
Figure 6: Expectancy scores among recent and non-recent amyl nitrite users.....	118
Figure 7: Expectancy scores among recent and non-recent stimulant users.....	132
Figure 8: Factors comprising the expectancy measures of the SEP-MSM .....	147
Figure 9: Predictive model to test in future research, based on current findings and SCT.....	167
Figure 10: Integrated Theoretical Model for predicting behaviour (Fishbein & Yzer, 2003).....	168

### List of Abbreviations

AEQ-MSM	Amyl Nitrite Expectancy Questionnaire for Men who have Sex with Men
AIDS	Acquired Immune Deficiency Syndrome
ANOVA	Analysis of Variance
CALD	Culturally and/or Linguistically Diverse
CBT	Cognitive Behavioural Therapy
CDCP	Center for Disease Control and Prevention
CEQ-MSM	Cannabis Expectancy Questionnaire for Men who have Sex with Men
CFA	Confirmatory Factor Analysis
CQR	Consensual Qualitative Research
DEQ-MSM	Drinking Expectancy Questionnaire for Men who have Sex with Men
DF	Discriminant Function
DFA	Discriminant Function Analysis
EFA	Exploratory Factor Analysis
GLBT	Gay, Lesbian, Bisexual and Transgender
HIV	Human Immunodeficiency Virus
LSD	d-Lysergic Acid Diethylamide
M	Mean
MI	Motivational Interviewing
MSM	Men who have Sex with Men
QF	Quantity x Frequency
SCT	Social-Cognitive Theory
SD	Standard Deviation
SEM	Structural Equation Modelling
SEP-MSM	Substance Expectancy Profile for Men who have Sex with Men
SEQ-MSM	Stimulant Expectancy Questionnaire for Men who have Sex with Men
SOPV	Sex on Premises Venue
TCI-125 NS	Temperament and Character Inventory – Novelty-seeking Scale
UAI	Unprotected Anal Intercourse

### Statement of Original Authorship

The work contained in this thesis has not been previously submitted to meet the requirements of an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where reference is made.

Signature

Date

Portions of this research have been previously published:

Mullens, A.B. (2005). Substance use and sexual risk-taking among men who have sex with men (MSM): Implications for health promotion and HIV prevention. Brisbane, Qld: Commissioned by Queensland Association for Healthy Communities. Retrieved 5 July 2010. from [http://www.qahc.org.au/files/shared/docs/Substance\\_use\\_and\\_msm.pdf](http://www.qahc.org.au/files/shared/docs/Substance_use_and_msm.pdf)

Mullens, A.B., Young, R.McD., Hamernik, E., & Dunne, M. (2009). The consequences of substance use among gay and bisexual men: A qualitative analysis. *Sexual Health*, 6, 139-152.

Mullens, A.B., Young, R.McD., Dunne, M., & Norton, G. (2010). The Cannabis Expectancy Questionnaire for Men who have Sex with Men (CEQ-MSM): A measure of substance-related beliefs. *Addictive Behaviors*, 35, 616-619.

Mullens, A.B., Young, R.McD., Dunne, M., & Norton, G. (2011). The Drinking Expectancy Profile for Men who have Sex with Men (DEQ-MSM): A measure of substance-related beliefs. *Drug & Alcohol Review*, 30, 372-380.

Mullens, A.B., Young, R.McD., Dunne, M., & Norton, G. (in press). The Amyl Nitrite Expectancy Profile for Men who have Sex with Men (AEQ-MSM): A measure of substance-related beliefs. *Substance Use & Misuse*.

Portions of this research have been previously presented at the following state-wide, national and international forums:

Mullens, A.B. Predicting unsafe sex among gay and bisexual men: Implications for HIV prevention. Presented at annual Queensland HIV Research Forum, University of Queensland School of Medicine, Brisbane. May, 2011.

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Input provided to Queensland Positive People for developing a printed resource for HIV-infected people entitled: *Drugs: Pleasure or pain? Recreation or risk? Hero or villain?* 2009-2010.

Input provided to Queensland Association for Healthy Communities (formerly Queensland AIDS Council) for developing and conducting a multi-faceted alcohol and drug campaign for members of the GLBT community throughout Queensland, 2005-2008.

Input provided for collaborative research project between DrugArm, Queensland Health and Queensland Association for Healthy Communities to conduct a needs analysis and training for alcohol and drug staff for to work more effectively with GLBT clients, 2010-present.

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- Dr Gregory Payton, Center for HIV Educational Studies and Training (CHEST), New York City, USA. April, 2010.
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## **Chapter 1: Introduction**

### **Brief Overview of the Research**

This research had three objectives: 1) it examined the nature of cognitions that represent the sexual and non-sexual reinforcing consequences across the range of commonly used substances among men who have sex with men (MSM); 2) it extended upon existing social-cognitive theory (SCT) to develop appropriate and relevant tools for measuring substance-related outcome expectancies among this group; and 3) it explored a conceptual model and tested the relative contributions of substance use, expectancies and novelty-seeking personality characteristics in discriminating MSM who do or do not engage in HIV risk behaviour while under the influence of substances.

### **HIV among MSM**

Trends indicate sustained increases in new HIV diagnoses despite extensive efforts to promote safer sexual practices, and the consequences of engaging in higher risk sexual practices being well known [Buunk & Dijkstra, 2001; Center for Disease Control and Prevention (CDCP), 2007; Kelly & Kalichman, 1998; Queensland Health, 2008; Wolitski, Valdiserri, Denning, & Levine, 2001]. In the absence of a vaccine or 'cure', the primary means of quelling the HIV epidemic is increased understanding of modifiable factors that contribute to sexual risk behaviours, and promoting safer sexual practices based on these data (Gordon, Forsyth, & Stall, 2005; Leigh & Stall, 1993, Kalichman & Weinhardt, 2001; Kowalewski, Henson, & Longshore, 1997; Woolf & Maisto, 2010).

It has been estimated that approximately 1-3% of the Australian male population *identifies* as gay or bisexual, while rates of same-sex attraction and sexual behaviour are likely to be significantly higher (Prestage, Ferris, Grierson, Thorpe, Zablotska, & Imrie, 2008). Gay and other MSM, comprise the majority of recently acquired new cases of HIV (82%) within Australia (National Centre in HIV Epidemiology and Clinical Research, 2009), and approximately 10-55% of groups recruited in previous research of MSM are HIV-infected. These are not population based studies, but are based on convenience samples with higher rates of HIV infection related to sampling at gay community events and specific geographic areas (e.g., inner Sydney; Prestage et al., 2008). Results from a recent *Gay Community Periodic Survey* in Sydney, indicate that 7.7% were HIV-positive while 11.2% were unsure of their serostatus (Frankland, Lee, Zablotska, Prestage, Down, Holt, & Lake, 2009).

### **Substance Use among MSM**

MSM experience higher rates of substance misuse and poly-substance use than members of the general population. In addition, MSM report higher rates of *certain* substances (e.g., amphetamines, amyl nitrite, cannabis; Cabaj, 2000, Frankland, Zablotska, Prestage, O'Connor & Martin, 2008; Hull, Rawstorne, Zablotska, Prestage, Kippax, & Staunton, 2005, Mattison, Ross, Wolfson, Franklin, & HNRC Group, 2001; Pitts, Smith, Mitchell, & Patel, 2006). Substance use has been proposed as facilitating coping with minority stress (McKirnan & Peterson, 1988; Myers, Rowe, Tudiver, Kurtz, Jackson, & Orr, 1992), and with attempting to decrease awareness of HIV risk (McKirnan & Peterson, 1988; McKirnan, Ostrow, & Hope, 1996). Substance use has been historically embedded within gay subculture

(Greenwood, White, Page-Shafer, Bein, Osmond, Paul, & Stall 2001; Lewis & Ross, 1995; Slavin, 2004c). Bars and nightclubs have been central places where MSM have felt free to socialise without fear of stigmatisation and substance use can help to maintain a sense of community (Bell & Weinberg, 1978; Fergus, Lewis, Darbes, & Butterfield, 2005; Stall & Purcell, 2000). There are less normative influences against substance use or misuse within the gay community. Alcohol and other drug use is associated with gay party cultures (Prestage et al., 2007a), more sexually adventurous practices (Prestage et al., 2007b; Smith, Worth, & Kippax, 2004) and enhancing sexual experiences (Green & Halkitis, 2006). These are likely to contribute to higher rates of use and misuse (Cabaj, 2000; Herdt, 1997; Knox, Kippax, Crawford, Prestage, & Van de Ven, 1999).

Substance use has been paired with contexts among MSM (Fisher, Bang & Kapiga 2007; Ostrow, 1996; Slavin, 2004c) such as dance parties (e.g., raves, circuit parties; Lee, Galanter, Dermatis & McDowell, 2003; Lewis & Ross, 1995; Ross, Mattison, & Franklin, 2003), sexual activity (Halkitis & Parsons, 2002; Mullens, Young, Dunne, & Hamernik, 2009b; Semple, Patterson, & Grant, 2002) and attendance at sex on premises venues (SOPV; Binson, Woods, Pollack, Paul, Stall, & Catania, 2001; Halkitis & Parsons, 2002; Mullens, Staunton, Debattista, Hamernik, & Gill, 2009a). For example, the inhalant amyl nitrite is used almost exclusively during sexual contact among MSM or at dance parties to heighten sensation (French & Power, 1997; Lampinen, Mattheis, Chan, & Hogg, 2007; Lange, Haertsen, Hickey, Snyder, Dax & Jaffe, 1988; Slavin, 2001). Gorman and colleagues (1997) noted that MSM perceive “intense associations between methamphetamine use and sexual behaviour” (p. 109). Poly-drug use further heightens specific substance related effects, including prolonging desired effects particularly in sexual contexts (Aldridge

& Measham, 1999; French & Power, 1997; Chu et al., 2003; Romanelli & Smith, 2004; Slavin, 2001). Substance use is associated with specific sexual practices such as amphetamine use and 'barebacking' (e.g., MSM intentionally engaging in unsafe sexual practices; Halkitis, Parsons, & Wilton, 2003; Ostrow, 2000; Parsons & Bimbi, 2007).

### **Substance Use and Sexual Risk Behaviour among MSM**

Substantial previous research indicates that substance use is a salient risk factor for engaging in specific sexual behaviours (e.g., UAI), which carries heightened risks among MSM (e.g., HIV transmission, sexually transmissible infections), particularly among some drug-using MSM (Myers et al., 2004). However, research in this area is complex and findings have been inconsistent, suggesting that another underlying variable or variables moderate the relationships between substance use and sexual risk-taking. The main theories examining potential mechanisms include (Woolf & Maisto, 2009): alcohol 'myopia' theory (Steele & Josephs, 1990; Vanable, McKirnan, Buchbinder, Bartholow, Douglas, & Judson, 2004), SCT (emphasising simple expectancy theory; Bimbi, Nanin, Parsons, Visioso, Missildine, & Frost, 2006; Parsons & Bimbi, 2007) and cognitive escape theory (McKirnan et al., 1996; McKirnan, Vanable, Ostrow, & Hope, 2001). Each of these implies the functional or strategic use of substances. Risk-taking personality characteristics have also been demonstrated to underlie both substance use and sexual risk-taking (Crawford et al., 2003; Dolezal, Meyer-Bahlburg, Remien, & Petkova, 1997; Dudley, Rostovsky, Korfhage, & Zimmerman 2004; Kalichman, Heckman, & Kelly; 1996; Kalichman, Tannenbaum, & Nicholson, 1998) and are likely to be relevant to these functional benefits.

### **Expectancy Theory: Exploring the Relationships between Substance Use and Sexual Risk-taking**

Based on extensive previous research among the general population, and associated clinical implications, expectancy theory holds considerable promise as a mechanism to determine the relationships between substance use and sexual risk-taking. Substance-related outcome expectancies may also be useful in identifying MSM whose substance use is a significant factor in UAI. Expectancies refer to an individual's beliefs about the consequences or effects of a given action (e.g., substance use), which are related to personal experiences, vicarious experiences or an acquired concept about appropriate behaviour (Weinhardt, Otto-Salaj, Brondino, Norberg, & Kalichman, 2002). Previous research indicates that modifying substance related expectancies results in the reduction of substance use and perceived reinforcing outcomes (Darkes & Goldman, 1993; Fillmore & Vogel-Sprott, 1995; LaBrie, Schiffman, & Earleywine, 2002). Further research using expectancy theory as a theoretical model is likely to be useful in advancing clinical interventions and health promotion (Kalichman, Weinhardt, DiFonzo, Austin, & Webster 2002; McKirnan et al., 2001; Stall & Purcell, 2000).

Expectancies have particular utility in advancing health promotion, screening and clinical interventions, whereas, the implications of other hypothesised factors (e.g., risk-taking personality characteristics) are less amenable to change (Dolezal et al., 1997; Goldman, 1994). Expectancies also provide a more suitable approach to intervention efforts, particularly among those living with HIV, as the impact of this health condition could reduce sensation seeking tendencies (Kalichman et al., 2002). Thus, for the purposes of this multi-phase program of research, the focus has

attempted to further advance a theoretical model regarding sexual risk-taking emphasising the potential role of psychological and demographic factors to discriminate MSM who do or do not engage in UAI while under the influence of substances. The primary psychological factor to be examined will be expectancies.

Progressing understanding of psychological factors that underlie substance use among MSM and the subsequent associated harm (e.g., HIV transmission), and testing the role of expectancies in mediating these relationships, has been hampered by a lack of relevant expectancy measures for MSM and those who are HIV-infected (Maisto, McGinnis, Cook, Conigliaro, Bryant, & Justice, 2010; Mullens et al., 2011; *in press*). To date, no known, comprehensive expectancy measures exist that have been specifically designed for use among MSM and are appropriate for use in this group across the *range* of commonly used substances. Equally, measures which include both sexual and non-sexual outcomes to fully examine both direct and indirect influences on UAI, are rare (Bimbi et al., 2004; Mullens, Young, Dunne, & Norton, 2010; Schuper, Joharchi, Irvin, & Rehm, 2009). Lack of measures specific to MSM is particularly of concern as previous research regarding expectancy theory demonstrates that beliefs about the effects of a given substance are related to cultural factors (Kalichman et al., 1998; Peele, 1997; Young & Knight, 1989). As substance use is part of unique social and sexual context within the gay community, related beliefs are likely to be unique and reflect these differences among MSM. Further, no known expectancy measure exists regarding outcome expectancies for use of amyl nitrite. Amyl nitrite is an inhalant commonly used to enhance sexual experiences among MSM (Siegel, Alvaro, Crano, Skenderian, Lac, & Patel, 2009).

### **Aims of the Research**

This research examined the nature of cognitions that represent the sexual and non-sexual reinforcing consequences across the range of commonly used substances. It also extended upon existing SCT and developed appropriate and relevant tools for measuring substance-related outcome expectancies among this group. Based on findings from the two previous objectives, and a review of relevant research literature, this research tested a multi-dimensional model incorporating factors that uniquely contribute to predicting HIV risk behaviour. The model tested included relevant demographic factors, substance use patterns, substance-related expectancies and personality characteristics—as HIV risk behaviour is unlikely to be wholly attributable to a single factor (Kalichman et al., 1998). Specifically, this program of research tested the relative contributions of substance use, expectancies and novelty-seeking personality characteristics in discriminating MSM who do or do not engage in HIV risk behaviour while under the influence of substances, across four commonly used substance types.

Long standing debate exists in the field of substance misuse regarding the relative contributions of environmental (e.g., social learning; see Bandura, 1977; 1978; 1986; Jones, Corbett, & Fromme, 2001; Marlatt, Demming, & Reid, 1973; Marlatt & Gordon, 1985) versus biological (e.g., genetic, personality; see Cloninger, 1987; Cloninger, Przybeck, & Svrakic, 1991; Jellinek, 1960; McGue, 1995) determinants. Review articles emphasise the importance of considering the effects of *both* environmental and biological factors operating together to influence patterns of substance use and associated harm (e.g., Enoch, 2006; Heath & Nelson, 2002; Rutter, 2002; Young, Lawford, Nutting, & Noble, 2004). A combined approach offers

distinct advantages, as the relative contributions of each approach and the ways in which these two forces influence each other can be better understood (Engles & van der Zwaluw, 2008; Kaufman et al., 2007; Rhee, Hewitt, Young, Corley, Crowley, & Stallings, 2006; Rutter, Moffitt, & Caspi, 2006; Rutter & Silberg, 2002).

In the current program of research, social-cognitive (learning) and personality variables were both included to provide a comparative review of the strength of evidence for behaviour related to how we learn (from multiple inputs, including social learning and personal drug use) versus how we are biologically 'hard-wired'. Intuitively, both are likely to contribute to substance use patterns, and operate in a synergistic manner. Expectancies and novelty seeking constructs were selected over other potential social-cognitive (e.g., self-efficacy) and personality (e.g., harm avoidance) variables, as they have demonstrated a stronger history of empirical support (Cloninger, Przybeck, Svrakic, & Wetzel, 1994; Cloninger, Svrakic & Przybeck, 1993; Deditius-Island, Heide, & Caruso, 2002; Hull & Young, 1983; Oei & Young, 1987; Ono et al., 2002; Young & Oei, 1993).

## **Research Plan**

*Phase 1.* This examined how MSM perceive the effects of their substance use on their thoughts, feelings and behaviours (including sexual behaviours).

Information was attained qualitatively via a small group discussion with MSM and face-to-face interviews in Phase 1 and resulted in the establishment of key themes, as well as the generation of items incorporated into subsequent substance-related alcohol and drug expectancy measures (Phase 2). Results from Study 1 helped to inform the development of a multidimensional model incorporating demographic

factors, novelty-seeking, substance use and sexual risk-taking that was tested in Phase 3.

*Phase 2.* This phase developed measures of MSM relevant expectancies regarding substance use, across the range of commonly used substances (alcohol, cannabis, amyl nitrite and stimulants), that possessed sound psychometric properties and was culturally appropriate for use among this group. All possible expectancy items were refined by an expert panel and members of the gay community, and then administered online and rated by a state-wide community sample of MSM. Statistical techniques (e.g., exploratory factor analysis; EFA) were used to further refine and substantiate the measures. The measures included expectancy items extracted from interview transcripts (Phase 1) and were incorporated into Phase 3.

*Phase 3.* A cross-sectional online questionnaire was administered to a subsequent national community sample of MSM to measure the prevalence of demographic factors (e.g., age, ethnicity, affiliation with the gay community, relationship status, living in metropolitan or regional or rural areas, education level, employment status), sexual risk-taking behaviours, substance use patterns, substance-related expectancies and novelty-seeking personality characteristics throughout Australia in order to better understand the relationships between substance use and sexual risk-taking and other potentially mediating psychological or demographic factors.

### **Significance of the Research**

Based on SCT and previous research among the general population and MSM it was hypothesised that substance use, expectancies and novelty-seeking personality

characteristics will provide unique contributions in discriminating those who do or do not report UAI in conjunction with substance use. It was also hypothesised that the predictive patterns of these contributing factors will vary across substance types, given the diverse pharmacological properties and contexts of use across the range of substances under investigation.

Information gained from this program of research will increase understanding of perceived reinforcement across a range of specific substances used among MSM, and the extent to which UAI (while under the influence of substances) is related to HIV transmission. Identifying and modifying factors that contribute to substance use and associations with sexual risk-taking could significantly reduce UAI and subsequent HIV infection (Schuper et al., 2009). Examination of expectancies common to psychoactive substances could be useful targets for matters of intervention and practice. More specifically, some of the applications of the expectancy measures to be developed and associated research findings could include:

- identifying MSM who are using substances problematically and engaging in sexual risk taking, based on their beliefs or expectancies regarding substance use and associated risk factors, and providing preventative education;
- tailoring treatment of substance use issues among MSM by incorporating cognitive therapy to challenge unhelpful beliefs about their substance use and/or establishing alternatives to substance use which can serve similar functions but in a less harmful manner;
- gaining a better understanding of broader psychosocial needs related to changing substance use patterns among this group and impediments to

changing substance-related behaviours to better meet the needs of MSM communities; and

- incorporating commonly held beliefs among MSM about the effects of substance use into broad-scale HIV prevention and health promotion efforts in order to develop more relevant and effective campaigns.

### **Structure of the Thesis**

The thesis has nine chapters. Chapter 1 provides an examination of the aims of the research, and advancing the multi-dimensional theoretical model under consideration. Building on the thesis overview provided in this chapter, Chapter 2 provides a literature review including a description of commonly used, patterns of substance use, previous research regarding substance use and sexual risk-taking, and a model for understanding the relationships between substance use and HIV risk behaviour.

Chapters 3 to 8 present the studies conducted as part of this research. In each of these chapters, the rationale, background and methodology of each study are detailed. Chapter 3 describes the first phase of research, which consisted of a qualitative study regarding the reinforcing consequences of substance use among a gay community sample. Because of the comprehensive nature of results for the second phase of research, Phase 2 is presented in four chapters (Chapters 4 to 7) relevant to the quantitative development and psychometric properties of four new measures developed to assess substance-related outcome expectancies that correspond with each substance type—cannabis (Chapter 4), alcohol (Chapter 5), stimulants (Chapter 6), and amyl nitrite (Chapter 7). Chapter 8 contains a

quantitative examination of the model tested and relevant factors that discriminate between MSM who do or do not engage in UAI while under the influence of substance use.

The final chapter (Chapter 9) highlights the significance of this research and the overall findings; integrating results and implications across the studies. Chapter 9 also details the strengths and limitations of this program of research and offers some suggestions for future health promotion, HIV prevention, clinical interventions and research.

## **Chapter 2: Literature Review—Substance Use and Sexual Risk-taking among Men who have Sex with Men**

### **Patterns of Substance Use among MSM**

Epidemiological studies within Australia and internationally indicate significantly higher rates of substance use among MSM (Cabaj, 2000; Cochran, Keenan, Schober, & Mays, 2000; Crawford, Kippax, Rodden, Donohoe, & Van de Ven, 1998; Pitts, et al., 2006) than in the general population. Studies involving gay and lesbian populations suggest an incidence of substance misuse among samples from developed countries of approximately 30%, with a range between 28-35%, which contrasts with an incidence of 10-12% among the general population (Cabaj, 2000). Australian prevalence rates of illicit, recreational substance use have been estimated to be 17% among the general population [Australian Institute of Health and Welfare (AIHW), 2007; Commonwealth Department of Health and Family Services, 1996] and as high as 53% among MSM (Crawford et al., 1998; Pitts et al., 2006). Further, individuals living with HIV (comprised largely of MSM) also use alcohol and other substances at rates higher than that of the general population (Meyerhoff, 2001; Samet, Cheng, Libman, Nunes, Alperen, & Saitz, 2003).

Other studies have demonstrated comparable rates of alcohol and drug use and misuse among gay men and the general population (Drabble, Midanik, & Trocki, 2004; McKirman & Peterson, 1989; Stall & Wiley, 1988). It has also been suggested that gay men engage in increased poly-substance use over that of the general population (Hull et al., 2005; Pitts et al., 2006). In addition, *certain drugs* (e.g., amyl nitrite, amphetamines, cannabis) are more popular among this group (Frankland, Zablotska, Prestage, O'Connor, Martin, & Imrie, 2007; Stall, Coates, & Hoff, 1988).

According to Stall and colleagues (1988), few gay men typically use any one drug to excess suggesting lower rates of drug dependence, however the health risks associated with the nature of heavy use and the consequences of intoxication are considerable (e.g., HIV transmission; Mullens et al., 2009b; Smith, Lindsay, & Rosenthal, 1999).

Differences in patterns of drug use have been reported between MSM in Australia and MSM in similar, developed countries. For example, MSM in Australia are less likely to use injecting drugs than MSM in the USA and Europe and have lower rates of “harder” drug use (e.g., cocaine, heroin, opioids; e.g., Hamunen, Paakkari, & Kalso, 2009; Wiessing et al., 2008), and have lower representation within severely disadvantaged backgrounds (e.g., Haw & Hawton, 2011). Patterns of drug use may also remain more stable in Australia due to the primarily *recreational* nature of substance use (typically in social contexts) and the relatively stable supply of commonly used recreational substances. In addition, rates of substance use may be more stable because of sustained efforts within the gay community regarding substance misuse prevention and treatment, and increased funding for substance-related issues among the gay community as a national alcohol and drug funding priority (Ritter, 2007).

Researchers have noted some significant methodological problems in some of the previous research on prevalence rates of substance use or misuse among MSM. Some estimates of substance use have historically been limited by small samples and recruiting participants exclusively from bars (Cochran et al., 2000). Other limitations have included inconsistencies regarding how use or misuse has been measured across studies, poor or absent control groups, unrepresentative population

samples and failure to use uniform definitions of substance abuse or sexual identity (Cabaj, 2000). In addition, convenience based samples are sometimes associated with self-selection bias, as highly motivated volunteer samples may not be representative of the target group (Cochran & Mays, 2000).

### **Substances Commonly Used among MSM in Australia**

Based on broad-scale surveys conducted among MSM within Australia (e.g., Frankland et al., 2008; 2009; Hull et al., 2005; Knox et al., 1999), some of the most commonly used recreational drugs include alcohol, stimulants (e.g., amphetamines, crystal methamphetamine, ecstasy), amyl nitrite and cannabis. MSM also use a wide range of other recreational substances such as sildenafil citrate (Viagra<sup>®</sup>), cocaine, GHB, steroids and ketamine (Frankland et al., 2009). The following provides a brief overview regarding each of the most commonly used substance types.

#### **Alcohol.**

Alcohol is classed as a depressant, as it operates by slowing down the functions of the central nervous system. In smaller quantities, alcohol can induce feelings of relaxation and reduced inhibition, and alcohol is commonly used for its perceived effects on sociability, relaxation and sexual experiences (Critchlow, 1986; Maisto et al., 2010). However, depressants can also impair concentration and coordination and can reduce one's ability to deal with unexpected situations (Lopatko, McLean, Saunders, Young, Robinson, & Conigrave, 2002). Other short-term risks associated with alcohol use include dehydration, headaches, reduced performance, mood changes, impaired movement or coordination and increased risk of injuries or accidents (see Lopatko et al., 2002). Among individuals who are HIV-infected,

higher alcohol use has also been linked with more rapid disease progression (Samet et al., 2003).

### **Stimulants.**

This drug class refers to a variety of substances that release specific chemicals, or neurotransmitters, in the brain including: noradrenaline, dopamine and serotonin (Gorman et al., 1997), which is drunk, eaten, smoked, injected or absorbed via the rectum (Gorman, 1996). Individuals who use amphetamines report increased energy levels, alertness and enhanced self-confidence (Kaplan & Sadock, 1990) and amphetamine use is associated with social and sexual encounters (Darke, Ross, Cohen, Hando, & Hall, 1995). Use of amphetamines is also associated with headaches, dizziness, blurred vision, restlessness, psychosis and loss of coordination (see Latt, White, McLean, Lenton, Young, & Saunders, 2002). Some commonly used types of amphetamines include ecstasy, amphetamines, dexamphetamine and crystal methamphetamine. Specific features of crystal methamphetamine and ecstasy are described in further detail below.

***Crystal methamphetamine.*** Crystal methamphetamine (d-methamphetamine hydrochloride), also referred to as ‘crystal meth’, ‘crystal’, ‘ice’ and ‘Tina’ (Slavin, 2004b), is used via injection, smoking and swallowing. It creates feelings of intense pleasure, invulnerability and increased self-confidence due to the release of dopamine (Slavin, 2004a). As a stimulant, crystal methamphetamine can intensify emotions, increase energy, elevate self-esteem and heighten sexuality, while reducing inhibitions and impairing judgment (Gawin & Ellinwood, 1988; Halkitis, Mukherjee, & Palamar, 2007; Latt et al., 2002; Nakamura, Semple, Strathdee, & Patterson, 2009; Reback & Ditman, 1997). Use of stimulant drugs, such as crystal

methamphetamine, has been demonstrated to be an important part of a highly sexualised subculture among some gay men (Guss, 2002), and is associated with sexual risk-taking (Colfax & Shoptaw, 2005; Drumright, Patterson, & Strathdee, 2007; Nakamura et al., 2009), including HIV seroconversion data (Halkitis, Parsons, & Stirrat 2001).

***Ecstasy.*** MDMA, ecstasy (3, 4-methylenedioxy-methamphetamine) has been used in Australia for recreational purposes since the late 1980s (Ryder, Salmon & Walker, 2001). In addition to general properties of amphetamines, ecstasy is associated with hallucinogenic and emotional effects (e.g., increased affection and empathy, enhanced mood; Peters, Kok, & Abraham, 2007). Ecstasy is commonly used at raves and other dance parties (Peters et al., 2007; Klitzman, Pope, & Hudson, 2000; Lenton, Boys, & Norcross, 1997) and helps users to remain active (Calafat, Juan, Becona, & Mantecon 2008). However, ecstasy when combined with some medications used to manage HIV infection can result in fatal drug interactions (Harrington, Woodward, Hooton, & Horn, 1999; Henry, Jeffreys, & Dawling, 1992; Henry & Hill, 1998).

### **Amyl nitrite.**

This substance is a volatile liquid comprised of alcohol, sodium nitrite and sulphuric acid. Sometimes referred to as ‘poppers’ or ‘amyl’, this inhalant is primarily used to get high and is often used among gay men in sexual contexts (Lampinen et al., 2007; Lange et al., 1988). Amyl nitrite has been used over the past few decades to enhance physical pleasure during sexual activity (Everett, 1972; French & Power, 1998) and its use has been associated with increased libido, improved erectile functioning and enhanced sexual experiences (Israelstam, Lambert,

& Oki, 1978; Prestage, 2009). Some of the negative symptoms reported with its use include headache, minor burns, respiratory difficulties, poor coordination and balance, nausea, blurred vision and lethargy (French & Power, 1997). Inhalant use has also been associated with negative mental health outcomes (Sakai, Mikulich-Gilbertson, & Crowley, 2004). Chronic use of amyl nitrite has been linked with decreased immune functioning, which can contribute to HIV transmission to HIV-negative sexual partners (Lange et al., 1988) and HIV seroconversion (Marmor, Friedman-Kien, Lauberstein, Bryum, William, & D'onofrio, 1982; MacDonald, Elam, Hickson, Imrie, McGarrifle, & Fenton, 2008). Amyl nitrite is commonly used in conjunction with other drugs including erectile enhancing medications (e.g., Viagra<sup>®</sup>; Chu et al., 2003; Pantalone, Bimbi, & Parsons, 2008; Romanelli & Smith, 2004; Slavin, 2001).

### **Cannabis.**

Cannabis (delta-9-tetrahydrocannabinol or THC) is derived from the plant *cannabis sativa* and is used via smoking or ingestion. Cannabis contains over 400 different chemicals, which are referred to as cannabinoids (Grilly, 1994). Cannabis has typically been used for recreational, social and medicinal purposes for hundreds of years and is associated with the following effects: altered consciousness, mild euphoria, relaxation, distorted perceptions of time, talkativeness and an intensification of normal experiences (see Ryder et al., 2001; Todd, McLean, Krum, Martin, & Copeland, 2002), and tends to be less associated with sexual behaviour and sexual risk-taking than other recreational substances (Calafat et al., 2008). Negative consequences associated with its use include: dry mouth, increased heart rate and decreased sweating, and cannabis can cause impairments to memory and

cognition functioning, speaking abilities, problem solving and concept formation (Grilly, 1994).

### **Historical, Cultural and Societal Factors, and Contexts of Substance Use**

Gay and bisexual men often experience unique challenges related to discrimination and stigma (Herdt, 1997). It is well established that some of the most powerful institutions in society have historically rejected homosexuality, including various religions, health systems and the media (Finnegan & Cook, 1984). For example, homosexuality had been classified as an illness in the diagnostic manual of the American Psychiatric Association until 1973 (Meyer, 2003). These strong societal forces can significantly influence the identity development processes that occur among gay men and lesbians. Gay men commonly face a number of specific difficulties including social rejection and rejection from their families (Barrett, Bolan, Joy, Counts, Doll, & Harrison, 1995), and social stigma is associated with increased risk of psychological disorders (Cochran et al., 2003; Wright, Gronfein, & Owens, 2000) as well as increased barriers to accessing mental health services (Kaufman, Carlozzi, Boswell, Barnes, Wheller-Scruggs, & Levy, 1997).

Experiencing anti-gay discrimination has also been linked with increased frequency of UAI (Diaz, Ayala, & Bein, 2004; Jarama, Kennamer, Poppen, Hendricks, & Bradford, 2005). D'Augelli (1991) has identified four primary concerns among young gay university men: dealing with parents regarding sexual orientation, relationship problems, worry about AIDS, and anxiety and depression—which represent examples of gay specific stressors. Further, McKirnan and colleagues (1996) suggest that substance use among HIV-infected persons helps to cope with a chronic, life threatening illness and the stress of transmitting HIV to others.

These factors can negatively affect psychological well being and pose a significant risk for ongoing psychological problems. For example, the negative attitudes and feelings towards homosexuality that many MSM hold against themselves are related to their mental health (e.g., Halkitis, Moeller, Siconlfi, Jerome, Rogers, & Schillinger, 2008; Solomon, Kiang, Halkitis, Moeller, & Pappas, 2010), including: depression (Meyer, 1995), eating disorders (Brown, 1986), suicide (Rofes, 1983), alcoholism (Cabaj, 2000; Finnegan & Cook, 1984) and substance abuse (Cabaj, 2000; Glaus, 1988). Stereotypes about a particular group, such as homosexuals, can become hazardous when they are internalised (McLean & Link, 1994). Internalised homophobia (Huebner, Davis, Nemeroff, & Aiken, 2002) is a construct that describes the taking on of societal sentiments that reject homosexuality by gay and lesbian people. Individuals internalise the idealised values learned from society and culture and, when these fail to match reality, internal conflict can result (Amadio & Chung, 2004; Pearlin, 1993). Like individuals in the general population, some MSM use substances to help cope with such stressors (Myers et al., 1992; Williams, 2003; Young, Oei, & Knight, 1990).

The complex, and controversial, relationships that have been postulated between gay men and substance use are well documented (Chesney, Barrett & Stall, 1998; Woody, Donnell, Seage, Metzger, Marmor, & Koblin 1999) in history. For example, homosexuality has been deemed a *cause* of alcoholism (Israelstam & Lambert, 1983), however this view is not supported by data. More commonly, the hypothesis is held that the functions of substance use among this population are likely to help gay men to manage and cope with the specific issues they face (e.g., sexual identity, discrimination, fears of HIV; Cabaj, 2000; Ostrow, 1996). These issues are related to poor self-image, stress reduction and coping with issues of

sexual identity and minority stress (Hatzenbuehler, Corbin, & Fromme, 2008; McKirnan & Peterson, 1988; Kurtz, 2005; Myers, et al 1992; Rosario, Hunter, & Gwardz, 1997; Williams, 2003), however this is not supported in some Australian research (Prestage et al., 2007a). Less information or affiliation with the gay community and lower self-esteem are associated with increased substance use (Finnegan & Cook, 1984; Glaus, 1988, Meyer & Dean, 1995). Substance use is also considered normative among MSM (Semple, Patterson, & Grant, 2004; Hurley & Prestage, 2009) and has been found to be associated with *greater* gay community affiliation (Flores, Mansergh, Marks, Guzman, & Colfax, 2009). Further, a strong sense of community and social networks, conversely, can also serve to increase normative substance misuse (Darke et al., 1995; Prestage et al., 2007b).

Alcohol and other substance use have been historically embedded within specific contexts within gay subculture (Fergus et al., 2005; Greenwood et al., 2001; Lewis & Ross, 1995; Slavin, 2004c). Bars and night clubs have been some of the central places where gay men and lesbians have felt free to socialise together without fear of stigmatisation by wider society (Bell & Weinberg, 1978; Fergus et al., 2005; Stall & Purcell, 2000). Substance use has been paired with sexual behaviours or settings, resulting in state-dependent learning (Ostrow, 1996). Substance use has also been intimately linked with specific behaviours, such as attendance at dance parties (e.g., raves, circuit parties; Lee et al., 2003; Lewis & Ross, 1995; Ross et al., 2003) and use during sexual contact (Halkitis & Parsons, 2002; Semple, Patterson, & Grant; 2002). Sexual risk-taking and history of substance use among this group have also been linked with attendance at SOPV (Binson et al., 2001; Halkitis & Parsons, 2002; Mullens et al., 2009a). Further, MSM are likely to meet sexual partners in

places where substance use occurs (Fergus et al., 2005; Strueve, O'Donnell, Duran, Duvall, & Geier, 2002).

Certain drugs possess specific sexual meanings in the gay community [e.g., unprotected anal intercourse (UAI); Reback, 1997], and UAI can further reaffirm gay identity among some MSM (D'Augelli, 1998; Davies, Hickson, Weatherburn, & Hunt, 1993). Substance use is also associated with gay cultures (Prestage et al., 2007a), more sexually adventurous practices (Prestage et al., 2007b; Smith et al., 2004), and enhancing sexual experiences (Green & Halkitis, 2006). These normative influences can contribute to higher rates of use and misuse (Cabaj, 2000; Herdt, 1997; Knox et al., 1999). For example, amyl nitrite is used almost exclusively during sexual contact among gay and bisexual men or at dance parties to heighten sensation (French & Power, 1997; Lampinen et al., 2007; Prestage, 2009). Gorman and colleagues (1997) noted that gay and bisexual men perceive "intense associations between methamphetamine use and sexual behaviour" (p. 109), and amphetamine use is associated with barebacking (Halkitis et al., 2003). Among gay and bisexual men poly-drug use (use of more than one substance in combination or sequentially) is also common. For example, nitrites are used in association with other substances (e.g., ecstasy, amphetamines, LSD) to heighten the effects of other drugs or to prolong desired effects (French & Power, 1997). More recently, Viagra<sup>®</sup> has been used with other substances to heighten sexual experiences and to improve sexual functioning (Aldridge & Measham, 1999; Chu et al., 2003; Romanelli & Smith, 2004; Slavin, 2001).

Various studies from within Australia lend support for contextual associations between substance use and MSM (Darke et al., 1995; Knox et al., 1999; Slavin,

2004c). Darke and colleagues (1995) suggested that, among a sample of heterosexual and homosexual amphetamine using participants, substance use was intimately linked with social networks. In another study of non-prescription drug using gay men in three major Australian cities, researchers suggested that injecting drug use is embedded within a subculture of HIV-positive people; however, some participants reported use occurring outside of gay community contexts (Knox et al., 1999). The use of crystal methamphetamine among MSM in Australia is related to particular social (e.g., dance parties, with friends) and sexual contexts (Slavin, 2004c).

### **Substance Use and Sexual Risk-taking among MSM**

Historically and anecdotally, substance use has been linked with sexual risk-taking, both, among the general population and among MSM. Leigh and Stall (1993) believe, “Both sex and substance use are complicated behaviours, and determining the nature of the relationship between them is not simple” (p. 1041). There is substantial support in the research literature for the role of substance use in HIV risk behaviours among MSM at the global, situational and event levels (Cooper, 2002; Maisto et al., 2010). However, these relationships are complex (Halkitis et al., 2003; Kippax, Campbell, Van de Ven, Crawford, Prestage, & Knox, 1998; Parsons et al., 2004), and literature reviews have shown inconsistent findings (Lee & Stall, 1993; Schuper et al., 2009; Stall & Purcell, 2000; Woolf & Maisto, 2010). Substantial previous research has demonstrated a significant relationship across various sexual risk related outcomes (e.g., Frosch, Shoptaw, Huber, Rawson, & Ling, 1996; Mattison et al., 2001; Purcell, Moss, Remien, Woods, & Parsons, 2001; Klitzman et al., 2002), such as HIV sero-conversion (e.g., Carey et al., 2009; Greenwood et al.,

2001; Koblin, Husnik, Colfax, Huang, Madison, & Mayer, 2006; Prestage, 2009; Silvestre, Lyter, Valdiserri, Huggins, & Rinaldo, 1989; Wiebel, Jimenez, Johnson, Oullet, Jovanovic, & Lampinen, 1996), acquisition of sexually transmissible infections (e.g., Hirshfield, Remien, Humberstone, Walavalkar, & Chiasson, 2004), UAI (e.g., Morin, Steward, Charlesbois, Remien, Pinkerton, & Johnsons, 2005; Myers et al., 1992; Ross et al., 2003; Tawk, Simpson, & Mindel, 2004), and UAI while under the influence (e.g., Choi, Operario, Gregorich, McFarland, MacKellar, & Valleroy, 2005). However, other studies have not supported these findings (e.g., Bolton, Vincke, Mak, & Dennehy, 1992; Diaz, Morales, Bein, Dilan, & Rodriguez, 1999; Dudley et al., 2004; Folch, Marks, Esteve, Zaragoza, Munoz, & Casabona, 2006; Gillmore, Morrison, Leigh, Hoppe, Gaylord, & Rainey, 2002; Kippax et al., 1998; Myers et al., 1992; Weatherburn, Davies, Hickson, Hunt, McManus, & Coxon, 1993; , Wilson, Cook, McGaskey, Rowe, & Dennis, 2008).

Differences in findings could be attributed to methodological differences (e.g., how substance use and sexual risk-taking are defined or measured) and other variables, including personality and situational factors (e.g., negative mood state, desire to please sexual partner, sex feeling better without a condom, where sex took place; Adams & Neville, 2009; Dingle & Oei, 1997; Fisher et al., 2007; Gillmore et al., 2002; Gold, Skinner, Grant, & Plummer, 1991; Kelly, Kalichman, Kauth, Kilgore, Hood, & Campos, 1991; Kelly & Kalichman, 1998; Reisner, Mimiaga, Skeer, & Mayer, 2009; Smith et al., 2004; Wilson et al., 2008). A qualitative review of the above studies revealed that substance-related (e.g., higher level of intoxication, use of alcohol in conjunction with other drugs) and partner ('casual' versus 'regular', seroconcordant versus serodiscordant) characteristics were associated with significant findings, although not unanimous. This review did not appear to reveal

any *other* factor groupings (e.g., behavioural, demographics) that were assessed, which could potentially account for significant versus non-significant results.

Some of the potential causal mechanisms suggested to explain the relationships between sexual risk-taking and substance use at the situational level include pharmacological effects, behavioural disinhibition and biological interactions (Dingle & Oei, 1997; Ostrow, 1994; 1996; Woolf & Maisto, 2009). Pharmacological effects refer to enhanced sexual performance and sexual experiences and have been associated with *specific* substances, including alcohol (Critchlow, 1986; George & Stoner, 2000; Parsons, Vicioso, Punzalan, Halkitis, Kutnick, & Velasquez, 2004), amphetamines (Colfax & Shoptaw, 2005; Guss, 2002; Kurtz, 2005; Nanin & Parsons, 2006; Slavin, 2004c) and amyl nitrite (Carey et al., 2009; French & Power, 1997; Lange et al., 1988). Substance use can facilitate certain sexual practices that are perceived as desirable, such as prolonged sexual energy and engaging in more sexually adventurous or esoteric practices (Kippax et al., 1998). Guss (2002) illustrates this concept concerning stimulant use among MSM:

When sex is added to the stimulant experience, its meaning and value are heightened or transformed. If a sexual experience is combined with ... cocaine or crystal methamphetamine, powerful and reciprocally enhancing experiences occur. (p. 108)

Likewise, amyl nitrite is commonly used exclusively for enhancing sexual encounters (Lange et al., 1988). Disinhibition is also responsible for a variety of risk-taking consequences, including UAI (Cooper, 2002; Derman & Copper, 1994a;b; Derman, Cooper & Agocha, 1998; Kelly, St. Lawrence, & Brasfield, 1991; McKirnan & Peterson, 1992). Several biological interaction hypotheses exist regarding the role of substance use in sexual risk-taking and HIV transmission. For example, certain drugs (e.g., amyl nitrite, cocaine) relax anal sphincter muscles to

allow for prolonged or more painful intercourse to be tolerated, resulting in increased bleeding that can make HIV transmission more likely (Lampinen et al., 2007; Seage, Mayer, Horsburgh, Holmberg, Moon, & Lamb, 1992). Chronic substance use can also result in immunosuppression, which can increase the likelihood of sero-conversion among HIV-negative individuals (Dax, Adler, Nagel, Lange, & Jaffe, 1991; Samet et al., 2003).

There is substantial evidence to suggest a significant association between substance use and sexual risk-taking, which is likely to operate via a variety of direct and indirect mechanisms, and it is probably *a combination of factors* that influences the relationships between substance use and sexual risk-taking among MSM (Kalichman et al., 1998; 2002; Ostrow, 1996). According to Ostrow (1996), “The direct effects of drugs must be seen as a combination of their pharmacological properties, plus learned expectancies and stress-dampening effects” (p. 2). Some other key factors that deserve further attention are contexts of use, functional aspects of substance use, normative beliefs about substance use and stressors associated with gay identity that impact upon substance use (Leigh & Stall, 1993; Mullens et al., 2009b; Ostrow, 2000). Future research in this area must extend beyond the quantification of substance use and the social and medical problems that MSM experience in connection with substance use and focus on qualitative and quantitative approaches to help generate, test and refine additional theoretically driven hypotheses regarding the complex relationships between substance use and sexual risk-taking among this population. A particular focus on investigating other key psychological factors that underlie these associations (Bryant, 2006; Kurtz, 2005; Leigh & Stall, 1993; Woolf & Maisto, 2009) is also required. Using theories to

guide related research is also necessary to effectively translate research findings into HIV prevention tools for MSM communities (Ostrow, 2000).

### **Theories regarding the Relationships between Substance Use and Sexual Risk-taking among MSM**

Some of the strongest support in the research literature regarding MSM is indicated through event level studies, as this method has the advantage of being able to show a temporal link between substance use and sexual behaviour (Woolf & Maisto, 2009). However, inconsistencies in previous findings regarding the substance use and risky sex association are suggestive that other factors (e.g., substance related expectancies, sensation seeking personality characteristics) underlie or moderate substance use and sexual risk-taking or represent indirect causal mechanisms (Crawford et al., 2003; Kalichman et al., 1998; Schuper et al., 2009; Stall & Purcell, 2000). Theories have been investigated to explain the relationships between substance use and sexual risk-taking among the general population (Dingle & Oei, 1997) include self-handicapping theory (e.g., Berglas & Iones, 1978; Tucker, Vuchinich, & Sobell, 1981), tension reduction theory (e.g., Stoner, 2004; Wells & Kline, 1987; Young et al., 1990), risk-taking personality characteristics (e.g., Seal & Agostinelli, 1994; Temple, Leigh, & Schafer, 1993), SCT (including expectancy theory; e.g., LaBrie et al., 2006) and alcohol 'myopia' theory (i.e., focussing on short-term motivation over long-term consequences; e.g., George & Stoner, 2000; Steele & Josephs, 1990). However, in comparison, relatively little is known regarding theoretically driven models specific to explaining UAI among MSM (Woolf & Maisto, 2009).

Limited previous research among MSM has been theoretically driven and has included a *specific* framework to explore the factors that underlie relationships between sexual risk-taking and HIV exposure among MSM (Woolf & Maisto, 2009). The proposed theories that have received limited investigation, to date, among MSM include alcohol ‘myopia’ theory (Steele & Josephs, 1990; Vanable et al., 2004), substance-related expectancies (Bimbi et al., 2006; Parsons & Bimbi, 2007; Woolf & Maisto, 2009) and cognitive escape theory (McKirnan et al., 1996; 2001). Sensation seeking personality characteristics have also been suggested to underlie both substance use and sexual risk-taking (Crawford et al., 2003; Dolezal et al., 1997; Dudley et al., 2004; Kalichman et al., 1996; 1998). Each of these theories implies a functional or strategic use of substances.

Alcohol ‘myopia’ theory suggests that alcohol use heightens shorter-term motives, such as sexual arousal, versus longer-term implications of behaviour including HIV transmission (Steele & Josephs, 1990). Expectancies refer to an individual’s beliefs about the consequences or effects of a given action (e.g., substance use), which are related to personal experiences, vicarious experiences or an acquired concept about appropriate behaviour (Weinhardt et al., 2002). Cognitive distancing or disengagement strategies have been developed specifically for MSM and suggest that substance use helps the individual “escape” from fears about HIV and results in reduced motivation to practice safer-sex norms regarding behaviour (Crawford et al., 2003; McKirnan et al., 1996; 2001; Ostrow, 1996). Cognitive escape theory incorporates aspects of both alcohol ‘myopia’ theory and expectancy theory (McKirnan et al., 2001). Further, referred to as “desire for excitement” (Gold et al., 1991), novelty-seeking or sensation seeking refers to a personality disposition defined as a tendency to prefer risk-taking, exciting, optimal and novel stimulation or

arousal (Kalichman, Johnson, Adair, Rompa, Multhauf, & Kelly, 1994). The two theories which will be investigated in the current study are substance related expectancies and novelty-seeking personality characteristics. These approaches demonstrate the strongest theoretical and evidence base (e.g., Bimbi et al., 2004; LaBrie et al., 2006; Kalichman et al., 1998; 2002), and these factors are likely to operate together to influence consequences post substance use (Bandura, 1986; Bittner, 1997; Jerome, Halkitis, & Siconolfi, 2009; Leventhal & Schmitz, 2006; Myers et al., 2004; Ostrow, 1996; Semple, Patterson, & Grant, 2000).

### **Substance-related expectancies.**

It is well known that expectations about the effects of a given substance and the context in which people learn how to use a drug are likely to significantly impact upon post-use behaviour (Ostrow, 1996). This has been consistently demonstrated among the general population and specific groups (e.g., adolescents, college students; e.g., Derman et al., 1998; LaBrie et al., 2002; Weinhardt & Carey, 2000). Individuals who believe that substance use will result in particular consequences (e.g., heightened arousal, increased sexual adventurousness) are more likely to have these consequences occur, which could in turn make sexual risk-taking more likely. For example, LaBrie and colleagues (2002) found that college students who believed that alcohol use negatively influenced upon condom use were both more likely to use greater amounts of alcohol and were less likely to use condoms. Previous research among the general population and specific groups (e.g., mental health patients) has also demonstrated an association of substance-related expectancies with substance use (e.g., Aarons, Goldman, Greenbaum, & Covert 2003; Green, Kavanagh, & Young, 2003; Hull & Young, 1983; Oei & Young, 1987; Young & Oei, 1993), which

is also likely to be relevant among MSM and warrants further research to inform prevention and intervention efforts (Maisto et al., 2010; Parsons & Bimbi, 2007).

Studies specifically investigating relationships between substance-related outcome expectancies and HIV risk behaviour outcomes among MSM are rare (e.g., Bimbi et al., 2004; Halkitis et al., 2007; Kalichman et al., 1998; McKirnan et al., 2001). McKirnan and colleagues (1996) have proposed a model of “cognitive escape”. Cognitive escape theory has been developed specifically for MSM and includes, both, “coping fatigue” regarding safer sexual practices and expectancies that substance use enhances sexual experiences and reduces anxiety. Among a sample of 281 gay or bisexual men in the Chicago area, MSM who were frequent drug users (versus those who only used alcohol or were infrequent drug users) reported greater expectancies that substance use facilitated sex or cognitive escape, were more likely to use drugs in conjunction with sex. They were also more likely to report unprotected *receptive* anal intercourse. McKirnan et al. (2001) used a 12-item, single factor, measure of alcohol and other drug expectancy measure (based on *a priori* previous research, e.g., Derman & Cooper, 1994a; Gold et al., 1991; McKirnan & Peterson, 1988), that included items such as “After getting drunk or high I am more sexually responsive”. Bimbi and colleagues (2004) found that greater expectancies for sexual risk were associated with UAI (insertive or receptive), overall, and among HIV-positive (versus HIV-negative) participants and employed a four-item, single factor, measure of substance related expectancies (based on qualitative research by Parsons et al., 2004). The measure amalgamated data from multiple substance type and was developed *a priori* (e.g., “I am more likely to engage in unprotected anal insertive sex while drinking/high”). In both studies, findings are limited as expectancy scales lacked methodological rigor in their

development. Robust psychometric properties were not known. Expectancy items were amalgamated across multiple substance types, which limits its utility as some substances may be more strongly linked with UAI than others (McKirnan et al., 2001) and expectancies are likely to vary by substance type (Leventhal & Schmitz, 2006). Further, perceived reinforcement solely focused on sexual outcomes (versus a combination of sexual and non-sexual), limits understanding of the social and emotional facilitation) aspects of risk (see Mullens et al., 2009b; 2010; 2011; *in press*).

Support for the potential role of expectancies in sexual behaviours among MSM has been demonstrated by Parsons and Bimbi (2007) who explored factors that distinguished barebackers from other MSM. Utilising an eight-item measure of sexual outcomes (again based on work by Parsons et al., 2004), it was found that HIV-positive (versus HIV-negative) barebackers reported greater expectancies regarding sexual consequences secondary to use. In addition, consistent with expectancy research among the general population, findings have recently demonstrated that substance related expectancies are also associated with greater substance consumption patterns among MSM (Halkitis et al., 2007; McKirnan & Peterson, 1988; Mullens et al., 2010; 2011; *in press*; Nakamura et al., 2009) and lesbian and gay youth (Hatzenbuehler et al., 2008).

Attempts to extend research regarding the role of expectancies in understanding the links between substance use and sexual risk-taking have been hampered by a lack of expectancy measures specifically developed for MSM that are comprehensive, methodologically sound, psychometrically robust, relevant and culturally appropriate (Bimbi et al., 2004; Mullens et al., 2010; Peele, 1997). Recent

contributions have included the development of the Substance Expectancy Profile for Men who have Sex with Men (SEP-MSM) for alcohol, amyl nitrite, cannabis and stimulant expectancies (see Mullens et al., 2010; 2011; *in press*). The SEP-MSM represents a comprehensive range of sexual (e.g., enhanced sexual experiences, sexual negotiation) and non-sexual (e.g., social and emotional facilitation, cognitive impairment) expected reinforcing aspects of use across the *range* of commonly used substances. Further, each measure was uniquely and specifically developed for the corresponding substance type (see Mullens et al., 2009b; 2010), which represent an important advance.

**Table 1: Factors comprising the four expectancy measures of the SEP-MSM**

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**CEQ-MSM**

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1. Enhanced sexual experience
  2. Sexual negotiation
  3. Cognitive impairment
  4. Social and emotional facilitation
  5. Enhanced sexual desire
  6. Sexual disinhibition
- 

**DEQ-MSM**

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1. Cognitive impairment
  2. Sexual activity
  3. Social and emotional facilitation
- 

**AEQ-MSM**

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1. Enhanced sexual desire
  2. Disorientation
  3. Sexual negotiation
- 

**SEQ-MSM**

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1. Enhanced sexual desire
  2. Sexual negotiation
  3. Cognitive and social facilitation
  4. Sexual activity
-

Only one other known related questionnaire has been empirically developed specifically for among MSM pertains to outcome expectancies for crystal methamphetamine use (Halkitis et al., 2007). It consisted of a 15-item, two factor (“positive” and “negative”) questionnaire that was based on previous work by the authors (see Halkitis & Shrem, 2006) and was associated with drug consumption. While it assessed both sexual and non-sexual outcomes, it did not specifically assess perceived reinforcement regarding sexual negotiation or risk-taking.

Another related measure has been identified in relation to reasons for *initiating* crystal methamphetamine (Nakamura et al., 2009), developed for gay and bisexual HIV-positive men, and included 16-items and four factors: 1) “to party”; 2) “to cope”; 3) “for energy”; and 4) “to improve self-esteem”) that focused on both sexual and non-sexual consequences. The measure developed by Nakamura and colleagues (2009) is also likely to uniquely contribute to the research literature as it is empirically derived, developed specifically for use among MSM, is psychometrically sound and focuses on a specific stimulant type that is related to sexual risk—however the focus on *initiation* of crystal methamphetamine use (versus reasons for *current or ongoing* use) has less relevancy to understanding current substance use patterns and sexual risk practices. Previous research has indicated that expectancies differ based on HIV-status (Bimbi et al., 2004), and therefore results may not be generalisable to a wider group of MSM—particularly the majority who are HIV-negative.

One further recent approach to measuring expectancies in this population has included an eight-item, single factor, alcohol expectancy measure that was initially developed for the general population by Leigh (1990) which has been recently

refined for use among HIV-positive and HIV-negative men (Maisto et al., 2010). However, this measure was not specifically developed for MSM and is likely to lack cultural relevancy (Bittner, 1997; Kalichman et al., 1998; Mullens et al., 2010; Peele, 1997; Young & Knight, 1989). It also focuses solely on sexual outcomes and does not explore beliefs associated with other substance types. It is unknown what proportion of these participants were MSM, which further limits the generalisability of these findings, particularly as these data were obtained in the United States where those living with HIV are not typically comprised primarily of MSM (CDCP, 2007).

### **Risk-taking personality characteristics.**

Among the general population, individuals with risk-taking personality features are at increased likelihood of engaging in a variety of risk-taking, activities including UAI (e.g., Norris, Stoner, Hessler, Zawacki Davis, & George, 2009; Seal & Agostinelli, 1994). These findings have been replicated among MSM (e.g., Crawford et al., 2003; Dolezal et al., 1997; Dudley et al., 1997; Kalichman et al., 1996; Ross et al., 2003). For example, Kalichman and colleagues (1996) demonstrated that sensation seeking characteristics predicted UAI over and above alcohol or other drug use before sex in a sample of 99 MSM in the United States. These findings may be limited due to the measures of sensation seeking employed (e.g., Kalichman et al., 1994 based on Zuckerman Kolin, Price, & Zoob, 1964), which lack the theoretical or biological rigor of *other* means of assessing risk-taking personality characteristics [e.g., Temperament and Character Inventory Novelty Seeking (TCI-125 NS) scale; Cloninger, 1994; Cloninger et al., 1993; 1994; Deditius-Island et al., 2002; Ono et al., 2002]. Further, specific risk-taking measures (e.g., sexual sensation seeking; Kalichman et al., 1994) are not likely to sufficiently

capture general impulsivity qualities related to both substance use and sexual behaviour. In addition, risk-taking personality features tend to be more resistant to intervention and change than other factors (e.g., expectancies) that contribute to sexual risk-taking among substance using MSM (Dolezal et al., 1997; Goldman, 1994), and expectancies provide a more suitable approach to intervention efforts (Kalichman et al., 2002).

### **Substance related expectancies and risk-taking personality characteristics.**

The relative contributions of *both* expectancies and sensation seeking on sexual behaviour have been examined among the general population and specific groups (e.g., college students; see Brown and Vanable, 2007; Bryant, 2006; Hendershot, Stoner, George, & Norris, 2007; Kalichman, Simbayi, Jooste, Vermaak, & Cain, 2008). Such studies among MSM are rare (Kalichman et al., 1998). Only one known study, to date, has explored the moderating contributions of substance related expectancies *and* sensation seeking personality characteristics on sexual risk-taking. Kalichman and colleagues (1998) found that sensation seeking predicted sexual risk behaviour (e.g., number of sexual partners) over and above substance use prior to sex. Further, path analyses revealed sensation seeking was related to expectancies, which were in turn related to substance use in conjunction with sex and UAI. Subsequent research has reported similar findings among a cohort of HIV-infected men (Kalichman et al., 2002). The research methodology in Kalichman et al. (2002) focused on the *number* of sexual partners as a measure of sexual risk (which is not likely to be as accurate an indicator of likelihood of HIV transmission as other behaviours such as UAI, and may be correlated with seeking novel sexual situations or partners).

### **Aims of the Research**

This program of research, comprising a PhD thesis, examined a set of demographic and psychological factors related to sexual risk-taking among MSM, with a specific emphasis on factors that help to better understand the relationships between substance use and sexual risk-taking among this population, including substance related outcome expectancies and sensation seeking personality characteristics. There is an association between substance use and sexual risk-taking, which are likely to operate via a variety of direct and indirect mechanisms. Several models, hypotheses and modes of investigation have been used to explore these relationships. It is most likely that a *combination* of factors influences the relationships between substance use and sexual risk-taking among MSM (Kurtz, 2005). Researchers in this area suggest that the effects of a given substance are the result of a combination of factors, including pharmacological aspects, learned expectancies, stress-dampening effects and contexts of use (Myers et al., 2004; Ostrow, 1996). Future research in this area must extend beyond the quantification of substance use and the social and medical problems that MSM experience in connection with substance use and focus on qualitative approaches to generate additional hypotheses regarding the complex relationships between substance use and sexual risk-taking among this population (Leigh & Stall, 1993; Mullens et al., 2009b; 2010; Parsons et al., 2004), and further quantitative research to test and substantiate these hypotheses.

The multifaceted nature of substance use and sexual risk-taking among MSM requires the integration of demographic and psychological factors (e.g., substance use, sexual risk-taking, substance-related expectancies) in order for a comprehensive

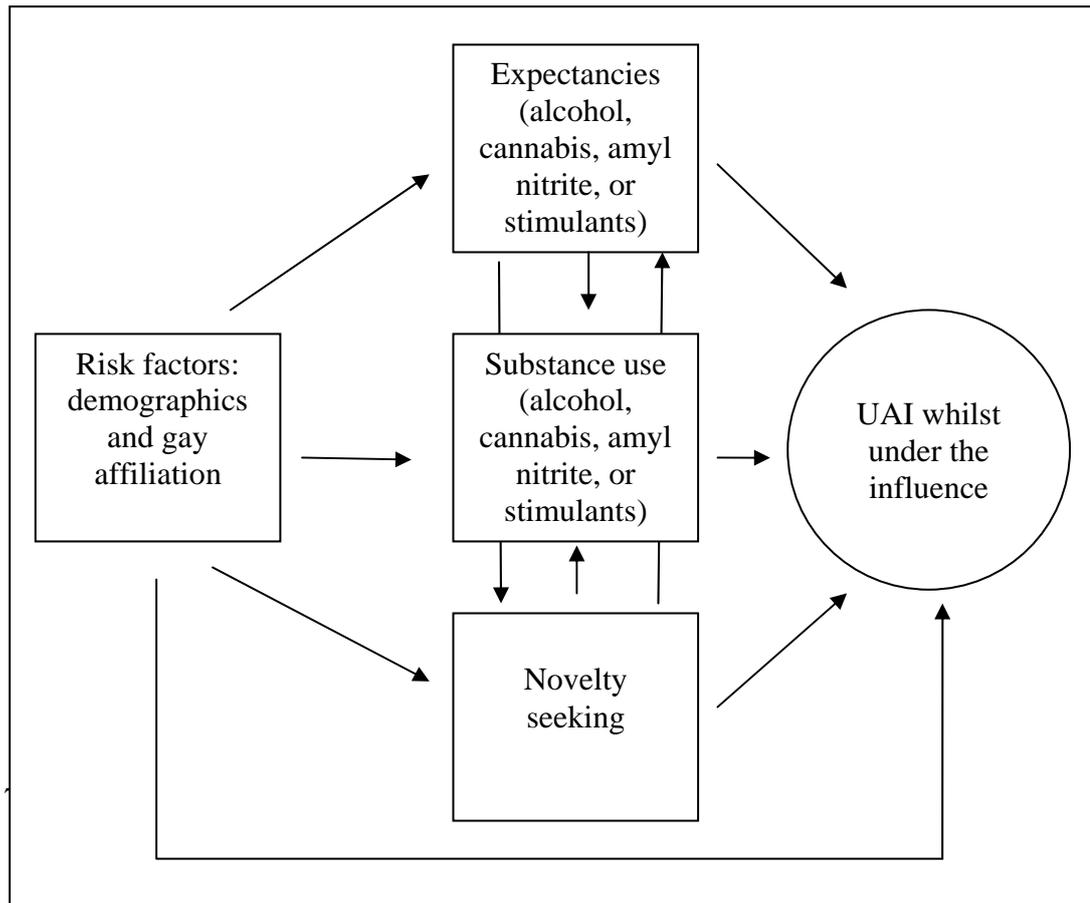
model based on SCT to be developed (Maisto et al., 2010; Ostrow, 2000; Schuper et al., 2009; Woolf & Maisto, 2009). There is significant support in the literature regarding the construct of expectancy related to substance use and sexual risk-taking, which is consistent with contextual issues experienced by MSM. The ways in which substances are used among MSM and the specific reinforcing aspects of use are distinct from other groups and carry heightened risks. Therefore, measures of expectancy among MSM must be relevant and accurately reflect the distinct issues faced by this population.

Thus, the areas of particular interest to the current research program have: 1) Examined the nature of cognitions that represent the reinforcing consequences of substance use relevant to sexual risk-taking among MSM; and 2) Moved beyond descriptions of the relationships between substance use and sexual risk-taking, and built upon existing SCT, in order to develop relevant tools. The following series of investigations commenced with an investigation of the perceived consequences of substance use on the experiences of MSM and the role of expectancies in subsequent sexual behaviours. These data informed the development of new psychological measures of substance related expectancies for use with MSM and subsequent quantitative research to further refine this measure and better understand factors that are predictive of UAI among MSM. The aims of this research included:

- Examining how MSM perceive the effects of substance use on their thoughts, feelings and behaviours, including sexual behaviours. This information was attained via qualitative pilot group and interviewing processes in Study 1 and resulted in the establishment of key themes related to this topic, as well as the generation of items, that were incorporated into substance-related alcohol and

drug expectancy measures (Study 2). Results from Study 1 helped to inform the development of a multidimensional model incorporating substance use and sexual risk-taking that was tested in Study 3.

- Developing a measure of MSM relevant expectancies regarding substance use (e.g., alcohol, cannabis, inhalants and stimulants) among MSM that possessed sound psychometric properties and was culturally appropriate for use among this group. The measure that was developed included expectancy items extracted from interview transcripts (Study 1) that were incorporated into Study 3.
- Measuring the prevalence of sexual risk-taking behaviours, substance use, alcohol and drug expectancies and demographic factors (e.g., age, ethnicity, affiliation with the gay community, relationship status, living in metropolitan or regional or rural areas, education level, employment status) among MSM throughout Australia. These data were collected in order to better understand the relationships between substance use and sexual risk-taking and other contributing or mediating psychological and demographic factors (Study 3), and were used to test a predictive model. Based on SCT and previous research it was hypothesised that substance use, expectancies and novelty-seeking personality characteristics (as influenced by risk factors) provided unique contributions in discriminating those who do or do not report UAI in conjunction with substance use (see Figure 1). Further, it was anticipated that the relative predictive patterns of factors would vary across substance types.



**Figure 1: Predictive model testing the contributions of substance use, expectancies and novelty seeking on UAI in conjunction with substance use**

### Significance of the Research

Based on SCT and previous research among the general population and MSM it is hypothesised that substance use, expectancies and novelty-seeking personality characteristics will provide unique contributions in discriminating those who report UAI in conjunction with substance use from those who do not, and the relative predictive patterns of contributing factors of interest are likely to vary across substance types, given their varied pharmacological properties and contexts of use.

It is anticipated that information gained from this program of research will facilitate understanding of the domain of expected effects across a range of specific

substances used among MSM, and the extent to which UAI) implicated in HIV transmission. Identifying and modifying factors that contribute to substance use and associations with sexual risk-taking could significantly reduce UAI and subsequent HIV transmission (Schuper et al., 2009). Examination of expectancies common to psychoactive substances could be useful targets for matters of intervention and practice. More specifically, some of the applications of the expectancy measures to be developed and associated research findings could include:

- identifying MSM with risk factors who are using substances problematically and engaging in sexual risk-taking based on their beliefs or expectancies regarding substance use and providing preventative education;
- tailoring treatment of substance use issues among MSM by incorporating cognitive therapy to challenge unhelpful beliefs about their substance use and/or establishing alternatives to substance use which serve similar functions but in a less harmful manner;
- gaining a better understanding of broader psychosocial needs related to changing substance use patterns among this group and impediments to changing substance-related behaviours to better meet the needs of MSM communities; and
- incorporating commonly held beliefs among MSM about the effects of substance use into broadscale HIV prevention and health promotion efforts in order to develop more relevant and effective campaigns.

### **Chapter 3: Phase 1—Qualitative Study, the Consequences of Substance Use among Gay and Bisexual Men: A Consensual Qualitative Research Analysis**

#### **Purpose of the Study**

Substance use is common among gay and bisexual men and is associated with significant health risks (e.g., HIV transmission). The consequences of substance use across the range of commonly used substances have received little attention. The purpose of this study was to map participant's beliefs about the positive and negative effects of their substance use, to inform future prevention, health promotion and clinical interventions regarding substance use and associated harm. Participants were interviewed about personal experiences regarding the consequences of substance use, and recruited through medical and sexual health clinics. Data were collected through a small group discussion and one-to-one interviews. Participants' responses regarding the perceived consequences of their personal substance use will be coded using Consensual Qualitative Research (CQR) methodology. It was anticipated that use of the CQR process would result in the identification of a comprehensive range of themes subsequent to substance use. Findings from this study may assist in developing appropriate prevention and interventions, and assisting in developing expectancy research among MSM.

#### **Introduction**

Epidemiological studies within Australia indicate significantly higher rates of substance abuse among MSM than within the general population (AIHW, 2007; Pitts et al., 2006). Poly-substance use and drugs such as amyl nitrite, amphetamines, ecstasy and cannabis are more popular among MSM (AIHW, 2007; Frankland et al.,

2007; Hull et al., 2005; Pitts et al., 2006). Gay men and other MSM experience unique challenges regarding discrimination, rejection and stigma (Diaz et al., 2004; Diaz, Heckert, & Sanchez, 2005; Herdt, 2007), which may predispose or increase risk of mental health difficulties, including substance misuse (Pitts et al., 2006; Frankland et al., 2007). Substance use is associated with attempts to reduce stress and cope with sexual identity (Cabaj, 2000; Myers et al., 1992); however, this is not supported in some Australian research (Prestage et al., 2007a). Less gay community affiliation and lower self-esteem have been associated with increased substance use (Meyer & Dean, 1995), however, substance use is also considered normative among MSM and is associated with gay party cultures (Prestage et al., 2007a), more sexually adventurous practices (Prestage et al., 2007b; Smith et al., 2004) and enhancing sexual experiences (Green & Halkitis, 2006), and can contribute to misuse (Cabaj, 2000; Herdt, 1997; Knox et al., 1999).

Substance use is linked with socio-cultural aspects of gay life (Slavin, 2004c), such as ecstasy, and crystal methamphetamine use at dance parties (Mattison et al., 2001) and saunas (Binson et al., 2001), and may serve to maintain a sense of community among peers (Stall & Purcell, 2000). A strong sense of community and social networks, conversely, can also serve to increase normative substance misuse (Cabaj, 2000; Herdt, 1997; Darke et al., 1995). Substance use also enhances sexual experiences (George & Stoner, 2000) and is associated with specific sexual practices, such as amphetamine use and barebacking (Gauthier & Forsyth, 1999; Halkitis et al., 2003; Ostrow, 2000). Substance use is a salient risk factor for UAI among MSM (Colfax, Vittinghoff, Husnik, McKirnan, Buchbinder, & Koblin, 2004; Hirschfield et al., 2004; Parsons, Kutnick, Halkitis, Punzalal, & Carbonari, 2005), although other studies have not supported these relationships (Diaz et al., 1999; Folch et al., 2006;

Gillmore et al., 2002; Weatherburn et al., 1992; Wilson et al., 2008). The majority of research has focused primarily on alcohol use; however, more recent studies have also demonstrated positive associations between sexual risk-taking and use of other substance types, such as crystal methamphetamine and amyl nitrite (e.g., Carey et al., 2009; Lampinen et al., 2007; Parsons & Bimbi, 2007; Nanin & Parsons, 2006). Various underlying or mediating theoretical frameworks (e.g., cognitive escape theory, sensation seeking; Crawford et al., 2003; Kalichman et al., 1996; 1998; McKirnan et al., 1996) have been posited. Others have explored the role of substances to cope with unique stressors associated with being gay, such as discrimination (Diaz et al., 2004; 2005).

Little is known about how MSM perceive the consequences of their substance use. Qualitative studies that explore a broad range of consequences of substance use and consider multiple substances in the same study have not been evident to date. Myers and colleagues (2004) conducted in-depth interviews with drug using MSM regarding sexual outcomes associated with substance use. However, this study did not explore broader (e.g., non-sexual) consequences of substance use. Another study investigated alcohol expectancies regarding condom use among college students, however these results are unlikely to be generalised to MSM and responses were based on three pre-determined items regarding sexual consequences of use (LaBrie et al., 2002). Bimbi and colleagues (2006) incorporated a brief measure of outcome expectancies into a quantitative study involving a large cohort of gay and bisexual men; however, these questions were limited to four items developed a priori.

Thus, there was a need to advance previous research using a phenomenological approach to understand the direct experiences of the consequences of substance use

among MSM, encompassing a broader range of psychosocial contexts of substance use. Clear recommendations based on literature reviews emphasise the need to explore the *subjective* nature of substance use among MSM based on their lived experience (Parsons et al., 2004; Ostrow, 2000), and use in-depth qualitative interviews to achieve this (Bimbi et al., 2006; Darke et al., 1995). In addition, much of the research in this area has focused on one or two substances (Diaz et al., 2005; McElrath, 2005; Palamar & Halkitis, 2004; Schluder, Lampinen, Miller, & Hogg, 2005; Myers et al., 2004). Individual drugs are important, however further investigations are needed regarding the range of commonly used substances among MSM and the effects of substances used in combination (Drumright et al., 2006). CQR (Hill, Thompson, & Williams, 1997; Hill, Knox, Thompson, Hess, & Ladany, 2005) is a robust methodology, selected to enhance understanding of the consequences of substance use among MSM. Thus, the primary aim of this study is to map participant's beliefs about the positive and negative effects of their substance use. Further research in this area is fundamental to developing suitable prevention, health promotion and clinical interventions regarding substance use and the associated harm (e.g., sexual risk-taking).

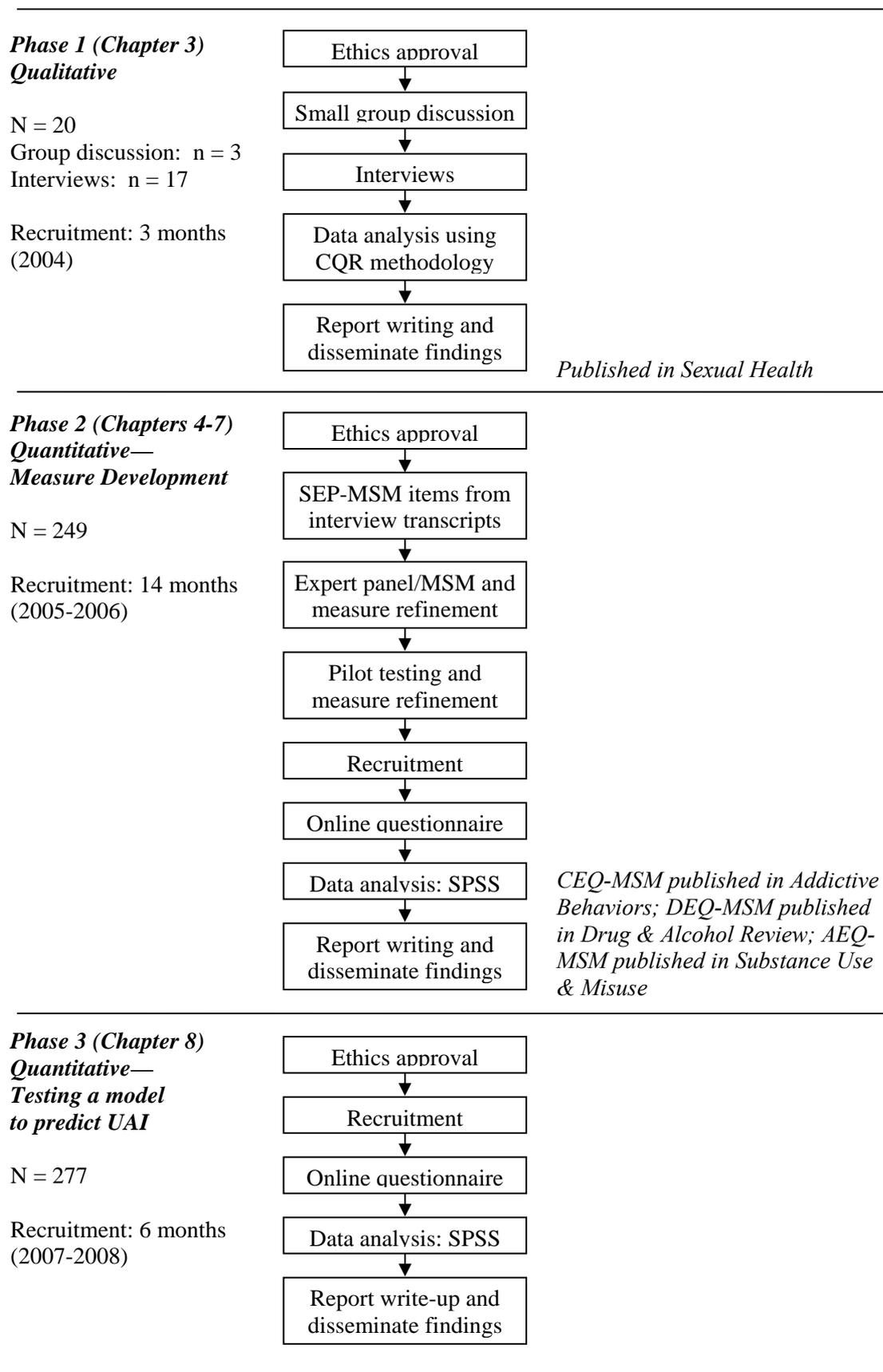
## **Method**

CQR incorporates phenomenological (Giorgi, 1985) and grounded theory (Strauss & Corbin, 1998) perspectives and "... aims to faithfully represent how participants describe their experiences rather than communicate how we as researchers experience the world ... and seek to minimise the idiosyncratic impact of the interviewers by using consistent interview protocols" (p 197; Hill et al., 2005). CQR uses standard protocols to explore how people construct their reality (i.e.,

socially constructed versions of ‘the truth’), and aims to minimise researcher bias.

CQR consists of: (a) open-ended questions in semi-structured data collection techniques (typically in interviews), which allow for the collection of consistent data across individuals as well as a more in-depth examination of individual experiences; (b) several judges throughout the data analysis process to foster multiple perspectives; (c) consensus to arrive at judgments about the meaning of the data; (d) at least one auditor to check the work of the primary team of judges and minimise the effects of ‘group-think’ in the primary team; and (e) domains, core ideas, and cross-analyses in the data analysis (Hill et al., 2005).

CQR was selected over other, similar and viable qualitative methodologies (e.g., grounded theory, ethnography), as this methodology draws upon multiple rich traditions, encompasses a broad theoretical framework and has demonstrated significant legitimacy within contemporary clinical health research (Ponterotto & Grieger, 2007; Rostosky, Riggle, Dudley, & Wright, 2006; Strauss & Corbin, 1998; Yeh & Inman, 2007). CQR possesses several distinct advantages. According to Hill and colleagues, the CQR approach “...is ideal for conducting in-depth studies of inner experiences of individuals...studying events that are hidden from public view...occur at varying time periods, have not been studied previously, or for which no measures have been created (p. 204; Hill et al., 2005)—all of which apply regarding studying the consequences of substance use among MSM. This methodology also incorporates clinical wisdom, helps to develop clinical competency, and relies upon a consensus approach among judges to develop and extract greater meaning from the data (Hill et al., 2005; Ponterotto & Grieger, 2007; Silverstein, Auerbach, & Levant, 2006; Yeh & Inman, 2007).



**Figure 2: Methodology of the program of research**

## **Sample**

### **Interviewees.**

Typically, CQR recommends utilising sample sizes of 8-15 participants (Hill et al., 1997), which allows for in-depth interviews. A search of 15 studies published from 2005-2007 using CQR revealed sample sizes of 10-36 (Jacob & Veach, 2005; Rostosky et al., 2006) and a literature review by Hill and colleagues (Hill et al., 2005) of studies using CQR prior to 2005 indicated samples sizes ranging from seven to 19.

A small group of self-identified gay men (health service users; n = 3) discussed perceived effects of substance use. These data informed semi-structured interviews with 17 self-identified gay and bisexual men until saturation in responses was attained (i.e., no novel or unique ideas emerged after the 15<sup>th</sup> interview; after reviewing content from the 16<sup>th</sup> and 17<sup>th</sup> interviews the research team was satisfied that a comprehensive listing of responses had been identified regarding the topic of interest). There was no overlap among small group discussion and interview participants.

### **Judges and interviewer.**

The research team included the PhD candidate and principal supervisor. The PhD candidate conducted all interviews and the research team developed and revised the data analysis system. The PhD candidate (a clinical/health psychologist working in sexual health) and a male psychologist with experience in gay health issues facilitated the small group discussion and the PhD candidate administered the

interviews. Auditing of the assignment of domains and categories to the data was conducted by the research team and an experienced qualitative researcher.

### **Procedure and Measures**

Participants were recruited through brochures in gay and lesbian medical practices and a community sexual health clinic in Brisbane over a three-month period. Advertising materials targeted self-identified gay and bisexual men regarding their experiences with alcohol or other drugs and included:

We want your input so that we can plan for better health services for MSM. Tell us about your experiences (good and bad) with alcohol, marijuana, amyl and/or speed. You will be paid \$20 to attend a brief interview or small group discussion. Your involvement is completely confidential and your responses are anonymous.

Approval was granted by the Human Research Ethics Committees at The Prince Charles Health Service District and Queensland University of Technology. Informed written consent was obtained.

Inclusion criteria were broad and included being over 18 years old, self-identifying as gay or bisexual and having prior experience with alcohol and/or other drugs. Consistent with CQR sample composition guidelines, participants were recruited from a specific population (e.g., gay or bisexual men) who were knowledgeable (e.g., having had recent experience) about the phenomenon under investigation (e.g., experiences with alcohol and/or other drugs; Hill et al., 1997; 2005). The first three respondents were allocated to the small group discussion and subsequent respondents were allocated to interviews. The small group discussion protocol was broad and aimed to avoid making prior assumptions about why MSM use drugs, to enable the data to accurately reflect the lived experience of MSM. Broad topic areas were consistent with both social-cognitive and personality

theoretical frameworks and were based on previous research (see Young & Knight, 1989).

### **Small Group Discussion**

The small group discussion was conducted at a community health centre. A semi-structured interview took two hours to complete. Questions asked during the discussion group were intentionally general (to reduce bias), and asked participants about their experiences, both positive and negative, with substance use (e.g., “What do you enjoy/not enjoy about using alcohol and/or other drugs”) and then focused on a discussion of a range of perceived effects of substance use.

### **Interviews**

Interviews were conducted one-to-one in person, with the exception of one participant interviewed by phone due to medical reasons. Interviews were held at a community health centre, using a semi-structured interview (15 to 45 minutes). Specific topics (e.g., emotional effects, sexual effects) during the small group discussion that gave rise to more specific and detailed questions utilised during interviews (e.g., “How does using cannabis effect your emotions or mood?”, “How does using cannabis influence your interactions with others?”, “How does using cannabis affect how you think and your ability to think clearly?”, “How does using cannabis affect what sort or what types of sex you get involved in?”, “How does using cannabis influence your ability to make decisions about sex?”; see Young & Knight, 1989). A standard proforma was used for all interviews (see Appendix K), and participants were asked follow up questions as relevant to allow for further development and understanding of their responses, as well as eliciting specific

examples. All participants were asked the same questions. Each set of questions was asked in reference to each substance type, before moving on to same set of questions for the next substance type. The order was randomly determined in advance. Participants only answered questions regarding substances they had direct experience using.

### **Method of analysis**

The small group discussion and interviews were audio-taped and transcribed verbatim. A sample of transcripts was reviewed by the research team for accuracy. A small proportion of responses were related to general effects of any substance use, rather than effects *specific* to the four drug classes investigated, and were excluded from further analyses. Consistent with CQR methodology, the following steps were followed: 1) Responses to open-ended questions were divided into topic areas; 2) Summaries were developed for all topic areas for each participant's data; and 3) A cross-analytic technique was used to develop categories to describe consistencies between the summaries and topic areas for each participant's data. An auditor confirmed the data extraction, and the findings were reviewed by two gay or bisexual men for consistency.

## **Results**

### **Sample characteristics.**

***Demographics.*** Twenty-one responses were received from advertisements, resulting in 20 participants. The mean age was 35 years (range: 18 to 50). Seventeen participants identified as "gay/homosexual" and three identified as

“bisexual”. Eleven were single and nine were in a same-sex relationship. Fourteen participants were employed, five received a pension/benefit and one was unemployed. Participants had a reported a mean of 14 years (range: seven to 19) formal education.

### *Substance use.*

*Past three months.* Sixteen participants reported alcohol use, 16 used cannabis, 12 used tobacco, eight used amyl nitrite, eight used amphetamines, four used ecstasy, four used prescription medication use for recreational purposes (e.g., OxyContin<sup>®</sup>), three used heroin, three used ketamine, and two used “other” drugs (e.g., barbiturates). No participants reported using cocaine or LSD in the previous three months.

*Lifetime use.* All participants reported using alcohol and most reported using cannabis (n = 19), amphetamines (n = 18), tobacco (n = 18), ecstasy (n = 17), amyl nitrite (n = 16), and LSD (n = 14). Approximately half reported cocaine use (n = 11), and prescription medications for recreational purposes (n = 10). Less than half reported lifetime use of heroin (n = 7), ketamine (n = 6), and “other” drugs (n = 7) (e.g., ethyl chloride, nitrous oxide, DMT, mescaline, psilocybin).

## **Main Findings**

Data from the small group discussion and interviews were classified into 13 domains and 28 categories (displayed in Table 2). Responses could be allocated into multiple domains, consistent with CQR.

**Table 2: Results of qualitative analysis of gay/bisexual men's beliefs regarding consequences of substance use**

<b>Domains</b>	<b>Categories<sup>a</sup></b>	<b>Label</b>
1. Altered cognitive functioning	<i>Global impairment</i>	<i>Typical</i>
	<i>Impaired decision making</i>	<i>Typical</i>
	<i>Reduced cognitive/emotional burden</i>	<i>Typical</i>
	Increased clarity/awareness	Variant
	Paranoia	Variant
2. Altered mood state	<i>Improves/enhances mood</i>	<i>Typical</i>
	Adversely effects mood	Variant
	Accentuates pre-existing mood state	Variant
3. Impact on social interactions	<i>Facilitates interaction with others</i>	<i>Typical</i>
	<i>Increases personal confidence/sociability</i>	<i>Typical</i>
	<i>Decreases capacity for social interaction</i>	<i>Typical</i>
4. Effects on the body	<i>Feel sick or unpleasant</i>	<i>Typical</i>
	<i>Sex more physically enjoyable/enhanced</i>	<i>Typical</i>
5. Impact on sexual activity	<i>Sexual performance</i>	<i>Typical</i>
	Impaired sexual performance	Variant
	Improved sexual performance	
	Engaging in sexual activity	Variant
	More sexual activity	Variant
	<i>Less sexual activity</i>	<i>Typical</i>
	<i>Partner selection: Less selective</i>	<i>Typical</i>
6. Impact on sexual safety	<i>Makes safer sexual practices less likely</i>	<i>Typical</i>
	<i>Does not make safer sexual practices less likely</i>	<i>Typical</i>
7. Perception of the sexual experience	<i>Positive</i>	<i>Typical</i>
	Negative	Variant
8. Changes to sexual arousal	<i>Heightens</i>	<i>Typical</i>
	Diminishes	Variant
9. Heightened sensation	<i>Heightened sensation: Sexual</i>	<i>Typical</i>
	Heightened sensation: Physical/non-sexual	Variant
10. Relaxation <sup>b</sup>		<i>Typical</i>
11. Disinhibition <sup>b</sup>		<i>Typical</i>
12. Impact on energy/activity level	Less energy	Variant
	More energy	Variant
13. Numbing <sup>b</sup>		Variant

Note. <sup>a</sup>Typical categories:  $\geq 50\%$  of participants. Variant categories: 15-49% of participants.

<sup>b</sup>Described further within text.

**Domain 1: Altered cognitive functioning.**

Regardless of substance, participants most commonly reported cognitive changes as a result of substance use; which were categorised into five groups: 1) global impairment; 2) impaired decision-making; 3) reduction in cognitive or emotional burden; 4) increased clarity or awareness; and 5) paranoia. These changes were often described as an impediment, although some reported favourable changes, such as increased clarity or reduced emotional burden.

***Global impairment.*** Nearly all participants reported some aspects of their thinking becoming impaired secondary to substance use, and were discussed both in general terms and about sexual encounters.

... definitely clouds it. At the time, you think you are thinking clearly ... and the next morning you can't remember what you've said to anyone. (alcohol)

... I'm not thinking clearly—I'm thinking sex, sex, sex. I'm not thinking about anything else ... very 'nowness' of the sex encounter. (amyl nitrite)

***Impaired decision-making.*** Participants reported difficulty making effective decisions and commonly cited sexual examples. Some regretted decisions made while using substances, or would make different decisions if they were not intoxicated, while some stated alcohol or other drug use helped to take less responsibility for decisions made while using. Although it remains unclear if substances were used as part of a plan for becoming more sexually adventurous or a post-hoc justification for behaviour while under the influence. A minority reported an absence of making important decisions.

... it gets in the way of making well thought out judgments. I might do things, take risks I wouldn't normally do and not think through consequences. (alcohol)

... I make decisions on amphetamines that I would not normally make when not on them ... like rimming, sharing of sex toys, possibility of increased sexual risk-taking. (stimulants)

... clouded ... I don't make any choices because I am aware I am stoned.  
(cannabis)

***Reduced cognitive/emotional burden.*** MSM reported using substances to escape or cope with life, *generally*, and/or regarding *specific* challenges associated with being gay—most commonly with alcohol and cannabis. These consequences are likely to contribute to increased substance misuse among MSM.

... with being gay you've been through a hard life younger ... alcohol is a way of forgetting ... it's another way of escaping. (alcohol)

... it clouds my ability to think and I think less clearly, which can be a good thing sometimes. (alcohol)

... it probably makes me a little bit more amiable, approachable and relaxed, less inhibited, more carefree. (cannabis)

***Increased clarity/awareness.*** MSM reported improved awareness (or perceived improvement) secondary to substance use, most commonly with cannabis and stimulants.

... I find when I smoke cannabis I wish I had a Dictaphone because my thinking processes tend to become very clear. It's like instant wisdom. (cannabis)

... at the time it appears to enhance clarity, however I think it actually does the opposite. (stimulants)

***Paranoia.*** Responses were specific to cannabis and stimulants, and were discussed as unpleasant and tolerated side effects. This is an example of a negative consequence that is tolerated in order to obtain other, positive effects such as a high or intoxication, disinhibition or sexual arousal.

... it probably makes me paranoid. Initially it's nice and a little bit of a high. It doesn't take long before it's a negative experience. I ruminate, become suspicious and it's very antisocial. (cannabis)

... during the first eight to 12 hours I feel in control and then it becomes messy and I have cognitive impairment ... paranoia. (stimulants)

## **Domain 2: Altered mood state.**

Three categories were identified: 1) improving/enhancing mood; 2) negatively effecting mood; and 3) enhancing pre-existing mood.

***Improves/enhances mood.*** Most MSM reported feelings of increased happiness, which may help to minimise negative situations or consequences of actions.

... I'm probably more of a happy drunk. (alcohol)

... it at first would do nothing, then make me happy and laugh like a child and then get incredibly sarcastic. I think everything is happy and funny. (cannabis)

... it makes you on a permanent happy. If you were ever in a bad situation, you don't realise what you're doing. (stimulants)

*Adversely effects mood.* Some MSM reported direct negative consequences on mood secondary to other effects (e.g., headaches). This consequence tended to be secondary to other negative side-effects of use, and similar to paranoia was something that was tolerated in order to obtain other desired effects.

... I want to be left alone and get short and snappy. (stimulants)

... I get grumpy if it gives me a headache. (amyl nitrite)

*Accentuates pre-existing mood.* A minority of MSM discussed a general heightening of mood or personality features, which can serve to heighten emotionality before or during sexual situations.

... it used to enhance or elevate existing mood. (alcohol)

... it puts a magnifying glass on emotions. (stimulants)

... it pushes all facets of personality to the extremities, especially emotions.  
(cannabis)

### **Domain 3: Impact on social interaction.**

MSM reported three main social effects: 1) facilitating interactions with others; 2) increasing personal confidence/sociability; and 3) decreasing capacity for social interaction. There were significant variations in individual responses, and the same substances were, at times, attributed to varied (and sometimes conflicting) social

consequences—suggesting other factors, beyond pharmacological aspects, are important.

***Facilitates interactions with others.*** Most MSM reported substance use was a ‘social lubricant’, making it easier to interact with others or fostering closeness. This can be manifested in increased meeting of sexual partners and increasing the rate of sexual closeness. Substances can help to break down barriers and increase the likelihood of becoming intimate more quickly.

... feel closer to the person than you are and feel more emotionally connected to the person. (amyl nitrite)

... perceiving interconnectedness with my (sexual) partner and feel like I am falling in love. (cannabis)

***Increases personal confidence/sociability.*** MSM described feeling more outgoing, confident or personally effective during or after substance use. Some participants referred to a sense of invulnerability with stimulants.

... increased confidence ... more forward ... I am more likely to be the first one to break the ice ... more suggestive ... I am able to perhaps act purely on instinct. (alcohol)

... a social lubricant that makes me more confident, sociable, talkative, bubbly and people oriented. (alcohol)

... more outgoing and gregarious, more analytical and talkative. The best I can be. (stimulants)

... it's a rush ... you feel ten feet tall and bullet proof and confident and happy.

(stimulants)

*Decreases capacity for social interaction.* A minority reported impaired sociability or conflict with others. In some cases, the inability to communicate could make negotiations regarding sexual activity difficult.

... it withholds me from anyone outside of my immediate safety circle. I do not really want to speak a great deal with others and want to be with a trusted other.

(cannabis)

... verbally, I can't interact with others ... null and void. (amyl nitrite)

... it gets in the way because I become self-centred, self-absorbed, self-focused and intolerant. (stimulants)

A few participants referred to a perception that socialising was enhanced while using substances, but in retrospect considered that it had a negative impact. This can contribute to a false sense of reality and well-being.

... the thing is with alcohol, initially you have increased confidence, think more sexual thoughts, but once you cross the line it falls apart...then no one wants to be with you. (alcohol)

... because it gives you energy and confidence, you don't really notice how much of a dick you're making of yourself, but others notice. (stimulants)

**Domain 4: Effects on the body.**

MSM reported 1) general physical consequences and 2) consequences specific to sexual activity.

***Feel sick/unpleasant.*** MSM reported feeling unwell during use and specific negative physical consequences (e.g., hangover). Again, similar to paranoia, this was described as being tolerated in order to obtain other, desired consequences.

... when on speed I get a locked jaw. (stimulants)

... usually it just makes me feel sick ... not good. (alcohol)

... I would have a splitting headache the next day and have had burn marks on my nose. (amyl nitrite)

***Sex more physically enjoyable/enhanced.*** MSM reported increased physical pleasure facilitated by substances, most commonly with amyl nitrite during sex.

... I'd say it's definitely a positive effect. The high kind of makes me feel more present in the situation and my sexual desires. (amyl nitrite)

... I find that I am more inclined to just enjoy the feeling for longer and climax is not the main issue. I want to enjoy every moment and put climax off. (stimulants)

... it tends to magnify feelings of orgasm and certain feelings of sex. (amyl nitrite)

**Domain 5: Impact on sexual activity.**

MSM reported patterns of sexual behaviour that were related to specific substance use, and were grouped into the three categories: 1) sexual performance (impaired or improved); 2) frequency of sexual contact (having more or less sexual activity); and 3) being less selective about partners. There was significant variation in consequences reported by the same participant, and across participants regarding a given substance, suggesting the role of factors other than those of pharmacological nature.

***Sexual functioning.***

*Impaired.* Problems with sexual functioning were most commonly attributed to alcohol, but were reported across all substances. A minority reported avoiding using substances if anticipating sexual contact due to these consequences, although other data suggest that opposite can be true (e.g., stimulant use to facilitate longer, more adventurous sex with multiple partners). Sometimes, MSM chose to be the receptive partner due to erectile difficulties, which can carry heightened risks for HIV transmission secondary to receptive UAI.

... it slows me down and makes me lethargic sometimes and it increases erectile difficulties. (alcohol)

... the decision is already made—either to drink socially or have sex. Because of the physiological effects of alcohol on performance and functioning I can't get a hard on. (alcohol)

... increased/heightened sexual arousal for five to 12 seconds and then is following by erectile difficulties. (amyl nitrite)

... if I'm a top I experience erectile difficulties. (stimulants)

*Improved.* Improved sexual functioning was reported by a small minority of MSM, and tended to be associated with anal sex being less painful or increased capacity to engage in sexual activity, which is associated with unique risks—particularly regarding stimulant use and prolonged, rougher sex and/or sex with multiple partners.

... it's a muscle relaxant. Intercourse is less painful and it helps to get over the first hump. (amyl nitrite)

... it makes me stay focused on having sex and block out other distractions.  
(stimulants)

... more physically stimulated, more energy, more turned on by the other person, more staying capacity, longer sex. (stimulants)

... it feels like things are longer, slower and enjoy more. It takes longer to climax and I enjoy myself to the maximum. (cannabis)

Some MSM reported substance use resulted in, both, improved *and* impaired sexual functioning, depending on dosage and sexual positioning. Thus, MSM may engage in more/less or different types of sexual activity depending on what and how much they have used.

... I can't have sex if I have too much alcohol ... I can't get it up. With a little bit of alcohol it enhances getting and maintaining erections. (alcohol)

... it depends on the position ... I lose an erection with too much if I'm a top. I'm more relaxed if I'm a bottom. (amyl nitrite)

... it feels good, but depends on the role I am playing. If I am a bottom it's fine. If I'm a top I have erectile difficulties—especially with condoms and definitely do it unsafe. (stimulants)

Thus, alcohol and other drug use can represent a balance between strategic use to obtain desired effects and minimising the likelihood of unwanted consequences.

***Engaging in sexual activity.*** Responses were equally divided regarding substance use resulting in more (typically with stimulants) or less sexual contact.

*More sexual activity:*

...probably more likely to have sex...more agreeable to having sex. (cannabis)

...usually effects to the point where I will go out looking for the type of sex I want...extreme, barebacking, fist fucking. (stimulants)

*Less sexual activity:*

...I may be more likely to lie around and not go out and look for sex.  
(cannabis)

...I just don't really have successful sex, I don't consider it...if I'm drinking I don't go out looking for sex and I wouldn't think about it. (alcohol)

***Less selective about partners.*** Most MSM reported becoming less discriminating about sexual partners, which has implications for number of sexual partners and decision-making around whom to have sex with.

... I'm not as choosy and again if I've had too much I probably don't even know who I'm having sex with. The awareness is gone. (cannabis)

... when I used to take it I would go to sex venues because it's instant, multiple partners and anonymous. It would also affect the type of partner—I become less fussy. (stimulants)

... I do not give a fuck who I pick up. It deludes me into believing a guy is really into me. (alcohol)

### **Domain 6: Impact on sexual risk-taking.**

Although participants were not *directly* asked about UAI, many respondents spontaneously reported on sexual risk-taking and UAI when discussing related topics.

*Makes safer sexual practices less likely.* The majority reported substance use resulting in increased sexual risk-taking (e.g., UAI) and were discussed across all substances in relation to a variety of circumstances, most commonly with stimulants. Due to the researchers particular interest in this domain due to possible direct health risks and implications, further analysis (in-depth review of transcripts and post-hoc between group comparisons) indicated a trend that those who *spontaneously* reported engaging in sexual risk-taking were generally heavier substance users and single. However, no other demographic differences were notable regarding age, education, employment or sexual orientation.

... the drunker you are the sleazier the person you pick up. You jump into something and don't know what you're doing. If you're really, really drunk you wouldn't care about safe sex—you just want to do it straight away and may not notice if a condom was used and may not ask for it. (alcohol)

... you let your guard down and have sexual contact with someone you wouldn't ordinarily have sex with. The ability to make rational judgments is gone. You think you are HIV-, but know you are HIV+. Caution goes to the wind. If they suggest barebacking it's easy to say ok and assume they are the same status. (stimulants)

... it totally blurs it. It breaks down any barriers, inhibitions or any control. I'm more likely to do things that I wouldn't do under the influence—certain sexual practices, unsafe sex. (amyl nitrite)

... it always pretty much makes it more likely to have unsafe sex due to heightened arousal. (amyl nitrite)

... it limits/ceases altogether the rules of safe sex. (stimulants)

*Does not make safer sexual practices less likely.* This perspective was uncommon and tended to be associated with other factors (e.g., not combining alcohol with sexual activity due to erectile difficulties; or sexual activity already occurring prior to amyl nitrite being used).

... it does not change my view on safety ... I still need to watch out for Hep C, because I am HIV+. (stimulants)

... it wouldn't change my view on condoms. (alcohol)

... to be honest, I am usually having whatever type of sex I'm having before the amyl comes out. (amyl nitrite)

... the decision is already made, either to drink socially or to have sex.

Because of the physiological effects of alcohol on performance and functioning I can't get a hard on. (alcohol)

### **Domain 7: Perception of sexual experience.**

MSM reported specific consequences to improve or enhance sexual experiences, most commonly with amyl nitrite.

#### ***Positive.***

... very powerful sexual buzz for 30 seconds. The whole point of doing it is to use it during sex to enhance the sexual experience. (amyl nitrite)

... feels fantastic, hypersensitive, more aroused, more sexual, more erogenous ... in more places. (stimulants)

... it's a relaxant and sex can be great when you're pissed. (alcohol)

***Negative.*** A minority reported negative sexual experiences, which were often related to competing negative side-effects.

... it's difficult to really put myself in the moment and it leads to decreased arousal and sexual playfulness and inhibits conversation. (cannabis)

### **Domain 8: Changes to sexual arousal.**

MSM reported increased sexual arousal secondary to substance use—which often coincided with increased sexual desire and seeking sexual contact. A minority reported the opposite.

***Heightens.***

... more physically stimulated, more energy, more turned on by the other person, more staying capacity, longer sex. (stimulants)

... I am more driven to find a partner to have sex with—particularly someone willing to participate in a three-some. It makes me want to have more contact with flesh and have the feeling of others next to me. They just make me really horny. (stimulants)

***Decreases.***

Reduced sexual arousal was, again, associated with other competing effects of substance use (e.g., paranoia).

... it can make me not want to have sex because I am paranoid. (cannabis)

... I think while you're on alcohol, you're drunk ... and it does affect when you're having sex with a guy. Sex doesn't last as long and less horny. (alcohol)

**Domain 9: Heightened sensation.**

MSM described changes to physical sensations as a result of substance use, discussed in *general* terms or with *specific* reference to sexual aspects.

***Physical/non-sexual.***

... it was more of a physical sensation and feeling high. (amyl nitrite)

... physically they increased stimulation ... they are enhanced. (amyl nitrite)

... it lightens my mood ... it makes me more physically sensitive. (cannabis)

***Sexual.***

... one becomes more tactile—particularly sensitive and it heightens my sensitivity to areas that are already sensitive. I become extremely aroused.  
(cannabis)

... anal sex is less painful. It heightens receptions of feelings. It makes me feel more confident to explore sexually. (alcohol)

**Domain 10: Relaxation.**

Relaxation effects were described as feeling relaxed physically, mentally and/or emotionally.

... it relaxes me, calms me, stops me over processing. (cannabis)

... it takes a lot of my guards down and I feel more relaxed to go with the flow.  
(alcohol)

... a muscle relaxant, it doesn't really affect my mood. (amyl nitrite)

**Domain 11: Disinhibition.**

MSM reported a reduced capacity or willingness to inhibit natural or automatic tendencies.

... it kinda lowers your inhibitions and you tend to worry about the consequences the next day like of not using condoms or sex with not my style of person. (alcohol)

... having lower inhibitions, I am open more to suggestions. I am tempted to try new things ... partner pissing on me, group sex. (alcohol)

... increased inhibition. It erodes my sense of control ... my own loss of control and increased unsafe sex. (amyl nitrite)

### **Domain 12: Impact on energy/activity level.**

Approximately half reported 1) reduced energy or activity associated with alcohol and cannabis, while the remainder reported 2) increased energy associated with stimulants.

#### ***Less energy.***

... it's not a good idea to operate machinery or anything technical ... it makes me lazy and lackadaisical. (cannabis)

***More energy.*** MSM described increased energy within specific social and sexual situations, while others provided more general descriptions.

... it reduces my inhibitions and prolongs my social energy for the evening.  
(stimulants)

... I am very active and awake. (cannabis)

### **Domain 13: Numbing.**

Numbing was described by MSM in relation to physical and/or emotional states.

... it makes you feel a bit numb. You can fall down a flight of stairs and it would only hurt for one second. (stimulants)

... a little bit I find heightens and a little bit more sensitive. Too much or too strong it's more numbing. (cannabis)

### **Substance-specific Comparisons**

Comparisons outlined in Table 3 provide a useful framework for understanding similarities and differences across the range of substances. Participants reported a variety of comparisons and contrasts regarding the effects of various substances.

**Table 3: Results of qualitative analysis of gay/bisexual men’s substance-specific beliefs regarding consequences of substance use**

Substance	Category <sup>1</sup>
Alcohol	Global impairment Facilitates interaction with others Increases personal confidence/sociability Improves/enhances mood Impaired sexual functioning Makes safer sexual practices less likely Impaired decision-making
Cannabis	Relaxation Global impairment Facilitates interaction with others Does not make sexual practices less likely Heightened sensation: Sexual Improves/enhances mood
Amyl nitrite	Global impairment Feel sick or unpleasant Heightened arousal Sex more physically enjoyable/enhanced Impaired decision-making
Stimulants	Global impairment Impaired decision-making Improves/enhances mood Increases personal confidence/sociability

*Note.* <sup>1</sup>Reported by the greatest number of participants for each substance type, listed in order of frequency.

**Similarities.** Global impairment was strongly associated with all substances, while improved mood and impaired decision-making specifically featured across three of the four substance types. This combination of effects may carry heightened risks to behaviours post-use. For example, not thinking clearly, having a significantly elevated mood *and* having difficulty making good decisions, could lead to more impulsive decision-making which is regretted later.

... it's (cannabis) kind of like ecstasy. I'm a tactile, loving person. My inhibitions are dropped more.

... like amphetamines I become more adventurous (when drinking). I used to not be able to have sex unless I was pissed. It's the hedonistic nature of a lot of gay men ... always wanting to make it (sex) better.

... (alcohol is) similar to marijuana. I'm more likely to have sex with anyone the more alcohol I have. I'm more agreeable to unprotected sex if I've had a few drinks.

...I guess with alcohol I am a lot more extroverted...I can be a lot more outgoing and talk to strangers a lot easier than normally—being slightly introverted. Speed really helps me come out of my shell a lot.

**Differences.** Participants also reported *distinct* effects associated with each substance, such as increased confidence or sociability (alcohol), heightened sensation (amyl nitrite), relaxation (cannabis), and increased confidence or sociability (stimulants). Given that experience of multiple drugs was the norm within this group these substances are likely to be specifically sought out to obtain these desired consequences. Significant individual variation existed across respondents and substance classes, suggesting that other factors, beyond pharmacological effects, such as those related to social learning, are likely to operate.

... I just don't really have successful sex (when drinking). I don't consider it. If I did it would be spontaneous. If I'm drinking I don't go out looking for sex and I wouldn't think about it. On other drugs I would.

... I suppose. The thing is with alcohol ... initially, you have increased confidence, think more sexual thoughts ... but once you cross the line (i.e. drink too much) it falls apart. Then no one wants to be with you. On amphetamines you can just go and go and go.

... unlike alcohol and amphetamines ... where you are so buzzed and high you would go to a sauna ... one snort of amyl would not drive you to go to a sauna. You use once you are having sexual contact ... a secondary aid.

### **Poly-substance use.**

Participants provided commentary on the commonly strategic use of substances to achieve desired effects, or to reduce adverse consequences of another substance. MSM appear to use substances in a strategic, deliberate and functional manner—often to facilitate sexual experiences or maximise pleasure. Patterns of poly-substance use are of particular interest as they can carry heightened risks to health and related harms.

... I normally don't mix drugs when I am high, only at start or during the come down. It got me a little more relaxed to start the night with. And it was a money saver as well. You weren't going to pop a pill too early in the night because it will wear off too soon and you wouldn't want to pay another 60 bucks for another one. I guess there was not other drugs left so had more alcohol in the morning.

... LSD and marijuana are a pretty potent blend. The time I took acid and ecstasy together was probably the most blissful trip I'd ever had. Actually I had some alcohol plus some kind of veterinarian steroid and I was quite ill later on in the night.

... I used to take speed, pot and alcohol ... and amyl for a huge effect with Rohypnol or heroin to bring you back down.

... I did take a lot of marijuana with those drugs ... nearly every time I took those drugs. I was smoking pot anyways nearly every day. Speed erases the effect of marijuana generally.

... marijuana makes me a lot dopier. I used to take it with another drug to heighten the effect ... I didn't take it solely. It was always to heighten the experience of the other drug.

... alcohol helps me when I go out because I smoke so much pot I actually find it boring to go out. Alcohol compensates. I try not to get that bad (drunk). And most of the other drugs build confidence ... except acid of course.

Specific effects on sexual practices, including unsafe sex, with combination substance use were specifically mentioned.

... without amyl and Viagra I'd be lucky to have an erection for 20 minutes ... now I can have one for 4 hours.

... cocaine makes me want unsafe sex, especially when mixed with speed.

## **Discussion**

### **Substance Use and the Transformative Experiences of Gay and Bisexual Men**

These data allowed for richer understanding of the effects of a wider range of substances, in contrast to previous studies and were specific to an Australian context. MSM reported a broad range of reinforcing consequences of substance use, which

were common across substance types and specific to a particular substance. These consequences formed multiple layers (e.g., social, cognitive, emotional) in their effects. These findings share some similarities with the functions of substance use investigated among young people in the United Kingdom (e.g., increase energy, increase confidence; Boys, Marsden, Fountain, Griffiths, Stillwell, & Stand, 1999; Boys, Marsden, & Stan, 2000), although several distinctions are evident among the sample of MSM including a more pronounced sexual focus. MSM reported consequences that were *general* (e.g., cognitive functioning, social interaction, mood) and *specific* to sexual aspects of their lives (e.g., arousal, sexual activity, perception of sexual experience, sexual safety). MSM reported seeking desired consequences of substance use in a strategic or intentional manner. Increased clarity and enhanced social experiences were discussed positively. Other consequences (e.g., paranoia) were perceived as either a deterrent to use or something tolerated in order to obtain more positively reinforcing consequences (e.g., increased energy). Others would make decisions about substance use based on anticipated side-effects, such as not planning to engage in sexual activity if they were intending to binge drink due to impaired sexual functioning. In addition, substances were commonly used for anticipated sexual contact, such as stimulants for prolonged periods of adventurous sex. Thus, MSM seek out and use certain drugs specifically to enhance sex and pleasure (Halkitis et al., 2003; Halkitis, Fischgrund, & Parsons, 2005; Prestage et al., 2007b) or to facilitate cognitive disengagement regarding sexual safety (McKirnan et al., 2001; Ostrow, 2000). However, variation existed regarding drug of choice among users and the consequences experienced—suggesting that substance types were associated with predictable consequences based on pharmacological agents, although other factors (e.g., expectancies, contexts of use)

were also likely to influence drug selection and their perceived effects (Halkitis et al., 2005; LaBrie et al., 2002; Parsons et al., 2005).

Key consequences of substance use among MSM are likely to influence sexual decisions and risk-taking, and carry heightened impacts due to specific social-cultural factors and the prevalence of HIV. For example, some MSM may experience significant stress, anxiety or isolation regarding being gay and use substances more heavily to enhance their mood and to cope. MSM commonly experienced impaired cognitive functioning, enhanced mood *and* difficulty making decisions. Participants also reported *specific* effects associated with a given substance, such as stimulant use increasing confidence. These effects can independently *and* cumulatively, or synergistically, impact upon behaviour during and after use. In the case of amyl nitrite, the combination of impaired cognitive functioning, heightened arousal, enhanced sexual experiences *and* reduced decision-making capacity may increase the likelihood of UAI and HIV transmission. Although men in the current study were not specifically asked about their HIV status, comprehensive details regarding sexual practices or level of concern about HIV transmission—these topics were commonly spontaneously reported on during interviews. Participant's specific motivations, beliefs and concerns in relation to sexual risk behaviour and HIV transmission require further investigation. However, from these data it can be concluded that participant's substance use results in a variety of consequences that are likely to directly and indirectly impact upon decision-making and sexual activity—including UAI.

Differences in outcomes related to substance use were evident based on dosage or time since last use, and there was significant individual variation in effects within

and across substances. Some of the effects were paradoxical and complex (e.g., stimulants can result in elation, aggression *and* paranoia). Similar consequences were also attributable to different substances, despite significant variations in specific pharmacological properties. For example, both stimulants and alcohol (a depressant) were reported to increase energy levels, lending support for expectancy theory and the role of individual beliefs on the specific effects of a given substance (Bimbi et al., 2006; Young & Oei, 1993). Previous research suggests that these beliefs can influence future patterns of substance use *and* behaviour secondary to use (Derman & Cooper, 1994a).

Responses from MSM indicate some important differences from findings with other population groups using different methodologies (Derman & Cooper, 1994b; Weinhardt et al., 2002). MSM focused more heavily on the reinforcing consequences of substances in relation to specific aspects of sexual encounters (e.g., UAI) and within sexual contexts (e.g., saunas). Other differences included investigation of a wider range of substances used by MSM, distinct drug effects (e.g., heightened sexual sensation with amyl nitrite use) and effects of substance use in combination (Drumright et al., 2006). Similarities were drawn between the specific effects of a favoured illicit substance and alcohol (e.g., both alcohol and amphetamines increasing sociability). Contrasts focused on specific benefits of illicit drugs over alcohol (e.g., amphetamines providing greater sustained energy), or highlighted the adverse effects of alcohol (versus other drugs) on sexual functioning. Combination use was often strategic, heightening the effects of one or more substances (e.g., acid with ecstasy or cannabis) or managing side-effects of other substances (e.g., using heroin to 'come down' from amphetamines).

### **What is the Interface between Substance Use, Sexual Activity and Sexual Risk-taking?**

The consequences of substance use among this Australian community sample of MSM, based on their own experience is related to sexual activity via layers of *direct* (sexual) and *indirect* (general) mechanisms. Approximately half of the domains identified pertained to general consequences, while half related to sexual consequences. Some of the direct mechanisms include heightened sexual arousal, heightened sexual sensation, enhanced sexual experiences, engaging in more sexual activity and becoming less selective about sexual partners. Consequences of substance use can be conceptualised as operating along a temporal continuum where proximity to the sexual encounter may be an important determinant of the nature of sexual activity. For example, distal factors such as facilitating meeting or pursuing sexual partners and proximal factors may be more amenable to change in negotiating behaviour than heightened sexual sensation.

Other reported consequences have indirect implications for sexual activity, such as impaired cognitive functioning, disinhibition, increased confidence or sociability, poorer decision-making, increased energy or activity level and reduced cognitive or emotional burden. These effects may further increase the likelihood of MSM making unrealistic risk estimates, selecting partners they might not normally have sex with, having difficulties negotiating safe sex, and/or making choices that may favour immediate reinforcement (e.g., sexual gratification, intimacy) over longer term implications (e.g., sexually transmissible infections, HIV transmission). Participants considered that substance use impacted upon sexual safety in all substance classes, and was associated with heavier use. In addition, combination use

was commonly associated with sexual activity and may pose greater risks for HIV transmission. Future research should more systematically explore these relationships across the range of commonly used substances.

### **Implications for Prevention and Interventions**

Implications are comprehensively discussed in Chapter 9, with regard to findings from the program of research in its entirety.

### **Limitations**

Limitations are comprehensively discussed in Chapter 9.

### **Future Research**

Although poly-substance use is common among this cohort, this data set was primarily disaggregated by substance class, as this was a first step examining multiple substance effects in the same cohort is an important advance. Future research should systematically investigate perceived consequences related to poly-substance use and also separate effects specific to substances within the same substance class (i.e. differences between crystal meth, amphetamines and ecstasy), consider a wider range of substances used by MSM (e.g., GHB, Viagra<sup>®</sup>), and specifically measure substance dosage. The HIV status of participants was not specifically asked in the protocol and this may impact upon sexual practices (e.g., strategic positioning, negotiated safety, sero-sorting; Crawford, Rodden, Kippax, & Van de Ven, 2001). Further, additional research with other samples of MSM (e.g., internationally) is needed to confirm generalisability of findings.

### **Chapter Summary**

Overall, this study identified a wide range of consequences of substance use by this sample group of MSM, including effects common across substance classes, effects specific to substance classes and individual variation. Prevention approaches and interventions need to consider the breadth and variety of substance use effects in tailoring more effective education programs to reduce associated harm. Findings from the current study lend support for the role of specific beliefs (e.g., expectancies) related to substance use on subsequent cognitive, emotional and behavioural processes, including sexual activity. Additional quantitative research with a larger sample is warranted to further enrich understanding of the roles and functions of multiple substance use in the lives of MSM, as well as the associated consequences.

## **Chapter 4: Phase 2—Development of the Cannabis Expectancy Questionnaire for Men who have Sex with Men (CEQ-MSM):**

### **A Measure of Substance-related Beliefs**

#### **Purpose of the Study**

Substance-related expectancies are associated with substance use and post-substance use thoughts, feelings and behaviours. The expectancies held by specific cultural or sub-cultural groups have rarely been investigated. This research mapped expectancies specific to gay and other MSM and examines their associations with substance patterns and behaviours following cannabis use. These behaviours included sexual practices (e.g., UAI). This study described the development of a measure of such beliefs for cannabis, the CEQ-MSM. Expectancy items were selected through a small group discussion and subsequent interview processes and were then piloted on a community sample of MSM via an online questionnaire. Statistical analyses were used to distinguish distinct domains of substance reinforcement and to assess the reliability and validity of the measure. It is anticipated that future applications of the CEQ-MSM in health promotion, clinical settings and research may contribute to reducing harm associated with substance use among MSM, including HIV transmission.

#### **Introduction**

Previous research demonstrates an association between substance-related expectancies with substance use (including cannabis), and post use thoughts, feelings and behaviours (Hull & Young, 1983; Goldman et al., 1987; Oei & Young, 1987; Young & Oei, 1993). Examples of such expectancies related to alcohol include, “I

am more romantic when I drink” and “I think less clearly when drinking” (Young & Knight, 1989); and “When I am having sex, I can only think of what is going on in the moment” (Gold et al., 1991). Expectations about the effects of a given substance, as well as the context in which people learn how to use a drug, are likely to significantly impact upon behaviour during and after use. For example, LaBrie and colleagues (2002) found that college students who believed that alcohol use negatively impacted upon condom use were more likely to use greater amounts of alcohol and were less likely to use condoms. Expectancies are hypothesised as a key mediating variable regarding substance use and sexual risk-taking, and *specific* sexual effects among MSM carry heightened risk (e.g., HIV exposure). However, little is known about the reported reinforcement (i.e., perceived consequences) from the range of substances used among MSM.

Existing measures systematically assess substance-related effects (most commonly pertaining to alcohol) in the general population (Brown et al., 1980; Fromme et al., 1993; Ham, Stewart, Norton, & Hope, 2005; LaBrie et al., 2002; Young & Knight, 1989; Young & Oei, 1998) and specific groups (e.g., adolescents; Derman & Cooper, 1994b). Studies specifically involving other cultural or sub-cultural groups (e.g., MSM, HIV-infected individuals) are rare, and necessary for advancing research in relation to reducing harms associated with HIV risk behaviours while under the influence (Maisto, 2010; Halkitis & Parsons, 2002; Mullens et al., 2010). MSM experience *unique* reasons for use (e.g., coping with internalised homophobia; Huebner et al., 2002), patterns and contexts of use, and associated harm (e.g., HIV). MSM experience unique challenges regarding discrimination, rejection and stigma (Herdt, 1997). These challenges can impact upon well-being and pose significant risks for depression, suicide, and substance

misuse (Cabaj, 2000). Substance use may help MSM cope with specific stressors associated with sexuality (Cabaj, 2000). Such use is related to poor self-image, stress reduction and coping with sexual identity (Hatzenbuehler et al., 2008; McKirnan & Peterson, 1988) and is related to level of gay community affiliation (Knox et al., 1999; Van de Ven, Rawstorne, Crawford, & Kippax, 2002). MSM also have higher rates of substance use and poly-drug use (Cabaj, 2000; Frankland et al., 2007; Mattison et al., 2001; Pitts et al., 2006). Existing measures may not tap a sufficient range of reinforcing aspects of substance use (LaBrie et al., 2002; McKirnan et al., 2001; Parsons et al., 2004) nor hold adequate psychometric properties (e.g., exploratory and qualitative studies; Bimbi et al., 2006; Myers et al., 2004). In addition, the terminology and ideas included in existing expectancy measures may not be perceived as relevant to the lived experience of MSM (Halkitis & Parsons, 2002; Mullens et al., 2009b; 2010; Ostrow, 2000; Semple et al., 2002).

Cultural norms and beliefs guide the development and maintenance of expectancies (Bittner, 1997; Peele, 1997; Young & Knight, 1989). For some MSM, alcohol and other substance use is highly associated with sexualised contexts (e.g., SOPV), gay party cultures (e.g., barebacking; Halkitis et al., 2003), and more adventurous sexual practices. Equally, substances may be used alone, or in combination, to achieve specific sexual effects (e.g., use of Viagra<sup>®</sup> combined with alcohol to counteract sexual impairment secondary to intoxication; use of amyl nitrite to heighten orgasms, use of amphetamines to allow for prolonged sexual contact with multiple partners). Substance use before or during sex is also associated with unsafe sexual practices and HIV sero-conversion (Colfax et al., 2004; Leigh & Stall, 1993; Parsons et al., 2005).

A few mixed-method studies (qualitative/quantitative) have explored a limited range of consequences of substance use by MSM (Bimbi et al., 2006; Mullens et al., 2009b; Myers et al., 2004). Existing measures may not sufficiently capture the range of alcohol-related outcomes relevant to this group. This study aims to develop a culturally appropriate and psychometrically robust measure of cannabis use expectancies, involving MSM from its inception, and provide information about perceived effects of cannabis on thoughts, feeling and behaviours, including sexual behaviours.

## **Method**

### **Qualitative phase.**

*Sample and procedures.* See Chapter 3 for methodology regarding small group discussion and interview data collection. Recorded transcripts were transcribed for data analyses [described elsewhere; see Mullens et al. (2009b)], which revealed a comprehensive listing of 60 outcomes relevant to cannabis.

### **Refinement of the Measure**

The 60 cannabis expectancy items were reviewed by an expert panel (see Appendix B), comprised of individuals working in the gay community or health sector ( $n = 4$ ) and members of the target group (MSM;  $n = 3$ ) for consensus. This review focused on readability, redundancy, appropriateness and relevancy. As a result of this process 16 items were removed. The item format, based on existing measures (Young & Knight, 1989), used a five-point Likert scale (“strongly disagree” to “strongly agree”) with instructions: “Please rate these statements based

on your beliefs about cannabis”. The questionnaire was piloted for suitability among a small group of individuals working in the gay community or health sector (n = 5) and members of the target group (MSM; n = 5), for readability and cultural relevance. Minor changes to wording (e.g., including other commonly used terms for cannabis, including “queer” as an option for sexual orientation) after this process, however no significant changes to the content of the CEQ-MSM were made before administration to a larger sample of MSM via an online survey. No further items were removed or modified during pilot testing.

### **Administration**

The CEQ-MSM was completed online by a community sample of MSM in Australia, using *SurveyMaker* (Emu Design, Fortitude Valley), recruited through advertisements in gay community organisations, media, venues (e.g., saunas), and snowball sampling. Ethics approval was granted through the Human Research Ethics Committees at The Prince Charles Health Service District and Queensland University of Technology. Informed consent was obtained within the online protocol, with text stating to participants that clicking on the specified icon was indication of providing consent and would subsequently direct them to the questionnaire.

### **Results**

#### **Data analysis.**

Data from the 44-item CEQ-MSM were refined using item analysis statistics. Retained items approximated a normal distribution (kurtosis: -0.70-0.70, skewness: -

0.75-0.75). These 32 items were analysed using principal axis factor analysis. An oblique rotation was selected because it revealed superior simple structure (Kaiser, 1958; Thurstone, 1947), and factors were assumed to be related. Solutions were rotated to direct Oblimin criterion. Items which did not load over 0.40 were not included (Young & Knight, 1989). The 28 remaining items comprised the revised CEQ-MSM (see Table 4).

### **Demographics.**

The sample was comprised of 180 MSM (who reported lifetime use of cannabis). Mean age: 34 years ( $SD = 12.0$ , 18-71). Ninety-two percent identified as “gay/homosexual”, 4.8% “bisexual”, 2.1% “unsure/undecided”, 1.1% “queer” and 1.1% “straight/heterosexual”. Approximately half were single (54%), 65% were employed full-time, and 84% lived in “urban/metro” area. Seven (7%) percent identified as being from a “culturally and/or linguistically diverse” (CALD) background, 2% Aboriginal, and 0.6% Torres Strait Islander. Seventeen percent completed Year 10, 36% Year 12, 25% tertiary adult education or trade certificate, 36% university, and 17% post-graduate studies.

**Table 4: Items comprising the CEQ-MSM (including M and SD)**

		<b>M</b>	<b>SD</b>
<b>Factor 1</b>	<b><i>“Enhanced sexual experience”</i></b>		
Item #8	Sex is better when I’ve been using cannabis	2.97	1.03
Item #11	Using cannabis makes sex last longer	2.94	1.01
Item #12	I have more adventurous sex when using cannabis	2.79	1.94
Item #14	Sex tends to be more loving when using cannabis	2.62	0.94
Item #23	I feel more relaxed during sex when I’ve used cannabis	3.07	0.94
Item #25	My sexual performance is enhanced when using cannabis	2.62	0.91
<b>Factor 2</b>	<b><i>“Sexual negotiation”</i></b>		
Item #2	I’m less likely to discuss my/my partner’s HIV status with my partner during sex when using cannabis	2.00	1.00
Item #5	I’m more likely to have sex without a condom when I’ve been using cannabis	2.18	1.03
Item #7	I make decisions about sex I would not make if not using cannabis	2.38	0.91
Item #15	When I use cannabis I may think unsafe sex is okay at the time	2.06	0.97
Item #22	I am less likely to ask for/discuss condoms if I’ve had cannabis	2.21	1.05
Item #24	When I use cannabis I am less choosy about sexual partners	2.44	0.95
Item #26	I let sexual partners make decisions for me when using cannabis	2.23	0.97
<b>Factor 3</b>	<b><i>“Cognitive impairment”</i></b>		
Item #1	Using cannabis makes it difficult for me to concentrate	3.60	1.07
Item #3	Using cannabis makes me feel numb	3.30	1.11
Item #6	I don’t think clearly when using cannabis	3.60	1.06
Item #18	I’m more likely to make bad decisions when I’m using cannabis	3.24	1.04
<b>Factor 4</b>	<b><i>“Social and emotional facilitation”</i></b>		
Item #9	Using cannabis helps me to escape from my problems	2.63	1.11
Item #10	When I use cannabis I feel more loving	2.76	1.03
Item #13	I feel more connected with other people when I use cannabis	2.78	1.01
Item #17	I feel more accepted by others when I use cannabis	2.53	0.93
Item #21	I feel more carefree when using cannabis	3.21	1.02
<b>Factor 5</b>	<b><i>“Enhanced sexual desire”</i></b>		
Item #4	My emotions are heightened when using cannabis	3.24	0.98
Item #20	When using cannabis I feel more horny or sexually aroused	2.95	1.06
Item #27	When I use cannabis my body is more physically sensitive	3.05	0.98
Item #28	I think about sex more often when I’m using cannabis	2.61	1.01
<b>Factor 6</b>	<b><i>“Sexual disinhibition”</i></b>		
Item #16	I’m more likely to let others know I’m attracted to them when I use cannabis	2.98	1.04
Item #19	It’s easier to express my sexual needs or desires when I use cannabis	2.80	0.98

**Substance use.**

*Lifetime.* The following used each substance: 100% alcohol, 100% cannabis, 86% tobacco, 66% ecstasy, 64% amyl nitrite, 56% amphetamine, 39% cocaine, 38% prescription medications, 35% LSD, 34% methamphetamine, 29% nitrous oxide, 24% ketamine, 20% hallucinogens, and 8% heroin.

*Past three months (of those who reported lifetime use).* Nearly all (95%) used alcohol, 75% tobacco, 51% ecstasy, 43% amyl nitrite, 38% cannabis, 37% prescription medications (for recreational purposes; e.g., Viagra<sup>®</sup>), 16% methamphetamine 15% amphetamine, 8% cocaine, 6% ketamine, 5% hallucinogens, 4% LSD, 3% heroin, and 3% nitrous oxide.

*Recent cannabis use (of those who reported use in the past three months).*

Approximately one quarter (28%) used cannabis in the past month, reporting a mean of 9.6 days use ( $SD = 10.4$ ; 1 – 30; Median = 3), and 1.7 THC units ( $SD = 1.6$ ; 0.5 – 6.0; Median = 1.0).

**Item Selection Through EFA**

Factor 1, “Enhanced sexual experience”, accounted for 31% of the total variance. Factor 2, “Sexual negotiation”, accounted for 15% of the variance. Factor 3, “Cognitive impairment”, explained 8% of the variance. Factor 4, “Social and emotional facilitation”, accounted for 6% of the variance. Factor 5, “Enhanced sexual desire”, explained 4% of the variance. Factor 6, “Sexual disinhibition”, accounted for 3% of the variance (see Table 5).

**Table 5: Factor analysis pattern matrix for the CEQ-MSM**

Item	Factor Loadings (6 Factors)					
	1	2	3	4	5	6
11	0.824					
12	0.751					
23	0.677					
8	0.659					
14	0.633					
25	0.528					
5		0.887				
22		0.880				
7		0.818				
15		0.814				
2		0.778				
26		0.722				
24		0.698				
1			0.779			
6			0.678			
18			0.605			
3			0.458			
10				0.740		
13				0.691		
17				0.658		
9				0.522		
21				0.471		
20					0.639	
27					0.524	
4					0.450	
28					0.439	
19						-0.523
6						-0.459

*Note. See Table 4 for specific items*

### Evaluation of Factor Performance: Exploratory Sample

#### Predictive validity.

A regression analysis tested the generality of findings, and examined predictions of consumption. The overall regression equation accounted for 28% of the variance in frequency of consumption ( $R^2 = 28.40$ ), and was significant [ $F(6, 38) = 2.56, p = .038$ ]. The outcome expectancy “Cognitive impairment” emerged as the only significant univariate predictor (see Table 6).

**Table 6: Hierarchical regression analyses with CEQ-MSM factors predicting cannabis use**

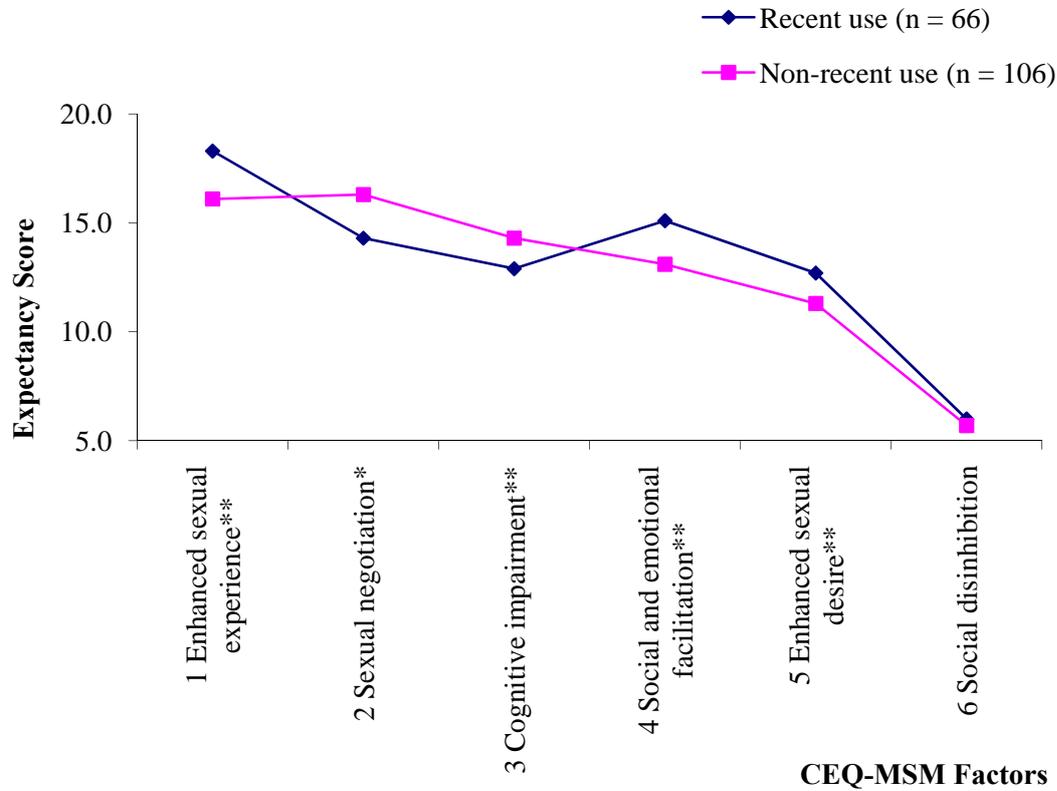
<i>R square</i>	0.284				
<i>Model</i>	0.038				
Factor	Beta	Significance	Partial Correlation	$\beta^2$	Factor name
constant		0.46			
1	-0.057	0.77	-0.040	0.774	Enhanced sexual experience
2	-0.127	0.40	-0.116	0.403	Sexual negotiation
3	-0.294	<b>0.05</b>	<b>-0.278</b>	<b>0.050</b>	<b>Cognitive impairment</b>
4	0.191	0.28	0.150	0.281	Social & emotional facilitation
5	0.232	0.24	0.162	0.244	Enhanced sexual desire
6	0.139	0.48	0.099	0.476	Sexual disinhibition

*Note.* Significant predictors are in bold

#### Discriminant validity.

Post-hoc t-tests were conducted to determine if cannabis expectancies predicted cannabis use in the past three months. The relative strength of expectancy

scores across all factors were compared between recent (past three months) and non-recent users (Figure 3).



Note. \*\*  $p < 0.01$  and \*  $p < 0.05$

**Figure 3: Expectancy scores among recent and non-recent cannabis users**

Four of the six comparisons reached a significance of  $p < 0.01$  and one reached  $p < 0.05$ . To further test the specificity of the CEQ-MSM, post-hoc t-tests examined whether cannabis expectancies predicted alcohol and stimulant use in the past three months. There were no statistically significant differences for alcohol ( $p > 0.05$ ) or stimulant use ( $p > 0.19$ )—indicating cannabis expectancies did not predict use of these substances.

### Correlations.

The six CEQ-MSM factors were correlated using Pearson's product moment.

The mean correlation within the CEQ-MSM was  $r = \pm 0.27$  (0.01 - 0.65).

Correlations between the CEQ-MSM and reported frequency of recent cannabis (days of use in the past month) had a mean of  $r = \pm 0.28$  (0.07 - 0.36; see Table 7).

**Table 7: Zero-order correlations of the CEQ-MSM factors in the exploratory sample**

Factor	1	2	3	4	5	6
1. Enhanced sexual experience	---					
2. Sexual negotiation	0.28**	---				
3. Cognitive impairment	-0.07	0.23**	---			
4. Social and emotional facilitation	0.51**	0.20*	-0.15*	---		
5. Enhanced sexual desire	0.65**	0.27**	0.01	0.45**	---	
6. Sexual disinhibition	0.58**	0.29**	0.02	0.55**	0.61**	---

Note. \* =  $p < 0.05$ ; \*\* =  $p < 0.01$

Further, correlations between the CEQ-MSM and frequency and quantity x frequency (QF) were conducted. The mean between scale correlation with frequency was  $r = \pm 0.14$  (0.05 - 0.33). The mean between scale correlation with QF was  $r = \pm 0.15$  (0.03 - 0.39; see Table 8).

**Table 8: Zero-order correlations of the CEQ-MSM factors and cannabis use in the past 30 days in the exploratory sample**

Factor	1	2	3	4	5	6
Frequency	0.26	-0.07	-0.34*	0.36*	0.33*	0.31*
Quantity	0.05	-0.09	-0.33*	0.22	0.10	0.06
QF	0.05	-0.03	-0.39**	0.17	0.15	0.10

Note. \* =  $p < 0.05$ ; \*\* =  $p < 0.01$

**Reliability.**

The internal reliability of factors was assessed using Cronbachs' alpha (average  $r = 0.85$ ). Factors 1 (0.91), 2 (0.93), 4 (0.80) and 6 (0.82) demonstrated a high level of internal consistency, while Factors 3 (0.74) and 4 (0.74) were good. Split-half reliability analyses were conducted using the Guttman Split-Half coefficient (average:  $r = 0.79$ ). Factors 1 (0.93), 2 (0.89) and 6 (0.82) demonstrated a high level of split-half reliability, Factors 3 (0.73) and 4 (0.70) were good, and Factor 5 (0.67) was acceptable.

**Discussion**

The CEQ-MSM was developed as a culturally appropriate and psychometrically robust measure for MSM. Factor analysis from this community sample revealed the CEQ-MSM consisted of six domains of expected reinforcement. Each factor explained a unique percentage of the variance with high internal consistency. The strength and reliability of these factors, along with their relative independence, were confirmed. All factors showed adequate reliability and validity. The consequences within each factor have face validity—they are thematically related, which provides confidence that factors are meaningful. The measure holds adequate predictive and discriminant validity, and unique *specific* effects exist (e.g., cognitive impairment may be a *protective* factor—increased impairment associated with lower usage).

Findings are consistent with self-report data (Mullens et al., 2009b) and prior descriptive and epidemiological data (Colfax et al., 2004; Green & Halkitis, 2006; Parsons et al., 2005; Prestage, 2007a; Smith et al., 2004). There are direct and

indirect effects of cannabis use on sexual activity and risk-taking, and effects can be considered along a temporal spectrum. Findings extend knowledge of the range of consequences experienced by MSM regarding cannabis use. Results indicate a more extensive variety of reinforcing aspects (e.g., sexual and non-sexual) than those reported among the general population, particularly with a heightened focus on sexual activity or pleasure (Brown, et al., 1980; Fromme et al., 1993; LaBrie et al., 2002). Compared to previous limited research, the CEQ-MSM taps a wider range of reinforcing consequences and has been developed a priori in conjunction with MSM (Bimbi et al., 2006; Myers et al., 2004). This study provides a unique contribution, as no other such measure exists, which may be particularly salient due to unique patterns and contexts of substance use among MSM (Mullens et al., 2009b; Smith et al., 2004; Prestage 2007a; 2007b).

The strong association between substance use and sexual activity has implications for HIV transmission and health promotion (Colfax et al., 2004; Leigh, 1989; Mullens et al., 2009b; Myers et al., 2004; Parsons et al., 2005). It is important for clinicians to develop and utilise adequate ways of assessing substance use, sexual orientation and patterns of sexual behaviour, and to consider cultural aspects of use.

### **Implications.**

Each of the factors associated with distinct reinforcement secondary to cannabis use are considered in terms of the specific implications of the current study. For example, MSM who use cannabis to enhance sexual experiences, experience sexual inhibition or experience difficulties with sexual negotiation secondary to use could be encouraged to develop more creative sexual practices and educate and empower them to maintain safer sex while under the influence, including enhancing

their self-efficacy to consistently use condoms. This could be conducted as part of an HIV prevention initiative in conjunction with relevant community groups that focus on gay health initiatives. This could also incorporate perceptions in relation to sexual desire and sexual inhibition, in an effort to identify, challenge and modify such beliefs that may contribute to cannabis misuse and associated harm (e.g., sexual risk-taking). MSM who use cannabis for social or emotional gains may benefit from interventions to explore alternative means to achieve these consequences aside from cannabis use (e.g., joining a gay community art class to socialise). Further, adequate treatment options for MSM experiencing mental health issues (e.g., depression) that may increase the likelihood of using cannabis for emotional relief, should also be further developed to ensure they are accessible and adequately meeting the needs of MSM. Cognitive impairment is perceived as a negative consequence of use, that may help to motivate individuals to reduce their frequency and quantity of use when incorporated into individual clinical interventions [e.g., cognitive behavioural therapy (CBT; Safren & Rogers, 2001), motivational interviewing (MI; Miller & Rollnick, 1991)], particularly within alcohol and drug or gay community health settings (Van Kerteren, Kok, Hospers, Schippers, & DeWildt, 2006). Focussing on this consequence could also be useful for developing strategies to anticipate and plan for possible cognitive difficulties (e.g., staying at home while using).

There are *specific* implications for both *positive* (e.g., enhanced sexual desire, social/emotional facilitation), *negative* (e.g., cognitive impairment) expectancies, and those pertaining to sexual risk-taking and negotiation. Interventions could focus on alternative ways to achieve positive expectations with less harm (e.g., creative means to enhance sex) and by helping MSM to reduce their need for desired consequences (e.g., improve self-esteem to reduce the need to use cannabis for emotional escape).

Cognitive impairment and sexual negotiation appear to be ‘protective factors’ (e.g., those who expect or experience cognitive impairment use less frequently). Health promotion could focus on dispelling myths associated with cannabis (e.g., thinking improves) and reinforcing common harms of relevance to the individual user, and reinforce negative consequences of use. Of note, positive expectancies were more common among recent cannabis users, while negative expectancies were more common among non-recent users. For those who experience difficulties negotiating safe sex could benefit from interventions to increase skills, including improving assertiveness, and self-efficacy to consistently use condoms.

Identifying MSM who use cannabis problematically and engage in sexual risk-taking would be useful for developing prevention strategies. Assessing commonly reported effects of cannabis and considering the direct and indirect effects of substances on sexual risk-taking, and the temporal sequence of use (e.g., prior to sex), may assist with prevention. Additional implications are discussed in relation to the entire program of research in Chapter 9.

### **Limitations and future research.**

Limitations are comprehensively discussed in Chapter 9.

### **Chapter Summary**

A wide range of cannabis use consequences among MSM was identified. Prevention and intervention efforts must consider the variety of cannabis use effects to tailor effective education programs and reduce harm. Findings support the assertion that specific beliefs (e.g., expectancies) regarding substance use influence

subsequent cognitive, emotional and behavioural processes, including sexual activity.

Future research should systematically investigate the role of expectancies in mediating the relationship between substance use and sexual risk-taking. The CEQ-MSM has considerable potential in prevention, health promotion, research and clinical interventions.

## **Chapter 5: Phase 2—Development of the Drinking Expectancy**

### **Questionnaire for Men who have Sex with Men (DEQ-MSM):**

#### **A Measure of Substance-related Beliefs**

#### **Purpose of the Study**

The purpose of this study is consistent with the development of the CEQ-MSM, comprehensively described in Chapter 4.

#### **Introduction**

Consistent with the introduction within Chapter 4, there is a need to advance research pertaining to perceived reinforcement of substance use among MSM. This Chapter will focus on the development of an expectancy measure regarding alcohol among MSM (see Mullens et al., 2011).

#### **Method**

##### **Qualitative.**

*Sample and procedures.* Consistent with the previous methodology for the CEQ-MSM (comprehensively described in Chapter 4), this process revealed 60 outcomes relevant to alcohol (see Appendix B).

##### **Refinement.**

As a result of the refinement process consistent with the CEQ-MSM (comprehensively described in Chapter 4), 11 items were removed. The associated pilot testing resulted in the removal of a further four items.

**Administration.**

The 45-item version of the DEQ-MSM was completed online by a community sample of MSM in Australia (consistent with administration of the CEQ-MSM, see Chapter 4).

**Results****Data analysis.**

Data from the 45-item DEQ-MSM were refined using item analysis statistics. Retained items approximated a normal distribution (kurtosis: -0.70 to 0.70, skewness: -0.75 to 0.75). These 32 items were analysed using principal axis factor analysis. An oblique rotation was selected because it revealed superior simple structure (Kaiser, 1958; Thurstone, 1947), and factors were assumed to be related. Solutions were rotated to direct Oblimin criterion. Items which did not load over 0.40 were not included (see Young & Knight, 1989). The 10 remaining items comprised the revised DEQ-MSM (see Table 9).

**Table 9: Items comprising the DEQ-MSM (including M and SD)**

		<b>M</b>	<b>SD</b>
<b>Factor 1</b>	<b>“Cognitive impairment”</b>		
Item #1	I’m less able to ask for/discuss condoms during sex when drinking	2.33	1.06
Item #3	I become less rational when I’m drinking	3.23	0.99
Item #4	When I’m drinking I’m more forward with possible sexual partners	3.49	0.99
Item #5	Drinking makes it difficult for me to concentrate	3.35	0.98
<b>Factor 2</b>	<b>“Sexual activity”</b>		
Item #2	When I drink my body is more physically sensitive	2.51	0.90
Item #6	Drinking makes my sexual performance better	2.29	0.88
Item #7	Sex is better when I’ve been drinking	2.47	0.98
Item #8	I feel more stimulation during sex when I’m drinking	2.52	1.03
<b>Factor 3</b>	<b>“Social and emotional facilitation”</b>		
Item #9	My mood is better when I’ve been drinking	3.38	1.04
Item #10	I feel more connected with other people when I drink	3.42	0.99

### **Demographics.**

Participants (N = 220) had reported a mean age of 34 years (*SD* = 12.4, range = 18-71). The majority identified as “gay/homosexual” (91.6%), while a small minority identified as “bisexual” (5%), “unsure/undecided” (1.7%), “straight/heterosexual” (0.8%), and “queer” (0.8%). Over half of the sample was single (52%), over half were employed full-time (63%), the majority (82%) lived in an “urban/metro” area (predominantly Brisbane), and the following identified as being: CALD (8.3%), Aboriginal (2.1%) or Torres Strait Islander (0.5%) background. Regarding highest level of education completed, 5% completed Year 10, 36% completed Year 12, 26% completed tertiary adult finishing education or a trade course or certificate, 17% completed some university, 33% were university graduates and 21% completed post-graduate studies.

**Substance use.**

*Lifetime use.* All (100%) used alcohol, 86% tobacco, 77% cannabis, 62% ecstasy, 55% amyl nitrite, 51% amphetamines, 37% cocaine, 32%, prescription medications for recreational purposes (e.g., OxyContin<sup>®</sup>) 31% crystal methamphetamine, 31% LSD, 28% nitrous oxide, 22% ketamine, 21% hallucinogens, and 7% heroin.

*Past three months (of those who reported lifetime use).* Nearly all (93%) used alcohol, 75% tobacco, 52% ecstasy, 43% amyl nitrite, 38% cannabis, 32% prescription medication use recreational purposes (e.g., Viagra<sup>®</sup>), 16% crystal methamphetamine, 15% amphetamines, 7% cocaine, 5% ketamine, 5% hallucinogens, 4% LSD, 3% nitrous oxide, and 2% heroin.

*Recent alcohol use (of those who reported use in the past three months).* Nearly all (95%) used alcohol in the past 30 days, reporting a mean of 11 days use ( $SD = 8.8$ ; range = 1 – 30; Median = 8) of use in the past month, and consuming a mean of 5.6 standard drinks ( $SD = 4.8$ ; range = 0.5 – 32; Median = 4) per occasion.

**Item selection through EFA.**

Factor 1 was labelled “Cognitive impairment” (e.g., “Drinking makes it difficult for me to concentrate”, “I become less rational when I’m drinking”) and accounted for 40% of the total variance. Factor 2 consisted of items regarding “Sexual activity” [e.g., “Sex is better when I’ve been drinking” (negative loading), “I feel more stimulation during sex when I’m drinking” (negative loading)]. This factor accounted for 17% of the total variance. Factor 3 was labelled “Social and emotional facilitation” (e.g., “Drinking makes it difficult for me to concentrate”, “I become less

rational when I'm drinking”) and accounted for 9% of the total variance. The factor analysis pattern matrix is shown in Table 10.

**Table 10: Factor analysis pattern matrix of the DEQ-MSM**

Item	Factor Loadings (3 Factors)		
	1	2	3
35	0.818		
31	0.750		
41	0.519		
34	0.494		
21		-0.860	
18		-0.793	
29		-0.738	
40		-0.603	
11			0.734
13			0.700

*Note. See Table 9 for specific items*

### **Evaluation of Factor Performance: Exploratory Sample**

#### **Predictive validity: Prediction of consumption of alcohol.**

The sample reported using alcohol on a mean of 9.6 occasions ( $SD = 10.4$ ; Median = 8) in the past 30 days and a mean of 5.6 standard drinks ( $SD = 4.8$ ; range = 0.5 – 32; Median = 4) per occasion. This equates to a *typical* consumption (based on sample median) of 32 standard drinks in the past month, and a mean consumption (based on sample mean) of nearly 54 standard drinks in the past month. The analysis examined predictions of consumption (quantity x frequency; QF) with the overall regression equation accounting for 4.8% of the variance in QF of consumption ( $R^2 = 4.80$ ) and was significant [ $F(3, 172) = 2.91, p = .036$ ]. In this analysis, no specific

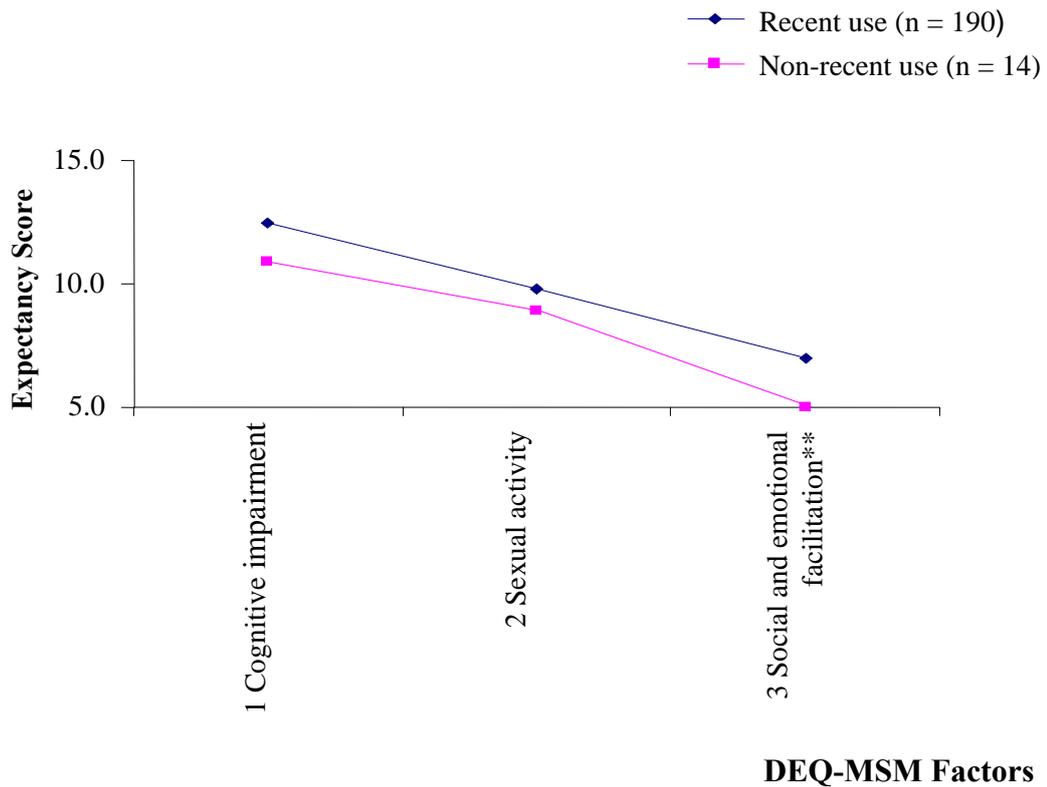
outcome expectancy factors emerged as a significant univariate predictor of consumption (see Table 11), suggesting that the identified reinforcement domains work *together* to influence consumption patterns (i.e., no specific factors are uniquely or independently predictive).

**Table 11: Hierarchical regression analyses with DEQ-MSM factors predicting alcohol use**

<i>R square</i>	0.048				
<i>Model</i>	0.036				
<b>Factor</b>	<b>Beta</b>	<b>Significance</b>	<b>Part Corr</b>	<b>β<sup>2</sup></b>	<b>Factor name</b>
constant		0.336			
1	0.100	0.266	0.083	0.007	Cognitive impairment
2	0.112	0.164	0.104	0.010	Sexual activity
3	0.074	0.404	0.062	0.004	Social and emotional facilitation

**Discriminant validity.**

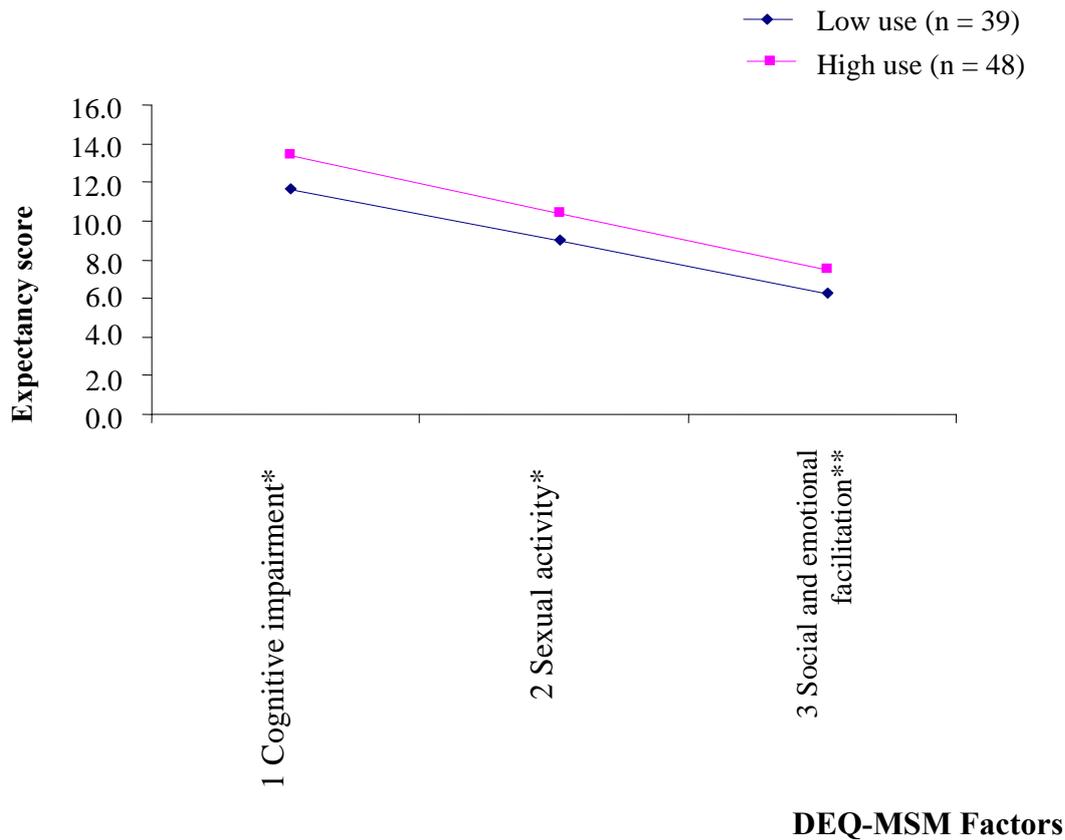
Post-hoc t-tests were conducted to determine if alcohol expectancies predicted alcohol use in the past three months. To test this, the relative strength of expectancy scores across all three factors was compared between recent (i.e., use in the past three months) and non-recent alcohol users (see Figure 4).



Note. \*\*  $p < 0.01$

**Figure 4:** Expectancy scores among recent and non-recent alcohol users

One of the three factor comparisons (Factor 3; “Social and emotional facilitation”) reached a significance of  $p < 0.01$ , while Factor 1 (“Cognitive impairment”;  $p = 0.07$ ) and Factor 2 (“Sexual activity”;  $p = 0.29$ ) did not reach statistical significance. As a further test of discriminant validity (due to the high proportion of recent drinkers), the relative strength of expectancy scores across all three factors was compared between high alcohol users (i.e., QF upper 75%; greater than 32 standard drinks) and low alcohol users (i.e., QF lower 25%; less than 15 standard drinks; see Figure 5).



Note. \*\* $p < 0.01$  and \* $p < 0.05$

**Figure 5:** Expectancy scores among high alcohol users and low alcohol users

Two of the three factor comparisons reached a significance of  $p < 0.01$ , while one comparison reached a significance of  $p < 0.05$ . To further test the specificity of DEQ-MSM expectancy scores to alcohol use, post-hoc t-tests were conducted to test whether or not alcohol expectancies predicted cannabis use and stimulant use in the past three months. The relative strength of expectancy scores across all three factors were compared between recent (i.e., past three months) and non-recent users, for cannabis and stimulants. There were no statistically significant differences for either cannabis ( $p > 0.53$ ) or stimulant use ( $p > 0.57$ ) across all comparisons—indicating that alcohol expectancies were not associated with use of these substances.

### Correlations.

As an additional test of the validity of the factors identified, mean corrected item-total statistics were conducted. The set of final factors developed for the DEQ-MSM were correlated using Pearson's product moment correlations.

**Table 12: Zero-order correlations of the DEQ-MSM factors in the exploratory sample**

Factor	1	2	3
1. Cognitive impairment	---		
2. Sexual activity	0.34	---	
3. Social and emotional facilitation	0.53	0.32	---

Note. \*\* =  $p < 0.01$

Table 12 summarises the zero-order correlations of the factors; the mean correlation within the DEQ-MSM was  $r = 0.40$  (range = 0.32 to 0.53). Correlations between the DEQ-MSM and reported QF of recent alcohol use (i.e., number of standard drinks per occasion x number of days of alcohol use in the past 30 days) were also conducted. The mean between scale correlation was  $r = 0.17$  (range = 0.16 to 0.18; see Table 13).

**Table 13: Zero-order correlations of the DEQ-MSM factors and alcohol use in the past 30 days in the exploratory sample**

Factor	1	2	3
Frequency	0.01	0.09	0.08
Quantity	0.18*	0.18*	0.12
QF	0.18*	0.17*	0.16*

Note. \* =  $p < 0.05$

Further, correlations between the DEQ-MSM and reported quantity of recent alcohol use, and reported frequency of recent alcohol use were conducted separately.

The mean between scale correlation with quantity was  $r = 0.16$  (range = 0.12 to 0.18), while the mean between scale correlation with frequency was  $r = 0.06$  (range = 0.01 to 0.09).

### **Reliability.**

The internal reliability of the three factors was assessed using the Cronbachs' alpha, with an average of  $r = 0.77$  across all three factors. Factor 2 (0.84) demonstrated a high level of internal consistency, and Factor 1 (0.78) demonstrated a good level of internal consistency, while the internal consistency of Factor 3 (0.69) was acceptable. Split-half reliability analyses were also conducted using the Guttman Split-Half coefficient, with an average of  $r = 0.77$  across all factors. Factors 1 (0.80) and 2 (0.82) demonstrated a high level of split-half reliability, and Factor 3 (0.70) demonstrated a good level of split-half reliability.

### **Discussion**

The DEQ-MSM was developed as a culturally appropriate and psychometrically sound measure for MSM of alcohol expectancies, involving members of the gay community in scale design. Factor analysis from this community sample revealed the DEQ-MSM was comprised of three domains of expected reinforcement. Each factor explained a unique percentage of the variance with high internal consistency. The identified domains included "Cognitive impairment", "Sexual activity", and "Social and emotional facilitation". The strength of these factors, along with their relative independence, was confirmed by inter-factor correlational data, calculation of factor loadings, and inter-total

correlations. All factors showed adequate reliability and validity. In summary, the DEQ-MSM appears to be a sound measure of beliefs specific to MSM.

The consequences within each of the factors have face validity—they are thematically related, providing confidence that factors are meaningful. The measure has adequate predictive and discriminant validity. Differences in expectancy scores were distinct between high and low alcohol users (i.e., those with stronger alcohol expectancies showed greater consumption patterns in the previous three months across all three factors), and between recent and non-recent drinkers (i.e., recent drinkers had significantly higher scores for “social and emotional facilitation” than non-drinkers). Comparisons between recent and non-recent drinkers indicated that recent drinkers had higher expectancies regarding “Social and emotional facilitation”—a perceived positive consequence likely to facilitate future drinking experiences. No unique *specific* effects of the DEQ-MSM emerged, which suggests that all three reinforcement domains operate together to influence post-drinking consequences. While the overall model was significant, it only explained a relatively small proportion of the total variance. Social and emotional facilitation may be the most important area to explore in future research, as this factor was associated with recent drinking occasions, but not with alcohol problems.

It was expected that, similar to the CEQ-MSM (Mullens et al., 2010), there would be several distinct consequences specific to MSM (e.g., more adventurous sex; less likely to discuss HIV status). The initial items included in the DEQ-MSM, which were reported by participants (Phase 1) and rated by participants (Phase 2) reflected such distinctions, and included items such as “Anal sex is less painful when I’ve been drinking” and “I’m less likely to discuss my/my partner’s HIV status

during sex when I'm drinking". However, through the standardised psychometric (e.g., removing items which were skewed or kurtotic; see previous research by Young & Knight, 1989) and factor analytic strategies employed, these items were subsequently removed from inclusion in the revised measure. The final version of the DEQ-MSM reflects similarities to reinforcement from drinking reported by members of the general population (e.g., Fromme et al., 1993; Young & Knight, 1989), however the methodological approach taken in the current study ensures that the terminology and ideas reflected are consistent with and relevant to the actual lived experience of MSM.

A recent study by Maisto and colleagues (2010) attempted to test and refine an existing alcohol expectancy measure (see Leigh, 1990) among HIV-infected individuals, and found that the existing measure required modification to be relevant or appropriate for this distinct group. Further only sexual outcomes were included, and it is likely that *both* sexual and non-sexual outcomes impact upon sexual practices (Mullens et al., 2009b) and consumption patterns, and therefore should, both, be included in measures of outcome expectancies among this group. Compared to other limited research on expectancies among MSM (Bimbi et al., 2006; Myers et al., 2004), the DEQ-MSM has been developed a priori in conjunction with members of the target group. Thus, this provides a unique contribution to the existing literature.

### **Implications.**

This study revealed distinct areas of perceived reinforcement secondary to alcohol use among MSM including, cognitive impairment, sexual activity and social and emotional facilitation. Regarding cognitive impairment, it would be useful to

inform MSM about the negative impacts on their thinking and decision-making secondary to use based on their expectancies. This could be incorporated into clinical interventions to help build motivation to reduce or abstain from drinking. Regarding sexual activity (including sexual impairment), educating MSM about the associated side effects of use may help to reduce consumption patterns or avoid sex while under the influence (Mullens et al., 2009b). In addition, helping MSM to understand that drinking in an attempt to be more sociable or improve mood may result in paradoxical effects, and encouraging alternatives to use.

Further, the identification of these consequences of drinking can help to inform future health promotion, HIV prevention, community awareness and research efforts—within gay community, healthcare, and wider societal contexts. For example, gay community campaigns could revisit myths and realities (e.g., excessive alcohol use results in cognitive and sexual impairment) of substance use, and provide education regarding positive (social and emotional facilitation) and negative consequences (cognitive impairment) of drinking. Harm reduction strategies such as encouraging other means to socialise apart from drinking could be employed. Thus, HIV prevention efforts could include educating and empowering men to avoid sex while drinking or consistently engaging in safe sex while under the influence.

It is known that there is social stigma associated with being gay, and that some MSM experience stress associated with being gay directed related to this stigma (Huebner et al., 2002). Some MSM use alcohol and other substances to cope with these stressors (Williams, 2003). Therefore, reducing homophobia, stigma and discrimination within the wider community is also essential to improving the health and wellbeing of MSM, and is likely to result in MSM experiencing less stress

associated with being gay, reduced substance use as a means of coping such stressors, and less reliance on substance-related or sexual venues to feel safe and to socialise. Additional implications are discussed within the entire program of research in Chapter 9.

**Limitations.**

Limitations are comprehensively discussed in Chapter 9.

**Future research.**

Discussed in Chapter 4, and comprehensively discussed across all studies comprising this program of research in Chapter 9.

**Chapter Summary**

This study has identified three main expectancy factors related to alcohol use relevant in this sample of MSM. Prevention approaches may benefit from a stronger consideration of the role of alcohol to achieve social and emotional outcomes. Future research should also systematically investigate the role of expectancies in the development of alcohol use in young gay men. The DEQ-MSM has considerable potential in prevention, health promotion, research and clinical interventions.

## **Chapter 6: Phase 2—Development of the Amyl Nitrite Expectancy**

### **Questionnaire for Men who have Sex with Men (AEQ-MSM):**

#### **A Measure of Substance-related Beliefs**

#### **Purpose of the Study**

The purpose of this study is consistent with the development of the CEQ-MSM, comprehensively described in Chapter 4.

#### **Introduction**

Consistent with the introduction within Chapter 4, there is a need to advance research pertaining to perceived reinforcement of substance use among MSM. This Chapter will focus on the development of an expectancy measure regarding amyl nitrite among MSM (see Mullens et al., *in press*).

Very little is known about reinforcement from inhalants (Siegel et al., 2008), particularly amyl nitrite (French & Power, 1998). MSM experience higher rates of amyl nitrite use (Frankland et al., 2008; Pitts et al., 2006) than the general population. Amyl nitrite use among MSM is commonly associated with sexual practices (French & Power, 1997; 1998; Lampinen et al., 2007; Lange et al., 1988; Slavin, 2001), gay party cultures (Semple, Zians, & Patterson, 2009; Slavin, 2004c), and use in combination with other recreational substances (e.g., Viagra<sup>®</sup>; Chu et al., 2003; Romanelli & Smith, 2004; Slavin, 2001). No known studies have systematically investigated outcome expectancies relevant to amyl nitrite use within any population.

## **Method**

### **Qualitative.**

*Sample and procedures.* Consistent with the methodology (comprehensively described in Chapter 4), this process revealed 47 outcomes relevant to amyl nitrite (see Appendix B).

### **Refinement.**

As a result of the refinement process, consistent with the CEQ-MSM (comprehensively described in Chapter 4), nine items were removed. The associated pilot testing resulted in the removal of a further two items.

### **Administration.**

The 36-item version of the AEQ-MSM was completed online by a community sample of MSM in Australia (consistent with administration of the CEQ-MSM, see Chapter 4).

## **Results**

### **Data analysis.**

Data from the 36-item AEQ-MSM were refined using item analysis statistics. Retained items approximated a normal distribution (kurtosis: -0.70 to 0.70, skewness: -0.75 to 0.75). These 17 items were analysed using principal axis factor analysis. An oblique rotation was selected because it revealed superior simple structure (Kaiser, 1958; Thurstone, 1947), and factors were assumed to be related.

Solutions were rotated to direct Oblimin criterion. Items which did not load over 0.40 were not included (see Young & Knight, 1989). The 16 remaining items comprised the revised AEQ-MSM (see Table 14).

**Table 14: Items comprising the AEQ-MSM (including M and SD)**

		<b>M</b>	<b>SD</b>
<b>Factor 1</b>	<b>“Enhanced sexual desire”</b>		
Item #5	I have stronger sexual desires when using amyl	3.43	1.21
Item #6	When I use amyl my body is more physically sensitive	3.51	1.09
Item #7	I have more adventurous sex when using amyl	3.43	1.25
Item #9	My sexual performance is enhanced when using amyl	3.24	1.11
Item #11	My mood is better when using amyl	2.84	1.12
Item #12	Anal sex is less painful when using amyl	3.57	1.13
Item #13	Sex is better when using amyl	3.52	1.22
Item #15	I’m on a big high when using amyl	3.55	1.06
Item #16	I feel more accepted by others when I use amyl	2.56	1.02
Item #17	When using amyl I feel more horny or sexually aroused	3.66	1.25
<b>Factor 2</b>	<b>“Disorientation”</b>		
Item #4	Interacting with others is more difficult when using amyl	3.04	1.06
Item #10	I feel disoriented when using amyl	3.33	1.20
<b>Factor 3</b>	<b>“Sexual negotiation”</b>		
Item #1	I’m more likely to make bad decisions when I use amyl	2.47	1.07
Item #2	I’m less likely to discuss my/my partner’s HIV status with my partner during sex when using amyl	2.31	1.12
Item #3	I am less likely to ask for/discuss condoms if I’ve been using amyl	2.39	1.20
Item #8	I let sexual partners make decisions for me when using amyl	2.55	1.09
Item #14	I take risks I wouldn’t normally take when using amyl	2.55	1.17

### **Demographics.**

The sample was comprised of 102 MSM (who reported lifetime use of amyl nitrite). Participants reported a mean age of 37 years ( $SD = 12$ , range = 19-71). The majority identified as “gay/homosexual” (91.6%), while a small minority identified as “bisexual” (3.8%), “unsure/undecided” (3%) and “queer” (1.5%), and no participants identified as “straight/heterosexual”. Half of the sample were single

(50%), over half were employed full-time (65%), the majority (84%) lived in an “urban/metro” area (predominantly Brisbane), and the following identified as being: CALD (5%) or Aboriginal (1%). Regarding highest level of education completed, 20% completed Year 10, 32% completed Year 12, 29% completed tertiary adult finishing education or a trade course or certificate, 20% completed some university, 32% were university graduates and 19% completed post-graduate studies.

### **Substance use.**

*Lifetime use.* One hundred percent (100%) used amyl nitrite, 100% alcohol, 89% cannabis, 83% tobacco, 75% ecstasy, 65% amphetamines, 47%, prescription medications for recreational purposes (e.g., OxyContin<sup>®</sup>, Viagra<sup>®</sup>), 46.5% cocaine, 45% crystal methamphetamine, 39% LSD, 37% nitrous oxide, 31% ketamine, 27% hallucinogens, and 10% heroin.

*Past three months (of those who reported lifetime use).* Ninety-six percent (96%) used alcohol, 71% tobacco, 65% ecstasy, 47% amyl nitrite, 43% cannabis, 40% prescription medication use recreational purposes, 26.5% crystal methamphetamine, 19% amphetamines, 9% ketamine, 7% cocaine, 6% hallucinogens, 4% LSD, 4% nitrous oxide, and 3% heroin.

*Recent amyl nitrite use (of those who reported use in the past three months).* Seventy-three percent (73%) used amyl nitrite in the past 30 days, reporting a mean of 6.5 days use ( $SD = 5.6$ ; range = 1 – 24; Median = 5) of use in the past month, and using a mean of 3.2 ‘snorts’ or ‘hits’ ( $SD = 1.7$ ; range = 1-6; Median = 3) per occasion.

**Item selection through EFA.**

Factor 1 was labelled “Enhanced sexual desire” (e.g., “I have stronger sexual desires when using amyl”, “Sex is better when using amyl”) and accounted for 47% of the total variance. Factor 2 consisted of items regarding “Disorientation” (e.g., “I feel disoriented when using amyl”, “Interacting with others is more difficult when using amyl”). This factor accounted for 15% of the total variance. Factor 3 was labelled “Sexual negotiation” [e.g., “I’m less likely to ask for/discuss condoms if I’ve been using amyl” (negative loading), “I’m less likely to discuss my/my partners HIV status when using amyl” (negative loading)] and accounted for 6.5% of the total variance. The factor analysis pattern matrix is shown in Table 15.

**Table 15: Factor analysis pattern matrix for the AEQ-MSM**

Item	Factor Loadings (3 Factors)		
	1	2	3
27	0.904		
17	0.883		
20	0.845		
26	0.800		
7	0.752		
22	0.722		
25	0.711		
15	0.609		
11	0.570		
18	0.401		
24		0.755	
28		0.727	
32			-0.924
35			-0.811
19			-0.712
8			-0.519
1			-0.410

*Note. See Table 14 for specific items*

### **Evaluation of Factor Performance: Exploratory Sample**

#### **Predictive validity: Prediction of amyl nitrite use.**

To test the generality of the findings a regression analysis was conducted. The sample reported using amyl nitrite on a mean of 6.5 occasions ( $SD = 5.6$ ) in the past 30 days and a mean of 3.2 standard ‘snorts’ or ‘hits’ ( $SD = 1.7$ ; range = 1-6) per occasion. The analysis examined predictions of consumption (quantity x frequency; QF) with the overall regression equation accounting for 48.9% of the variance in QF

of consumption ( $R^2 = 4.80$ ) and was significant [ $F(3, 30) = 9.58, p < .000$ ]. In this analysis, the outcome expectancy factors “Enhanced sexual desire” and “Disorientation” emerged as significant univariate predictors of consumption (see Table 16).

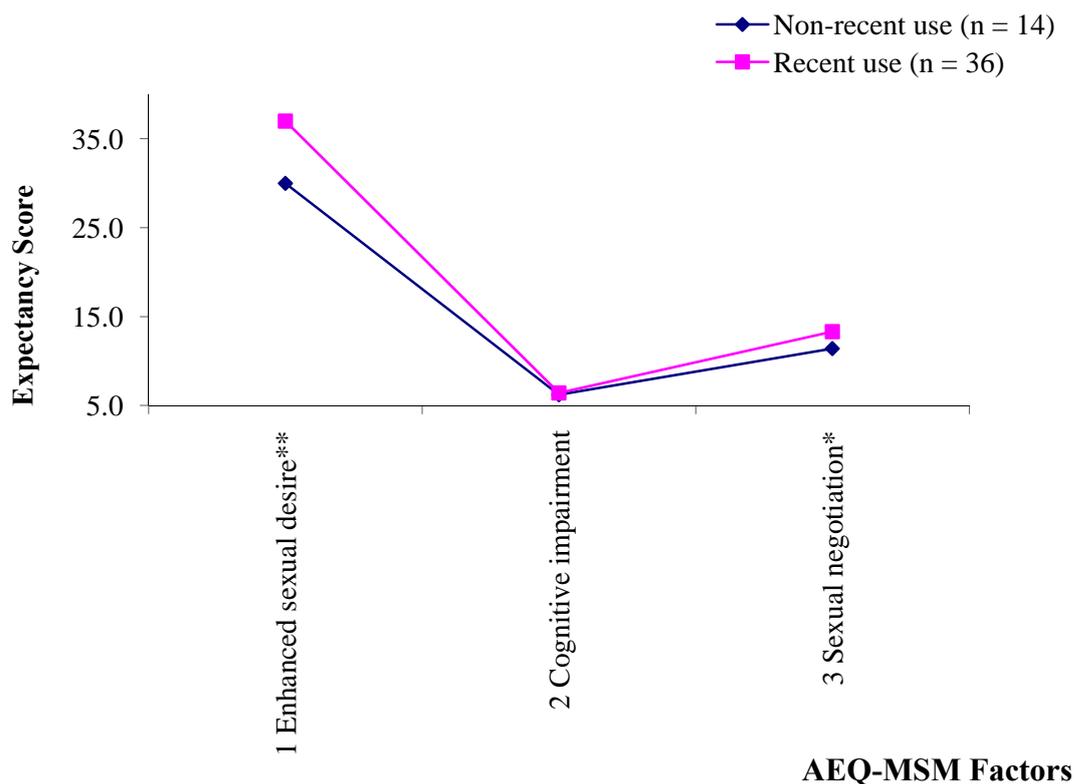
**Table 16: Hierarchical regression analyses with AEQ-MSM factors predicting amyl nitrite use**

<i>R square</i>	<b>0.489</b>				
<i>Model</i>	<b>0.000</b>				
<b>Factor</b>	<b>Beta</b>	<b>Significance</b>	<b>Part Corr</b>	<b><math>\beta^2</math></b>	<b>Factor name</b>
<b>Constant</b>		<b>0.023</b>			
<b>1</b>	<b>0.471</b>	<b>0.007</b>	<b>0.381</b>	<b>0.145</b>	<b>Enhanced sexual desire</b>
<b>2</b>	<b>-0.533</b>	<b>0.001</b>	<b>-0.480</b>	<b>0.230</b>	<b>Disorientation</b>
3	-0.163	0.358	-0.122	0.015	Sexual negotiation

*Note.* Significant predictors are in bold

### **Discriminant validity.**

Post-hoc t-tests were conducted to determine if amyl nitrite expectancies predicted amyl nitrite use in the past three months. To test this, the relative strength of expectancies scores across all three factors was compared between recent (i.e., use in the past three months) and non-recent amyl nitrite users (see Figure 6).



Note. \*\* $p < 0.01$  and \* $p < 0.05$

**Figure 6:** Expectancy scores among recent and non-recent amyl nitrite users

Two of the three factor comparisons were statistically significant: Factor 1 (“Enhanced sexual desire”;  $p < 0.000$ ) and Factor 3 (“Sexual negotiation”;  $p = 0.037$ ). To further test the specificity of AEQ-MSM expectancy scores to amyl nitrite use, post-hoc t-tests were conducted to test whether or not amyl nitrite expectancies predicted alcohol use, cannabis use and stimulant use in the past three months. The relative strength of expectancy scores across all three factors was compared independently between recent (i.e., past three months) and non-recent users, for alcohol, cannabis and stimulants. There were no statistically significant differences for either alcohol ( $p > 0.43$ ) or stimulant use ( $p > 0.67$ ) across all comparisons—indicating that amyl nitrite expectancies were not associated with use of these substances. However, one of the three amyl nitrite expectancies was associated with cannabis use (Factor 2; “Disorientation”;  $p = 0.04$ ).

### Correlations.

As an additional test of the validity of the factors identified, mean corrected item-total statistics were conducted. The set of final factors developed for the AEQ-MSM were correlated using Pearson's product moment correlations.

**Table 17: Zero-order correlations of the AEQ-MSM factors in the exploratory sample**

Factor	1	2	3
1. Enhanced sexual desire	---		
2. Disorientation	0.05	---	
3. Sexual negotiation	0.56**	0.39**	---

Note. \*\* =  $p < 0.01$

Table 17 summarises the zero-order correlations of the factors; the mean correlation within the AEQ-MSM was  $r = \pm 0.33$  (range = 0.05 to 0.56).

Correlations between the AEQ-MSM and reported QF of recent amyl nitrite use (i.e., number of days of amyl nitrite use in the past 30 days x number of 'snorts' or 'hits' per occasion) were also conducted. The mean between scale correlation was  $r = 0.31$  (range = 0.05 to 0.44; see Table 18).

**Table 18: Zero-order correlations of the AEQ-MSM factors and amyl nitrite use in the past 30 days in the exploratory sample**

Factor	1	2	3
Frequency	0.35	-0.57**	-0.10
Quantity	0.41*	0.06	0.14
QF	0.44**	-0.44**	-0.05

Note. \* =  $p < 0.05$ ; \*\* =  $p < 0.01$

Further, correlations between the AEQ-MSM and reported quantity of recent alcohol use, and reported frequency of recent amyl nitrite use were conducted

separately. The mean between scale correlation with quantity was  $r = 0.20$  (range = 0.06 to 0.41), while the mean between scale correlation with frequency was  $r = \pm 0.34$  (range = 0.10 to 0.57).

### **Reliability.**

The internal reliability of the three factors was assessed using the Cronbachs' alpha, with an average of  $r = 0.80$  across all three factors. Factors 1 (0.85) and 3 (0.87) demonstrated a high level of internal consistency, and Factor 2 (0.67) demonstrated an acceptable level of internal consistency. Split-half reliability analyses were also conducted using the Guttman Split-Half coefficient, with an average of  $r = 0.80$  across all factors. Factor 1 (0.91) demonstrated a high level of split-half reliability, Factor 3 (0.73) demonstrated a good level of split-half reliability, and Factor 2 (0.67) was acceptable.

### **Discussion**

The AEQ-MSM was developed as a culturally appropriate and psychometrically sound measure for MSM of amyl nitrite expectancies, and it is the first known measure of its type for this drug. Factor analysis from this community sample revealed the AEQ-MSM was comprised of three domains of expected reinforcement. Each factor explained a unique percentage of the variance with high internal consistency. The identified domains included: "Disorientation", "Enhanced sexual desire", and "Sexual negotiation". The strength of these factors, along with their relative independence, was confirmed by inter-factor correlational data, calculation of factor loadings, and inter-total correlations. All factors showed

adequate reliability and validity. In summary, the AEQ-MSM appears to be a sound measure of beliefs specific to MSM.

The consequences within each of the factors have face validity—they are thematically related, providing confidence that factors are meaningful. The measure has adequate predictive and discriminant validity, although “Disorientation” was predictive of both amyl nitrite and cannabis use, which may be indicative of the impact of these two drugs on the ability to interact with others while under the influence or an artefact of poly-substance use. Correlations indicated sexual negotiation was related to both enhanced sexual desire and disorientation. Further, differences in expectancy scores were distinct between recent and non-recent users for both of the sexual domains (i.e., those with stronger expectancies showed greater consumption patterns in the previous three months), which provides further evidence for the association between amyl nitrite use and sexual activity. Results indicate one positive reinforcement domain (e.g., “Enhanced sexual desire”), one negative reinforcement domain (e.g., “Disorientation”), and one domain labelled sexual negotiation. Two unique *specific* effects (“Enhanced sexual desire” and “Disorientation”) of the AEQ-MSM emerged—“Enhanced sexual desire” was associated with higher usage, while “Disorientation” was associated with lower usage, which may be a *protective* factor. Sexual enhancement may be the most important area to explore in future research, as this factor was significantly associated with recent amyl nitrite use and may be a relevant area to focus on for specific interventions (e.g., encouraging alternative means to increase sexual pleasure and enjoyment without using amyl nitrite).

The AEQ-MSM is the only known amyl nitrite expectancy measure (internationally), to date, and it focuses on a more narrow range of reinforcement than those reported for *other* substances among the general population. The reinforcement domains are strongly related to sexual activity and pleasure (Brown, et al., 1980; Fromme et al., 1993; LaBrie et al., 2002), which is consistent with typical use of amyl nitrite commonly during sexual contexts (French & Power, 1998; Lampinen et al., 2007; Slavin, 2001). Further, compared to limited research on expectancies among MSM, the AEQ-MSM has been developed a priori in conjunction with members of the target group (Bimbi et al., 2006; Mullens et al., 2010; Myers et al., 2004). The need for a measure specific to amyl nitrite is particularly salient due to the unique patterns and contexts of use among gay men (Mullens et al., 2009b; Smith et al., 2004; Prestage 2007a; 2007b). The strong association between substance use, including amyl nitrite, and sexual activity has implications for HIV transmission and health promotion (Colfax et al., 2004; Mullens et al., 2009b; Myers et al., 2004; Parsons et al., 2005).

### **Implications.**

There are *specific* implications for both the *positive* (e.g., sexual enhancement) and *negative* (e.g., disorientation) expectancies identified, as well as relating to sexual risk-taking. Interventions and health promotion regarding positive expectancies could focus on helping MSM to reduce their need for desired consequences (e.g., finding other creative means to enhance sex that do not focus on amyl nitrite use, sexual risk reduction practices such as mutual masturbation instead of UAI). Health promotion could also focus on reinforcing negative consequences of use (e.g., amyl nitrite use makes it difficult to interact with others). Further,

expectancies regarding sexual negotiation were higher among those with recent use. Focusing on, both, reducing use and modifying expectancies could be a useful target in relation to HIV prevention efforts. This may be particularly important because nearly half of the participants reported use in the past month with typical use of one to two times per week, and use of inhalants represents harm in and of itself. Sexual negotiation is the consequence likely to be associated with the greatest harm, particularly as this drug influences cognitive and behavioural processes associated with sexual negotiation. Further, difficulties negotiating safe sex may have developed secondary to low self-worth or poor assertiveness skills. Interventions should focus on improving these deficits and reinforce consistent condom use, and provide education regarding such consequences of use and the associated health risks. Additional implications are discussed in Chapter 9 in relation to the entire program of research.

**Limitations.**

Limitations are comprehensively discussed in Chapter 9.

**Future research.**

Discussed in Chapter 4, and comprehensively discussed across all studies comprising this program of research in Chapter 9. Research should also consider what distinguishes amyl nitrite users from other substance users to determine if sub-cultural aspects of this group may heighten risks, as well as included an increased focus on expectancies and perceived reinforcement associated with poly-substance use. Differences may also exist between consequences of amyl nitrite use versus

other substances, given that the drug is typically used *during* a sexual encounter (and commonly used *after* sexual activity has commenced) rather than prior.

### **Chapter Summary**

This study has identified three main consequences of amyl nitrite use relevant in this sample of MSM. Findings from the current study lend support for the role of specific beliefs (e.g., expectancies) on influencing sexual behaviour post-use. Prevention approaches and interventions may benefit from a stronger consideration of the role of amyl nitrite in achieving sexual outcomes. Future research should also systematically investigate the role of expectancies in mediating the relationship between substance use and sexual risk-taking. The AEQ-MSM has considerable potential in prevention, health promotion, research and clinical interventions.

## **Chapter 7: Phase 2—Development of the Stimulant Expectancy**

### **Questionnaire for Men who have Sex with Men (SEQ-MSM):**

#### **A Measure of Substance-related Beliefs**

#### **Purpose of the Study**

The purpose of this study is consistent with the development of the CEQ-MSM, comprehensively described in Chapter 4.

#### **Introduction**

Consistent with the introductions for Chapters 4-6, there is a need to advance research pertaining to perceived reinforcement of substance use among MSM. This Chapter will focus on the development of an expectancy measure regarding stimulants for MSM.

#### **Method**

##### **Qualitative.**

*Sample and procedures.* Consistent with the methodology (comprehensively described in Chapter 4), this process revealed 60 outcomes relevant to stimulants (see Appendix B).

Refinement.

As a result of the refinement process consistent with the CEQ-MSM (comprehensively described in Chapter 4), 14 items were removed. The associated pilot testing resulted in the removal of a further two items.

**Administration.**

The 44-item version of the SEQ-MSM was completed online by a community sample of MSM in Australia (consistent with administration of the CEQ-MSM, see Chapter 4).

**Results****Data analysis.**

Data from the 44-item SEQ-MSM were refined using item analysis statistics. Retained items approximated a normal distribution (kurtosis: -0.70 to 0.70, skewness: -0.75 to 0.75). These 17 items were analysed using principal axis factor analysis. An oblique rotation was selected because it revealed superior simple structure (Kaiser, 1958; Thurstone, 1947), and factors were assumed to be related. Solutions were rotated to direct Oblimin criterion. Items which did not load over 0.40 were not included (see Young & Knight, 1989). The 16 remaining items comprised the revised SEQ-MSM (see Table 19).

**Table 19: Items comprising the SEQ-MSM (including M and SD)**

		M	SD
<b>Factor 1</b>	<b><i>“Enhanced sexual desire”</i></b>		
Item #1	I’m more likely to go looking for sex when I’ve been using stimulants	4.28	0.82
Item #5	I think a lot more about sex when using stimulants	2.48	1.20
Item #9	I have more adventurous sex when using stimulants	2.94	0.99
<b>Factor 2</b>	<b><i>“Sexual negotiation”</i></b>		
Item #3	I’m more likely to assume the other person is the same HIV status when using stimulants	3.99	0.99
Item #4	I’m less likely to discuss my/my partner’s HIV status with my partner during sex when I’ve been using stimulants	3.10	1.19
Item #6	I can become paranoid or suspicious after using stimulants	3.33	1.04
Item #8	I am less likely to ask for/discuss condoms if I’ve been using stimulants	2.86	1.07
Item #10	When I use stimulants may think unsafe sex is okay at the time	3.58	1.08
Item #13	My judgment can become impaired when using stimulants	3.49	1.21
<b>Factor 3</b>	<b><i>“Cognitive and social facilitation”</i></b>		
Item #12	Conversations are better when using stimulants	3.66	1.12
Item #14	I feel more accepted by others when I use stimulants	3.98	0.77
Item #15	Stimulants make me more outgoing	4.01	0.85
<b>Factor 4</b>	<b><i>“Sexual activity”</i></b>		
Item #2	I feel more stimulation and sensations during sex when I’m using stimulants	2.35	1.25
Item #7	Sex is better when I’ve been using stimulants	3.54	1.25
Item #11	Using stimulants makes sex last longer	3.99	0.79

### Demographics.

The sample was comprised of 112 MSM (who reported lifetime use of stimulants). Participants had a mean of 33 years ( $SD = 10.5$ , range = 18-63). The majority identified as “gay/homosexual” (91.2%), while a small minority identified as “bisexual” (4.8%), “queer” (1.6%), “unsure/undecided” (1.6%), and “straight/heterosexual” (0.8%). Half of the sample were single (50%), over half were employed full-time (63%), the majority (90%) lived in an “urban/metro” area (predominantly Brisbane), and the following identified as being: CALD (8%) or

Aboriginal (1%). Regarding highest level of education completed, 20% completed Year 10, 38% completed Year 12, 23.5% completed tertiary adult finishing education or a trade course or certificate, 20% completed some university, 42% were university graduates and 19% completed post-graduate studies.

### **Substance use.**

*Lifetime use.* All participants (100%) used alcohol, 96% cannabis, 93% ecstasy, 81% tobacco, 78% amyl nitrite, 76% amphetamines, 54.5% cocaine, 51%, prescription medications for recreational purposes (e.g., OxyContin<sup>®</sup>), 48.5% crystal methamphetamine, 43% LSD, 41% nitrous oxide, 35% ketamine, 29% hallucinogens, and 10% heroin.

*Past three months (of those who reported lifetime use).* All participants (100%) used alcohol, 81% tobacco, 70% ecstasy, 49.5% cannabis, 46% amyl nitrite, 38.5% prescription medication use recreational purposes (e.g., Viagra<sup>®</sup>), 24% crystal methamphetamine, 19% amphetamines, 9% cocaine, 8% ketamine, 5% hallucinogens, 5% LSD, 3% nitrous oxide, and 2% heroin.

*Recent stimulant use (of those who reported use in the past three months).* Seventy percent (70%) used any stimulants in the past 30 days, reporting a mean of 3.6 days use ( $SD = 3.0$ ; range = 1 – 15) in the past month. Over a third (38%) reported use of ecstasy in the past month ( $M$  quantity 1.9 pills;  $SD = 1.6$ ; range = 0.5-8 per occasion; Median = 1.0; mean frequency 2.5 days;  $SD = 3.2$ ; range = 1-20; Median = 1.0). One-fifth (20%) reported use of amphetamines ( $M$  quantity 2.3 ‘points’;  $SD = 2.9$ ; range = 1-10 per occasion; Median = 1.0; reporting frequency 2.6 days;  $SD = 4.3$ ; range = 1-20; Median = 1.0). A minority (11%) crystal

methamphetamine (reporting quantity of 2.4 ‘points’;  $SD = 2.5$ ; range = 1-10 per occasion; Median = 1.0; reporting frequency of 3 days;  $SD = 4.5$ ; range = 1-20; Median = 2.0).

### **Item selection through EFA.**

Factor 1 was labelled “Enhanced sexual desire” (e.g., “I am more likely to go looking for sex when I’ve been using stimulants”, “I think a lot more about sex when using stimulants”) and accounted for 38% of the total variance. Factor 2 consisted of items regarding “Sexual negotiation” [e.g., “I’m more likely to assume the other person is the same HIV status if I’ve been using stimulants” (negative loading), “I’m less likely to ask for/discuss condoms when I’ve been using stimulants” (negative loading)]. This factor accounted for 15.5% of the total variance. Factor 3 was labelled “Cognitive and social facilitation” (e.g., “I see things more clearly when I use stimulants”, “I feel more accepted by others when I use stimulants”) and accounted for 9% of the total variance. Factor 4 was labelled “Sexual activity” [e.g., “Sex is better when using stimulants” (negative loading), “I feel more stimulation and sensations during sex when I’m using stimulants” (negative loading)] and accounted for 6.5% of the total variance. The factor analysis pattern matrix is shown in Table 20.

**Table 20: Factor analysis pattern matrix for SEQ-MSM**

Item	Factor Loadings (4 Factors)			
	1	2	3	4
41	0.812			
13	0.784			
37	0.473			
23		-0.941		
18		-0.825		
44		-0.824		
42		-0.808		
22		-0.572		
31		-0.479		
9			0.824	
40			0.439	
14			0.438	
5				-0.998
33				-0.710
17				-0.486

*Note.* See Table 19 for specific items

### **Evaluation of Factor Performance: Exploratory Sample**

#### **Predictive validity: Prediction of stimulant use.**

To test the generality of the findings a regression analysis was conducted with this sample of stimulant users. The sample reported using stimulants on a mean of 3.6 occasions ( $SD = 3.0$ ) in the past 30 days. The analysis examined predictions of consumption (frequency) with the overall regression equation accounting for 29% of the variance in frequency of consumption ( $R^2 = 29.0$ ) and was significant [ $F(4, 31) = 3.16, p = 0.027$ ]. In this analysis, the outcome expectancy “Sexual negotiation” emerged as the only significant univariate predictor of consumption (see Table 21).

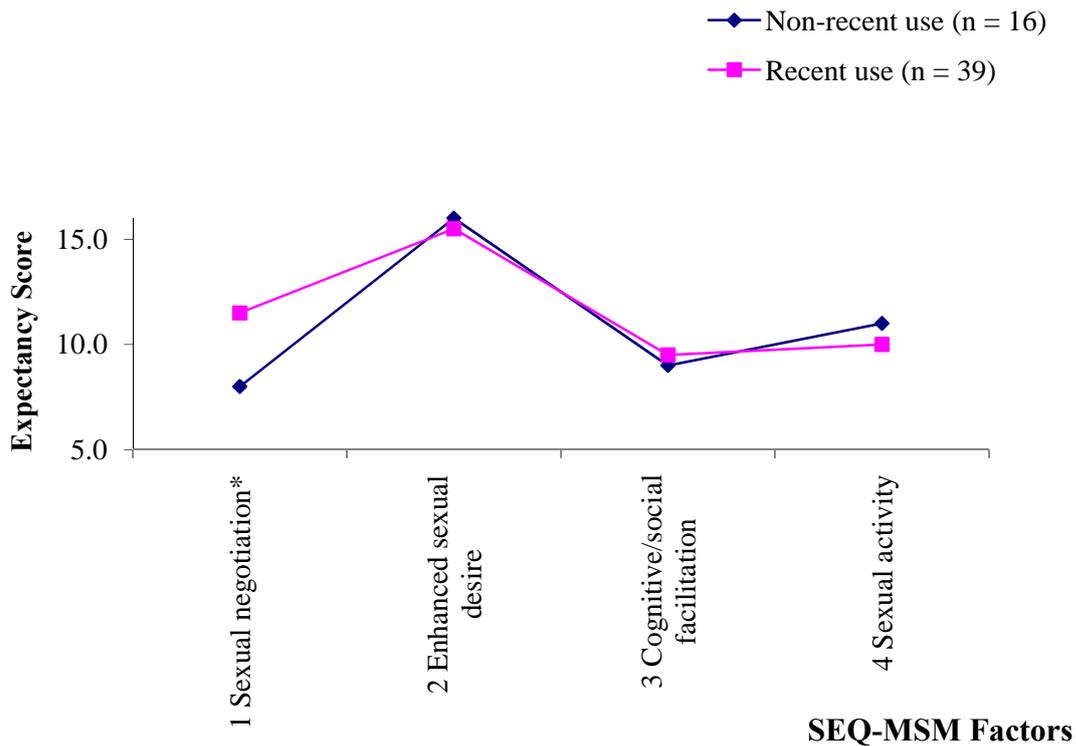
**Table 21: Hierarchical regression analyses with SEQ-MSM factors predicting stimulant use**

<i>R square</i>	<b>0.290</b>				
<i>Model</i>	<b>0.027</b>				
<b>Factor</b>	<b>Beta</b>	<b>Significance</b>	<b>Partial Correlation</b>	<b><math>\beta^2</math></b>	<b>Factor name</b>
Constant		0.241			
1	0.121	0.597	0.081	0.007	Enhanced sexual desire
<b>2</b>	<b>0.419</b>	<b>0.019</b>	<b>0.376</b>	<b>0.141</b>	<b>Sexual negotiation</b>
3	0.165	0.323	0.152	0.023	Cognitive/social facilitation
4	-0.030	0.895	-0.020	0.000	Sexual activity

*Note.* Significant predictors are in bold

### **Discriminant validity.**

Post-hoc t-tests were conducted to determine if stimulant expectancies predicted stimulant use in the past three months. To test this, the relative strength of expectancy scores across all four factors was compared between recent (i.e., use in the past month) and non-recent stimulant users (see Figure 7).



Note. \*  $p < 0.05$

**Figure 7: Expectancy scores among recent and non-recent stimulant users**

One of the four factor comparisons (Factor 3) reached a significance of  $p < 0.01$ , while Factor 1 ( $p = 0.07$ ) and Factor 2 ( $p = 0.29$ ) did not reach statistical significance. To further test the specificity of SEQ-MSM expectancy scores to stimulant use, post-hoc t-tests were conducted to test whether or not stimulant expectancies predicted cannabis use and alcohol use in the past three months. The relative strength of expectancy scores across all three factors were compared between recent (i.e., past three months) and non-recent users, for cannabis and alcohol. There were no statistically significant differences for either cannabis use ( $p > 0.53$ ) or alcohol use ( $p > 0.57$ ) across all comparisons—indicating that stimulants expectancies did not predict use of these other substances.

### Correlations.

As an additional test of the validity of the factors identified, mean corrected item-total statistics were conducted. The set of final factors developed for the SEQ-MSM were correlated using Pearson's product moment correlations.

**Table 22: Zero-order correlations of the SEQ-MSM factors in the exploratory sample**

Factor	1	2	3	4
1. Enhanced sexual desire	---			
2. Sexual negotiation	0.43**	---		
3. Cognitive and social facilitation	0.32**	0.24*	---	
4. Sexual activity	0.72**	0.35**	0.37**	---

Note. \*\* =  $p < 0.01$ ; \* =  $p < 0.05$

Table 22 summarises the zero-order correlations of the factors; the mean correlation within the SEQ-MSM was  $r = 0.40$  (range = 0.24 to 0.72). Correlations between the SEQ-MSM and reported frequency of recent stimulant use (i.e., number of days of stimulant use in the past 30 days) were also conducted. The mean between scale correlation was  $r = 0.35$  (range = 0.27 to 0.50; see Table 23).

**Table 23: Zero-order correlations of the SEQ-MSM factors and frequency of stimulant use in the past 30 days in the exploratory sample**

Factor	1	2	3	4
Frequency	0.33*	0.50**	0.29	0.27

Note. \* =  $p < 0.05$ ; \*\* =  $p < 0.01$

### Reliability.

The internal reliability of the six factors was assessed using the Cronbachs' alpha, with an average of  $r = 0.82$  across all four factors. Factors 1 (0.90), 2 (0.89)

and 4 (0.85) demonstrated a high level of internal consistency, and Factors 3 (0.65) demonstrated an acceptable level of internal consistency. Split-half reliability analyses were also conducted using the Guttman Split-Half coefficient, with an average of  $r = 0.74$  across all factors. Factors 2 (0.86) and 4 (0.82) demonstrated a high level of split-half reliability, Factor 1 (0.75) demonstrated a good level of split-half reliability, and Factor 3 (0.54) demonstrated an acceptable level of split-half reliability.

## **Discussion**

The SEQ-MSM was developed as a culturally appropriate and psychometrically sound measure for MSM. Factor analysis from this community sample revealed the SEQ-MSM is comprised of four salient domains of expected reinforcement. Each of these factors explained a unique percentage of the variance with high internal consistency. The identified domains included “Enhanced sexual desire”, “Sexual negotiation”, “Cognitive and social facilitation”, and “Sexual activity”. The strength of these factors, along with their relative independence, was confirmed by inter-factor correlational data, calculation of factor loadings, and inter-total correlations. All factors showed adequate reliability and validity, and the SEQ-MSM appears to be a sound measure of beliefs specific to MSM.

The consequences within each factor have face validity—they are thematically related, providing confidence that factors are meaningful. The measure has adequate predictive and discriminant validity. Differences in expectancy scores for sexual negotiation were distinct between recent and non-recent stimulant users (i.e., those with higher expectancies regarding sexual risk-taking had used stimulants in the previous three months). Further, sexual negotiation emerged as providing a unique

*specific* effect (e.g., increased sexual risk-taking is associated with higher usage) and has been identified as a particular risk factor regarding consumption.

Compared to other expectancy measures for the general population, the SEQ-MSM has a particular focus on sexual activity and sexual risk-taking (Brown, et al., 1980; Fromme et al., 1993; LaBrie et al., 2002). Compared to other limited research on expectancies among MSM, the SEQ-MSM has been developed a priori in conjunction with members of the target group (Bimbi et al., 2006; Myers et al., 2004), and includes the *range* of stimulants commonly used by this group (Halkitis et al., 2007). Further, compared to one recently developed measure of expectancies relevant to crystal methamphetamine among MSM, the distinct domains of reinforcement identified were more varied and descriptive (Halkitis & Parsons, 2007). This study provides a unique contribution to the existing literature, as no other expectancy measure spanning the range of stimulants commonly used by MSM, to date, has been specifically developed or validated for use among MSM. The need for a culturally relevant measure is particularly salient due to the unique patterns and contexts of substance use among gay men (Mullens et al., 2009b; Smith et al., 2004; Prestage 2007a; 2007b).

The strong associations between substance use and sexual activity has implications for HIV transmission and health promotion (Colfax et al., 2004; Leigh, 1989; Mullens et al., 2009b; Myers et al., 2004; Parsons et al., 2005). For example, those with higher usage of stimulants reported stronger beliefs regarding impacts on sexual negotiation and risk-taking, which is an important focus for clinical interventions and health promotion regarding safe sex.

**Implications.**

There are *specific* implications for both the *positive* (e.g., cognitive and social facilitation; sexual enhancement) and *negative* (e.g., sexual activity, associated with sexual impairment) expectancies identified, as well as relating to sexual risk-taking. Interventions and health promotion regarding positive expectancies could focus on helping MSM to reduce their need for desired consequences (e.g., finding other creative means to enhance sex that do not focus on stimulant use, discussing condom use with sexual partners prior to using stimulants). Health promotion could also focus on dispelling myths associated with stimulant use (e.g., stimulant use enhances sexual performance). Further, expectancies regarding sexual negotiation were higher among those with recent use. Focusing on, both, reducing use and modifying expectancies could be a useful target in relation to HIV prevention efforts. Further, difficulties negotiating safe sex may have developed secondary to low self-worth or poor assertiveness skills. Interventions could focus on improving these deficits and developing skills to consistently negotiate safe sex. Further, it can be argued from the results from the current study that given the role of stimulant use and expectancies regarding sexual risk-taking, treatments aimed at reducing stimulant use can be a form of HIV prevention in and of itself. Additional implications are comprehensively discussed in Chapter 9.

**Limitations.**

Limitations are comprehensively discussed in Chapter 9. Further, stimulants represent an aggregated group of pharmacological agents. This is a useful starting point; however, future research should explore the unique contributions and distinctions among stimulant drugs.

**Future research.**

The current study has allowed for a meaningful advance in relation to understanding the perceived reinforcement across this *class* of substances. Future research should consider what factors contribute to the reported outcomes, such as stigma, discrimination and low self-confidence that may be related to the need for cognitive and social facilitation, low self-worth and poor assertiveness that may be associated with sexual negotiation, and contextual issues associated with substance use and sexual activity. Focussing on improving sexual negotiation skills is also likely to be an important advance. It is also necessary to formally investigate whether expectancies mediate the relationship between substance use and sexual risk-taking, now that an instrument is available to measure such expectancies. Confirmatory factor analysis is required to further test and substantiate the SEQ-MSM.

**Chapter Summary**

This study has identified a broad range of consequences of stimulant use (including amphetamines, crystal methamphetamine, and ecstasy) by this community sample of MSM. Prevention approaches and interventions need to consider the breadth and variety of stimulant use effects in tailoring more effective education programs to reduce associated harm. Findings from the current study lend support for the role of specific beliefs (e.g., expectancies) related to substance use on subsequent cognitive, emotional and behavioural processes, including sexual activity and risk-taking. Future research should also systematically investigate the role of expectancies in mediating the relationship between substance use and sexual risk-

taking. The SEQ-MSM has considerable potential in HIV prevention, health promotion, research and clinical interventions.

**Chapter 8: The Predictive Utility of Substance-related Expectancies,  
Substance Use and Novelty-seeking Personality Characteristics on  
HIV Risk Behaviour among Gay and Bisexual Men**

**Purpose of the Study**

Previous research indicates substantial support for association between substance use and sexual risk behaviour, including UAI. Expectancies and novelty-seeking personality characteristics have been hypothesised as *key* factors underlying both substance use and sexual risk-taking. However, no known studies have examined the relative contributions of these factors and substance use patterns in predicting UAI across the *range* of commonly used substances, with expectancy measures that have been specifically developed for use among MSM. Utilising the SEP-MSM, the relative contributions of substance use, substance-related outcome expectancies and novelty-seeking personality traits were examined in predicting UAI in conjunction with substance use among MSM in Australia. Utilising the SEP-MSM allowed for the distinct contributions of substance use, novelty-seeking and expectancies on UAI to be comprehensively examined across a range of substance types commonly used among MSM. Applications arising from these findings across health promotion, prevention, clinical interventions and research settings are likely to contribute to reducing harm associated with substance use among MSM.

**Introduction**

Substance use has been identified as a salient risk factor for engaging in specific sexual behaviours (e.g., UAI), which carry a heightened risk of HIV transmission. In the absence of a vaccine or ‘cure’ for HIV the primary means of

quelling this epidemic, increased understanding of modifiable factors that contribute to sexual risk behaviours, including promoting safer sexual practices based on these data (Leigh & Stall, 1993, Kalichman & Weinhardt, 2001; Woolf & Maisto, 2010). MSM experience higher rates of substance misuse and poly-substance use than the general population, and report higher rates of *certain* substances (e.g., amphetamines, amyl nitrite, cannabis; Cabaj, 2000, Frankland et al., 2008; Hull et al., 2005, Mattison et al., 2001; Pitts et al., 2006).

There are less normative influences against substance use or misuse within the gay community, and alcohol and other drug use is associated with gay party cultures (Prestage et al., 2007a), more sexually adventurous practices (Smith et al., 2004; Prestage et al., 2007b) and enhancing sexual experiences (Green & Halkitis, 2006). These normative influences can contribute to higher rates of use and misuse (Cabaj, 2000; Herdt, 1997; Knox et al., 1999). Substance use has been paired with contexts (Ostrow, 1996; Slavin, 2004c) such as dance parties (e.g., raves, circuit parties; Lee et al., 2003; Lewis & Ross, 1995; Ross et al., 2003), sexual contact (Halkitis & Parsons, 2002; Mullens et al., 2009b; Semple et al., 2002) and SOPV (Binson et al., 2001; Halkitis & Parsons, 2002).

Limited previous research among MSM has been theoretically driven and has included a *specific* framework to explore the factors that underlie relationships between sexual risk-taking and HIV exposure among MSM (Woolf & Maisto, 2009). The proposed theories which have received limited investigation, to date, among MSM include: alcohol ‘myopia’ theory (Venable et al., 2004), SCT (focusing on simple expectancy theory; Bimbi et al., 2006; Parsons & Bimbi, 2007), “cognitive escape” theory (McKirnan & Ostrow, 1996; McKirnan et al., 2001) and risk-taking

personality characteristics (also referred to as novelty-seeking or sensation seeking; Crawford et al., 2003; Kalichman et al., 1996; 1998; 2002). Each of these implies a functional or strategic use of substances. The two theories which will be investigated in the current study are substance related expectancies and novelty-seeking personality characteristics. These approaches demonstrate the strongest theoretical and evidence base (e.g., Bimbi et al., 2004; LaBrie et al., 2006; Kalichman et al., 1998; 2002), and these factors are likely to operate synergistically to influence consequences post substance use (Bandura, 1986; 1994; Bittner, 1997; Jerome et al., 2009; Leventhal & Schmitz, 2006; Myers et al., 2004; Ostrow, 1996; Semple et al., 2000).

### **Substance-related expectancies.**

According to SCT, individual (e.g., personality, demographics), contextual (e.g., social, environmental) and other key social-cognitive variables (e.g., expectancies, self-efficacy) operate together to influence behaviour (Bandura, 1986; Semple et al., 2000). Expectancies refer to an individual's beliefs about the consequences or effects of a given action (e.g., substance use), which are related to personal experiences, vicarious experiences or an acquired concept about appropriate behaviour (Bandura, 1986; Goldman et al., 1987; Weinhardt et al., 2002). Further, outcome expectancies represent an individual's estimate that a specific behaviour will result in a particular outcome (e.g., "Drinking makes me feel outgoing and friendly"; Young & Knight, 1989), and account for strong predictive power regarding, both, substance use patterns and substance use behaviour (Aarons et al., 2003; Oei & Young, 1987).

It is well known that expectations about the effects of a given substance and the context in which people learn how to use a drug, are likely to significantly impact upon post-use behaviour (Ostrow, 1996). This has been consistently demonstrated among the general population and specific groups (e.g., adolescents, college students; e.g., Derman & Cooper, 1994b; LaBrie et al., 2002; Weinhardt & Carey, 2001). Individuals who believe that substance use will result in particular consequences (e.g., heightened arousal, increased sexual adventurousness) are more likely to experience these consequences, which may in turn directly or indirectly make sexual risk-taking more likely. However, studies specifically investigating relationships between substance-related outcome expectancies and HIV risk behaviour outcomes among MSM are rare (e.g., Bimbi et al., 2004; Halkitis et al., 2007; Kalichman et al., 1998; McKirnan et al., 2001; comprehensively described in Chapter 2).

Attempts to extend research regarding the role of expectancies in understanding the links between substance use and sexual risk-taking are hampered by a lack of expectancy measures specifically developed for MSM that are comprehensive, methodologically sound, psychometrically robust, and relevant and culturally appropriate (Bimbi et al., 2004; Mullens et al., 2010; Peele, 1997; see also Chapter 4 regarding the rationale for the need for expectancy measures specific to MSM). However, recent contributions have included the development of the SEP-MSM for alcohol, amyl nitrite, cannabis and stimulant expectancies (see Mullens et al., 2010; 2011; *in press*), and measures developed by Halkitis and colleagues (2007), Nakamura and colleagues (2009) and Maisto and colleagues (2010; described in Chapter 2).

**Substance related expectancies and risk-taking personality characteristics.**

Referred to as “desire for excitement” (Gold et al., 1991), novelty-seeking or sensation seeking refers to a personality disposition defined as a tendency to prefer risk-taking, exciting, optimal and novel stimulation or arousal (George, Connor, Gullo, & Young, 2010; Kalichman et al., 1994). The relative contributions of *both* expectancies and sensation seeking on sexual behaviour have been examined among the general population and specific groups (e.g., college students) and may synergistically influence post-use outcomes (Brown & Vanable, 2007; Bryant, 2006; Hendershot et al., 2007; Kalichman et al., 2008). Such studies among MSM are rare (Kalichman et al., 1998). Only one known study, to date, has explored the moderating contributions of substance related expectancies *and* sensation seeking personality characteristics on sexual risk-taking among MSM. Kalichman and colleagues (1998) found that sensation seeking predicted sexual risk behaviour (i.e., number of sexual partners) over and above substance use prior to sex. Further, path analyses revealed sensation seeking was related to expectancies, which were in turn related to substance use in conjunction with sex and UAI. Subsequent research has reported similar findings among a cohort of HIV-infected men (Kalichman et al., 2002). This research focused on the *number* of sexual partners as an outcome measure of sexual risk (which may not be as accurate an indicator of likelihood of HIV transmission as are other behaviours such as UAI, and may be correlated with seeking novel sexual situations and partners).

**Model tested.**

This study measured the prevalence of sexual risk-taking behaviours, substance use, substance-related expectancies and novelty-seeking personality traits among

MSM throughout Australia utilising the recently developed SEP-MSM (see Mullens et al., 2010; 2011; *in press*). It has built upon previous work which has: 1) Examined the nature of cognitions that represent the reinforcing consequences of substance use relevant to sexual behaviour among MSM (Mullens et al., 2009); and 2) Extended upon existing SCT to develop relevant tools for measuring expectancies among this group (see Mullens et al., 2010; 2011; *in press*). Based on SCT previous research it was hypothesised that substance use, expectancies and novelty-seeking personality characteristics would provide unique contributions in discriminating those who reported UAI in conjunction with substance use from those who did not. Further, it was anticipated that the relative predictive patterns of factors of interest would vary across substance types.

Thus, the multi-dimensional model tested to predict UAI while under the influence of substances included risk factors (e.g., lower socio-economic status associated with higher novelty-seeking; Lahti, Raikkonen, Ekelund, Peltonen, Raitakari & Keltikangas-Jarvinen, 2006), expectancies, substance use and novelty-seeking (See Figure 1). This study makes a unique contribution to the literature as it examines expectancies across the *range* of substances (alcohol, cannabis, amyl nitrite, stimulants) commonly used by this group, and utilises comprehensive expectancy measures that include both sexual and non-sexual consequences. This research also represents an important advance as it incorporates a measure of risk-taking (TCI-125 NS; Cloninger et al., 1993) which has demonstrated stronger psychometric properties in both personality and clinical research (Deditius-Island et al., 2002; Ono et al., 2002) than other models (e.g., Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993). Much of the recent psychobiological research regarding personality has employed Cloninger's model of personality and questionnaires (e.g.,

Kim et al., 2005; Light et al., 2007). Further, more specific risk-taking measures (e.g., sexual sensation seeking; Kalichman et al., 1994 based on Zuckerman et al., 1964) may not sufficiently capture *general* impulsivity qualities that are related to both substance use and sexual behaviour.

## **Method**

### **Participants.**

Gay and other MSM were recruited through advertisements in GLBT community organisations, gay press and links to respective social media (e.g., Facebook™, Twitter™), establishments frequented by MSM (e.g., SOPV), and via other GLBT networks (e.g., university groups, community e-mail lists). Some participants became aware of the study by previous participants (e.g., snowball sampling). Participants responded to advertisements directly by accessing the online survey. Participants were screened for having a history of alcohol or other drug use and inclusion in the MSM community prior to commencing questionnaires. Participants were excluded if they were under the age of 18.

### **Procedure.**

The online questionnaire took approximately 15 to 30 minutes to complete, and was conducted via an online web link using *SurveyMaker* (Emu Design, Fortitude Valley). The following overview preceded the questionnaire:

Researchers at Queensland University of Technology, in collaboration with members of the gay community and community organisations, have developed this survey to help do something in response to growing concerns about alcohol and drug use among men who have sex with men (MSM). We hope to address some of the health issues that you or your friends may face. This is a NEW survey that builds on a previous project. To put it simply ... we need the help of you and your friends. We are currently seeking input from gay men, bisexual

men and other men who have sex with men (MSM), who are 18 or older. How can you make a difference? Just complete this survey about your experiences with alcohol and/or drugs and their effects. Please complete the survey now, don't wait! This is guaranteed 100% confidential and QUT approved. We do not want to know who you are ... just honest experiences.

Ethics approval was granted through the Human Research Ethics Committee at the Queensland University of Technology. Informed consent was obtained consistent with the procedure discussed in Chapter 4.

### **Measures.**

***Demographics.*** Questions were asked regarding: age, relationship status ("single", "married/defacto with a man", "married/defacto with a woman", "separated", "divorced", "widow", "other—please specify"), employment status ("full-time", "part-time", "self-employed", "unemployed", "pension/benefit", "student", "home duties", "retired", "other"), education (number of years; "less than Year 10", "Finished Year 10", "Finished Year 12", "TAFE course/certificate", "Started university, but did not complete", "University graduate", "Post-graduate studies"), usual occupation and sexual identity ("gay/homosexual", "straight/heterosexual", "bisexual", "unsure", "other—please specify").

***Affiliation with the gay community.*** Participants were asked, "How much of your free time is spent with gay or homosexual men?" (adapted from previous research; e.g., *Gay Community Periodic Survey*, Frankland et al., 2006). This question was rated on a 4-point Likert scale (1 = "none" to 4 = "a lot").

***Substance use.*** Participants were asked about lifetime and recent (e.g., past three months and past month) use of commonly reported substances used among MSM: cannabis, alcohol, amyl nitrite and stimulants (ecstasy, amphetamines and crystal methamphetamine)—including frequency and quantity during the past month,

and typical quantity of use during the past three months. Drinking behaviour was not further defined. Participants were also asked about lifetime and recent use of any other substances.

***Substance-related expectancies.*** Expectancies were assessed using the SEP-MSM (see Table 1), of the CEQ-MSM (Mullens et al., 2010), DEQ-MSM (Mullens et al., 2011), AEQ-MSM (Mullens et al., *in press*) and SEQ-MSM (see Figure 8).

<b>Cannabis (28 items) n = 180 <i>CEQ-MSM</i></b>	<b>Alcohol (10 items) n = 220 <i>DEQ-MSM</i></b>	<b>Amyl nitrite (17 items) n = 102 <i>AEQ-MSM</i></b>	<b>Stimulants (15 items) n = 112 <i>SEQ-MSM</i></b>
Cognitive impairment (4 items)	Cognitive impairment (4)	Disorientation (2)	
Social & emotional facilitation (5)	Social & emotional facilitation (2)		Cognitive & social facilitation (3)
Enhanced sexual desire & mood (4)		Enhanced sexual desire (10)	Enhanced sexual desire (3)
Enhanced sexual experience (6)			
Sexual disinhibition (2)			
	Sexual activity (4)		Sexual activity (3)
Sexual negotiation (7)		Sexual negotiation (5)	Sexual negotiation (6)

**Figure 8: Factors comprising the expectancy measures of the SEP-MSM**

The original SEQ-MSM is comprised of four factors. However, due to an erroneous omission of three items in the online questionnaire version of the current study, a modified, two-factor version (“Sexual enhancement” and “Sexual

negotiation”), derived by specifying a two-factor, oblique rotation) of the SEQ-MSM, was used in the current study.

***Sexual risk behaviour.*** Participants were asked questions about whether they had engaged in any of the following: Lifetime UAI, UAI in the past three months, UAI in conjunction with alcohol or other drug use in the past three months, any anal sex in the past two weeks, UAI in the past two weeks and UAI in conjunction with alcohol or other drug use in the past two weeks. Questions were derived from previous research (e.g., Colfax et al., 2004; Gold et al., 1991; Kalichman et al., 1996; 1998; McKirnan et al., 2001). Given the focus of this research on predictors of sexual behaviour while under the influence of substance use, the most salient outcome variable of interest is UAI in conjunction with alcohol or other drug use in the past two weeks, as UAI accounts for the greatest risk of HIV acquisition among MSM and a recent focus helps to improve accuracy of self-report data (Kingsley, Detels, & Kaslow, 1987). Further, assessing the use of substances in relation to sexual behaviour provided a more precise measurement of the substance use-sexual behaviour relationship, than assessing either behaviour independently over a particular period (Leigh, 1990; Leigh & Stall, 1993).

***Novelty-seeking.*** This construct was assessed using the TCI-125 NS (Cloninger et al., 1993) which has demonstrated strong empirical support (Deditius-Island et al., 2002; Ono et al., 2002).

## **Results**

### **Data analysis.**

*Objective.* The study employed a cross-sectional design based on an anonymous questionnaire and examined the relationships between substance use and psychological variables (e.g., substance related expectancies, novelty-seeking) among MSM, including demographic information (e.g., age, ethnicity, relationship status), on sexual risk behaviour. The survey was completed online by a community sample of MSM throughout Australia. The data analyses commenced with a description of the sample, including demographics, gay affiliation, substance use, sexual behaviour and novelty-seeking. Additional statistical techniques (e.g., correlations, t-tests, chi square) were employed to understand relationships between key predictor variables (e.g., substance use, expectancies and novelty-seeking). Finally, DFA analyses were used to test a model of the relative contributions of substance use, expectancies and novelty-seeking in discriminating those who do or do not engage in UAI while under the influence (See Figure 1).

### **Data screening.**

Prior to analyses all data were screened for valid data ranges and missing values. Missing values were generally minimal and random across participants and measures, and assumptions for multivariate analyses were met (Tabachnick & Fidell, 2007). For participants with minimal missing data (less than 20%) for the SEP-MSM (Phase 2 and 3) and TCI-NS (Phase 3), mean value substitution was used as it did not significantly reduce item variance (Tabachnick & Fidell, 2007). Normative comparisons for the TCI-NS were conducted. In Phase 3, likely due to the lengthy

protocol and participant attrition as the protocol progressed, a proportion (approximately 20-30%, depending on substance type—greater missing data was evident for cannabis and amyl expectancy measures as they appeared later in the questionnaire protocol) of participants did not complete all measures. Further, approximately half of the total sample (53%) endorsed any anal sex in the past two weeks (primary outcome variable). Thus, DFA analyses reflect participants' data that were *complete* for the variables of interest (e.g., any anal sex in the past two weeks, SEP-MSM questionnaires).

### **Demographics.**

Participants ( $N = 277$ ) reported a mean age of 36 years ( $SD = 16.5$ , range = 18-82). The majority identified as “gay/homosexual” (88%), while 9.5% “bisexual”, 1.5% “straight/heterosexual”, and 0.7% as “unsure/undecided”. Approximately half were single (52%), over half were employed full-time (59%), the majority (80%) lived in an “urban/metro” area (predominantly Sydney, Melbourne and Brisbane), and the following identified as being: CALD (13%) or Aboriginal (1.2%). Regarding highest level of education completed, 26% completed Year 10, 39% completed Year 12, 28% completed tertiary adult finishing education or a trade course or certificate, 16% completed some university, 31% were university graduates and 20% completed post-graduate studies. The following resided in Queensland (60%), New South Wales (24%), Victoria (11%), Western Australia (2%), ACT (1%), South Australia (1%), and Tasmania (0.4%).

**Gay community affiliation.**

When asked how much time they spend with gay or homosexual men, nearly half (43.5%) reported “a lot”, while 27.5 % reported “some”, 27.5 % “a little”, and 1.5% “none”.

**Substance use.**

*Lifetime use.* Nearly all (99%) used alcohol, 76% cannabis, 71% ecstasy, 70% amyl nitrite, 70% tobacco, 60% amphetamines, 60%, prescription medications for recreational purposes (e.g., OxyContin<sup>®</sup>), 54% cocaine, 46% LSD, 36% crystal methamphetamine, 34% ketamine use, 29% nitrous oxide, 28% hallucinogens, and 7% heroin.

*Use in the past three months (of those who reported lifetime substance use).*

Most (93%) used alcohol (reporting a mean quantity of 2.6 standard drinks;  $SD = 3.4$ ; range = 1-30 per occasion), 88% ecstasy (reporting a mean quantity of 1.8 pills;  $SD = 2.1$ ; range = 1-13 “per occasion”; as defined by the participant), 66% tobacco, 55% prescription medication use recreational purposes, 47% amyl nitrite (reporting a mean quantity of 3.2 ‘hits’;  $SD = 3.7$ ; range = 1-20 per occasion), 41% cannabis (reporting a mean quantity of 3.7 THC units;  $SD = 5.0$ ; range = 1-30 per occasion), 29% amphetamines (reporting a mean quantity of 3.3 ‘points’;  $SD = 3.1$ ; range = 1-10 per occasion), 27% crystal methamphetamine (reporting a mean quantity of 1.7 ‘points’;  $SD = 1.3$ ; range = 1-5 per occasion), 26% cocaine, 8% LSD, 6% ketamine, 4% nitrous oxide, 1.6% heroin, and 1% hallucinogens.

*Use in the past month (of those who reported use in the past three months).*

Ninety-five percent used alcohol in the past 30 days, reporting a mean of 13.7 days

( $SD = 10.8$ ; range = 1-30) of use in the past month, reporting a mean of 4.0 standard drinks ( $SD = 5.6$ ; range = 1-50) per occasion. The majority (80.5%) used amyl nitrite in the past 30 days, reporting a mean of 6.5 days ( $SD = 7.2$ ; range = 1-30) of use in the past month, reporting a mean of 5.5 ‘hits’ ( $SD = 8.5$ ; range = 1-50) per occasion. Approximately two-thirds (69%) used cannabis in the past 30 days, reporting a mean of 12 days ( $SD = 12$ ; range = 1-30) of use in the past month, reporting a mean of 4.5 THC units ( $SD = 5.5$ ; range = 1-30) per occasion. A quarter (26%) used *any* stimulants (amphetamines, crystal methamphetamine or ecstasy) in the past 30 days—23% used ecstasy, reporting a mean of 2.4 days ( $SD = 3.3$ ; range = 1-20) and 1.8 pills ( $SD = 2.0$ ; range = 1-13) per occasion, 6% used crystal methamphetamine reporting a mean of 2.9 days ( $SD = 4.5$ ; range = 1-20) and 3.0 points ( $SD = 4.4$ ; range = 1-19) per occasion, and 4% used amphetamines reporting a mean of 2.5 days ( $SD = 4.3$ ; range = 1-10) and 2.3 points ( $SD = 2.9$ ; range = 1-10) per occasion.

### **Sexual risk behaviour.**

Sexual risk behaviour was assessed both over the last three months and the last three weeks. The majority (90%) of participants reported lifetime UAI, and of those who reported lifetime UAI 63% reported UAI in the past three months. Over half (63%) reported using alcohol or other drugs before or during sex in the past three months, and of those, 59% reported engaging in UAI after using alcohol or other drugs in the past three months. In terms of more recent behaviour, approximately half (53%) reported any anal sex in the past two weeks, and of those, 64% reported UAI in the previous two weeks. Of those reporting UAI in the past two weeks (49%), reported that they had used alcohol or other drugs before or during sex,

indicating that substance use associated with unprotected sexual behaviour was common.

### **Novelty-seeking.**

The mean score for the TCI-125 NS was 10.54 (SD = 2.48; range = 2 to 19). These values are higher than norms reported for a recent sample of adult males ( $M = 9.80$ ;  $SD = 4.56$ ; Smith, Duffy, Stewart, Muir, & Blackwood, 2005).

### **Are expectancies associated with consumption patterns?**

Correlations were conducted between consumption patterns (typical quantity and frequency for all substances, and QF for alcohol in the past month) of alcohol, amyl nitrite, cannabis and stimulants with the respective expectancy scale total score and factor scores. Those which reached significance for cannabis were quantity with CEQ-MSM total score ( $r = 0.317$ ;  $p = 0.013$ ) and Factor 1 (“Enhanced sexual experience”;  $r = 0.299$ ;  $p = 0.019$ ), and frequency with Factor 6 (“Sexual disinhibition”;  $r = -0.294$ ;  $p = 0.05$ ), and for amyl nitrite were quantity with AEQ-MSM total ( $r = 0.317$ ;  $p = 0.013$ ) and Factor 1 (“Sexual enhancement”;  $r = 0.299$ ;  $p = 0.019$ ).

T-tests were used to examine differences and similarities in reported expectancies between recent (past month) users and non-users of respective substances. Use of cannabis was associated with significantly lower scores on the CEQ-MSM Factor 2 (“Sexual negotiation”;  $p = 0.04$ ) and Factor 3 (“Cognitive impairment”). Use of crystal methamphetamine ( $p = 0.003$ ) and ecstasy ( $p = 0.037$ ) was associated with higher SEQ-MSM total score, and ecstasy use was also

associated with significantly lower score on the SEQ-MSM Factor 1 (“Sexual enhancement”;  $p = 0.032$ ).

### **Is UAI associated with consumption patterns?**

Correlations were conducted between substance use in the past month and UAI in conjunction with alcohol and drug use in the past two weeks (NB: A shorter recall period regarding sexual activity was included to increase accuracy of these data). Those which reached significance were QF for alcohol ( $r = 0.247$ ;  $p = 0.007$ ) and frequency of stimulant use ( $r = 0.342$ ;  $p = 0.029$ ).

T-tests were used to examine differences and similarities in reported UAI with regard to substance use. Greater consumption patterns in the past month for alcohol (QF;  $p = 0.006$ ), ecstasy (frequency;  $p = 0.020$ ) and any stimulant use (frequency;  $p = 0.002$ ) were associated with UAI in the past two weeks in conjunction with alcohol or other drugs. No differences were noted for cannabis, amyl nitrite, crystal methamphetamine or amphetamines ( $ps > 0.132$ ).

Chi square analyses were used to test whether or not those who reported recent substance use also reported higher rates of sexual activity (i.e., substance use in conjunction with UAI in the past two weeks). Higher than expected rates of substance use in conjunction with UAI in the past two weeks were evident for those who reported recent use (past month) of crystal methamphetamine ( $X^2$  df (1) = 3.93;  $p = 0.047$ ), ecstasy ( $X^2$  df (1) = 10.74;  $p = 0.001$ ) and any stimulants ( $X^2$  df (1) = 11.18;  $p = 0.001$ ), and for those who drank alcohol at rates higher than the National Health and Medical Research guidelines (e.g., less than 85 standard drinks per month; Commonwealth of Australia, 2009;  $X^2$  df (1) = 6.53;  $p = 0.011$ ).

**Are expectancies associated with UAI?**

Correlations were conducted between each of the four expectancy total and factor scores with questions regarding UAI in conjunction with alcohol and drug use in the past two weeks. Those which reached significance were: DEQ-MSM total ( $p = 0.001$ ;  $r = 0.278$ ), Factor 2 (“Sexual activity”;  $p = 0.001$ ;  $r = -0.292$ ) and Factor 3 (“Social and emotional facilitation”;  $p = 0.015$ ;  $r = 0.210$ ); CEQ-MSM total ( $p = 0.022$ ;  $r = 0.226$ ) and Factor 4 (“Social and emotional facilitation”;  $p = 0.013$ ;  $r = 0.245$ ); AEQ-MSM Factor 1 (“Enhanced sexual desire”;  $p = 0.003$ ;  $r = 0.232$ ); and SEQ-MSM Factor 1 (“Sexual enhancement”;  $p = 0.04$ ;  $r = 0.224$ ).

Those who reported any UAI in the past two weeks in conjunction with alcohol or other drugs reported significantly higher scores on DEQ-MSM Factor 2 (“Sexual activity”;  $p = 0.001$ ), Factor 3 (“Social and emotional facilitation”;  $p = 0.015$ ), and the total score ( $p = 0.001$ ), CEQ-MSM Factor 1 (“Enhanced sexual experience”;  $p = 0.002$ ) and total score ( $p = 0.02$ ), and SEQ-MSM Factor 1 (“Sexual enhancement”;  $p = 0.042$ ). There were no statistically significant differences for amyl nitrite.

**Associations between novelty-seeking and substance use, expectancies and UAI.**

To examine any possible association between novelty-seeking personality characteristics and other predictor variables, correlations were conducted between novelty-seeking and substance use [typical quantity in the past month, and frequency for amyl nitrite, cannabis, stimulants in the past month and QF for alcohol in the past month, total and factor expectancy scores for the four expectancy questionnaire, and sexual risk behaviour (substance use in conjunction with UAI in the past two weeks)]. Correlations were significant between novelty-seeking and DEQ-MSM

total ( $r = 0.191$ ;  $p = 0.003$ ) and Factor 2 (“Sexual activity”;  $r = 0.199$ ;  $p = 0.002$ ) and Factor 3 (“Social and emotional facilitation”;  $r = 0.211$ ;  $p = 0.001$ ) scores, AEQ-MSM total ( $r = 0.212$ ;  $p = 0.006$ ) and Factor 1 (“Enhanced sexual desire”;  $r = 0.171$ ;  $p = 0.029$ ) and Factor 3 (“Sexual negotiation”;  $r = 0.186$ ;  $p = 0.018$ ) scores. There were no significant associations with substance use or UAI. Further, despite novelty-seeking not being independently associated with the outcome variable (UAI while under the influence), previous research (e.g., Crawford et al., 2003; Dolezal et al., 1997; Dudley et al., 1997; Kalichman et al., 1996) supports the inclusion of this variable in the model to be tested, which is consistent with multivariate statistical guidelines (see Tabachnick & Fidell, 2007).

### **Predicting UAI based on hypothesised model.**

*Discriminant function analysis (DFA).* DFA was selected as an appropriate statistical technique over other related multivariate methods (e.g., logistic regression) due to considerations regarding sample size (Tabachnick & Fidell, 2007). Despite having a total sample size of 277 participants in the current study, results from the previous phase of research (see Chapters 4 to 7) suggest that subsamples of users of each of the four distinct substances classes were likely to be significantly smaller, and of those who endorsed the primary outcome variable (i.e., UAI in conjunction with substance use in the previous two weeks) subsamples would be expected to be further modest. Logistic regression analyses would require a minimum subsample size of 120 participants for each of the four substance types to achieve adequate statistical power to evaluate the contributions of the *three* key variables of interest (i.e., substance use, substance-related outcome expectancies and novelty seeking personality traits; see Hsieh, Block, & Larson, 1998; Long, 1997; Peduzzi, Concato,

Kemper, Holford, & Feinstein, 1996). Subsamples in the current study ranged between 117 and 32 across the four substance types with regard to evaluating the primary outcome variable. Thus, a more conservative statistical technique (i.e., DFA) was required to test the hypothesised model across each of the four substance types under investigation.

To test for possible confounding variables in the DFA, comparisons were made between the outcome variable (UAI in conjunction with substance use in the past two weeks) and demographic variables and gay affiliation. There were no statistically significant differences. Thus, these factors were not included (controlled for) in the DFA. For each substance type, DFA were used to determine the significance of the overall fit of the models tested regarding the hypothesised predictive factors (substance use, expectancies and novelty-seeking personality characteristics) in discriminating MSM who reported UAI in conjunction with substance use in the past two weeks from those who did not. Across each of the comparisons by substance type (alcohol, amyl nitrite, cannabis, stimulants) comparisons included: 1) expectancy scores (total and factor for the corresponding expectancy measure); 2) patterns of substance use (QF for alcohol and frequency for amyl nitrite, cannabis, stimulants in the past month); and 3) novelty-seeking.

Each of the models, which provided a statistically significant fit, was examined in turn by substance type, in relation to both the overall model and the significant contributing variables (see Table 24).

**Table 24: DFA significance values for comparisons by substance type****Expectancy total score**

	<i>Use-past month<sup>1</sup></i>
Alcohol	$p < 0.0001^{**}$
Amyl nitrite	$p = 0.297$
Cannabis	$p = 0.149$
Stimulants	$p = 0.046^*$

**Expectancy factor scores**

	<i>Use-past month<sup>1</sup></i>
Alcohol	$p < 0.0001^{**}$
Amyl nitrite	$p = 0.548$
Cannabis	$p = 0.740$
Stimulants (any)	$p = 0.089$

Note. <sup>1</sup>Substance use in the past month is measured by *QF* for alcohol and frequency for other substances

The substance types that reached statistical significance for models tested included alcohol and stimulants (see Table 25).

**Table 25: DFA statistical data for significant model comparisons for alcohol and stimulants**

<b>Alcohol</b>									
<i>P</i>	<i>Wilks Lambda</i>	<i>X<sup>2</sup></i>	<i>df<sup>^</sup></i>	<i>Canonical Correlation</i>	<i>% Variance</i>	<i>% Correct Classification**</i>	<i>Expectancies*</i>	<i>Alcohol Use*</i>	<i>Novelty Seeking*</i>
< 0.0001	0.829	21.55	2	0.413	17.1%	67.8%	sig. <sup>a</sup>	sig.	n.s.
< 0.0001	0.857	17.46	4	0.378	14.3%	66.1%	sig (2, 3) <sup>b</sup>	sig.	n.s.

*Note.* \*Predictive contributors to the model: factors which had loadings over 0.400 (= X)  
 \*\*Percent that were correctly classified  
<sup>^</sup>Degrees of freedom  
<sup>a</sup>DEQ-MSM total score  
<sup>b</sup>DEQ-MSM factor score

<b>Stimulants</b>									
<i>P</i>	<i>Wilks Lambda</i>	<i>X<sup>2</sup></i>	<i>df<sup>^</sup></i>	<i>Canonical Correlation</i>	<i>% Variance</i>	<i>% Correct Classification**</i>	<i>Expectancies*</i>	<i>Alcohol Use*</i>	<i>Novelty Seeking*</i>
0.046	0.803	8.00	3	0.444	19.7%	70.0%	sig.	sig.	n.s.

*Note.* \*Predictive contributors to the model: factors which had loadings over 0.400 (= X)  
 \*\*Percent that were correctly classified  
<sup>a</sup>SEQ-MSM total score

No models were significant for cannabis or amyl nitrite. Tables 26 to 31 provide further detail regarding the significant models.

Further, a formula for predicting UAI in conjunction with substance use has been provided. Despite a total sample of nearly 300 participants, data regarding the predictor and primary outcome variables of interest (e.g., any anal sex in the past two weeks) for testing each substance type under investigation in the DFA were *complete* for the following: alcohol (n = 117); stimulants (n = 85); amyl (n = 43); and cannabis (n = 32). The sample size did not permit making separate comparisons

across distinct stimulant subtypes (crystal methamphetamine, ecstasy, amphetamines).

*Predicting UAI based on alcohol use (QF in the past month), expectancies (total score) and novelty-seeking.* Scores on patterns of DEQ-MSM total score and alcohol use provided differential reports of reported UAI in conjunction with substance use in the past two weeks, while novelty-seeking did not.

**Table 26: Mean values (standard deviations) and ANOVA results for DFA model: Alcohol (QF past in the month), expectancy total score and novelty seeking**

Variable	UAI in conjunction with substance use - yes	UAI in conjunction with substance use - no	F
DEQ-MSM (total)	31.83 (4.40)	28.42 (5.85)	12.71 ( $p = 0.001$ )
Alcohol	67.88 (99.04)	29.02 (32.52)	7.83 ( $p = 0.006$ )
NS	10.99 (2.59)	10.31 (2.61)	2.00 ( $p = 0.160$ )

*Note.* During the past two weeks

Table 26 presents a summary of the univariate and bivariate analyses. Multivariate analysis revealed a significant difference between the two groups ( $F = 12.71$ ,  $X^2(2) = 21.55$ ,  $p = 0.000$ ), with an  $R^2$ -canonical = 0.413 (accounting for 17.1% of the between group variance), and 67.8% correct re-classification.

**Table 27: Standardised canonical coefficients and structure weights from the DFA model: Alcohol (QF in the past month), expectancy total score and novelty seeking**

Variable	Standardised Coefficients	Structure Weights
DEQ-MSM (total)	0.775	0.710
Alcohol	0.672	0.558
NS	0.263	0.282

*Note.* Variables are listed in descending order as per structure weights.

Table 27 shows the standardised canonical coefficients and the structure weights, revealing that expectancy total score and alcohol use contributed to the multivariate effect, while DEQ-MSM total score and alcohol use were predictive contributors (structure matrix loading > 0.400) to the model. The following formula can be used to calculate a discriminant function (DF) score for an individual:  $DF = (0.775 \times \text{DEQ-MSM total score}) + (0.672 \times \text{QF alcohol in the past month}) + (0.263 \times \text{novelty-seeking score})$ . If the DF score of an individual is closer to 0.450 (or above the cut score of -0.013) they are more likely to report UAI in conjunction with substance use in the past two weeks.

*Predicting UAI based on alcohol use (QF in the past month), expectancies (factor scores) and novelty-seeking.* Scores on patterns of DEQ-MSM Factor 2 (“Sexual activity”) and Factor 3 (“Social and emotional facilitation”) scores and alcohol use provided differential reports of reported UAI in conjunction with substance use in the past two weeks, while Factor 1 (“Cognitive impairment”) and novelty-seeking did not.

**Table 28: Mean values (standard deviations) and ANOVA results for DFA model: Alcohol (QF in the past month), expectancy factor scores and novelty seeking**

Variable	UAI in conjunction with substance use - yes	UAI in conjunction with substance use - no	F
DEQ-MSM F1	13.87 (2.58)	13.01 (2.66)	3.19 ( $p = 0.077$ )
DEQ-MSM F2	11.27 (2.82)	9.55 (3.12)	9.66 ( $p = 0.002$ )
DEQ-MSM F3	6.68 (1.58)	5.86 (1.96)	6.30 ( $p = 0.013$ )
Alcohol	67.88 (99.04)	29.02 (32.52)	7.83 ( $p = 0.006$ )
NS	10.99 (2.59)	10.31 (2.61)	2.00 ( $p = 0.160$ )

*Note.* During the past two weeks

Table 28 presents a summary of the univariate and bivariate analyses.

Multivariate analysis revealed a significant difference between the two groups ( $l = . - 857, X^2(4) = 17.46, p = 0.000$ ), with an  $R^2$ -canonical = 0.378 (accounting for 14.3% of the between group variance), and 66.1% correct re-classification.

**Table 29: Standardised canonical coefficients and structure weights from the DFA model: Alcohol (QF in the past month), expectancy factor scores and novelty seeking**

Variable	Standardised Coefficients	Structure Weights
DEQ-MSM F2	0.485	0.612
Alcohol	0.674	0.551
DEQ-MSM F3	0.356	0.494
DEQ-MSM F1	0.248	0.351
NS	0.248	0.278

*Note.* Variables are listed in descending order as per structure weights.

Table 29 shows the standardised canonical coefficients and the structure weights, revealing that Factor 2 score and alcohol use contributed to the multivariate effect, and DEQ-MSM Factor 2 score and alcohol use were predictive contributors (structure matrix loading > 0.400) to the model. The following formula can be used to calculate a DF score for an individual:  $DF = (0.674 \times \text{QF alcohol past month}) + (0.485 \times \text{DEQ-MSM Factor 2}) + (0.356 \times \text{DEQ-MSM Factor 3}) + (0.248 \times \text{DEQ-MSM Factor 2}) + (0.248 \times \text{novelty-seeking})$ . If the DF score of an individual is closer to 0.456 (or above the cut score of -0.016) they are more likely to report UAI in conjunction with substance use in the past two weeks.

***Predicting UAI based on stimulant use (frequency in the past month), expectancies (total score) and novelty-seeking.*** Scores on patterns of stimulant use provided differential reports of reported UAI in conjunction with substance use in the

past two weeks, while SEQ-MSM total score was borderline ( $p = 0.053$ ) and novelty-seeking did not.

**Table 30: Mean values (standard deviations) and ANOVA results for DFA model: Stimulants (frequency in the past month), expectancy total score and novelty seeking**

Variable	UAI in conjunction with substance use - yes	UAI in conjunction with substance use - no	F
SEQ-MSM (total)	34.47 (7.19)	29.09 (5.85)	43.99 ( $p = 0.053$ )
Stimulants	4.14 (4.29)	1.27 (1.35)	4.66 ( $p = 0.037$ )
NS	10.59 (2.75)	10.22 (3.81)	0.116 ( $p = 0.735$ )

*Note.* During the past two weeks

Table 30 presents a summary of the univariate and bivariate analyses. Both expectancy total score and stimulant use produced significant differences between the groups. Multivariate analysis revealed a significant difference between the two groups ( $\lambda = 0.803$ ,  $X^2(3) = 8.00$ ,  $p = 0.046$ ), with an  $R^2$ -canonical = 0.444 (accounting for 19.7% of the between group variance), and 70% correct re-classification.

**Table 31: Standardised canonical coefficients and structure weights from the DFA model: Stimulants (frequency in the past three months), expectancy total score and novelty seeking**

Variable	Standardised Coefficients	Structure Weights
Stimulants	0.768	0.708
SEQ-MSM (total)	0.708	0.655
NS	-0.065	0.112

*Note.* Variables are listed in descending order as per structure weights.

Table 31 shows the standardised canonical coefficients and the structure weights, revealing that SEQ-MSM total score and stimulant use contributed to the multivariate effect, and expectancy total score and stimulant use were predictive

contributors (structure matrix loading > 0.400) to the model. The following formula can be used to calculate a DF score for an individual:  $DF = (0.768 \times \text{frequency of stimulants in the past month}) + (0.708 \times \text{SEQ-MSM total}) + (-0.065 \times \text{novelty-seeking})$ . If the DF score of an individual is closer to 0.297 (or above the cut score of -0.243) they are more likely to report UAI in conjunction with substance use in the past two weeks.

## Discussion

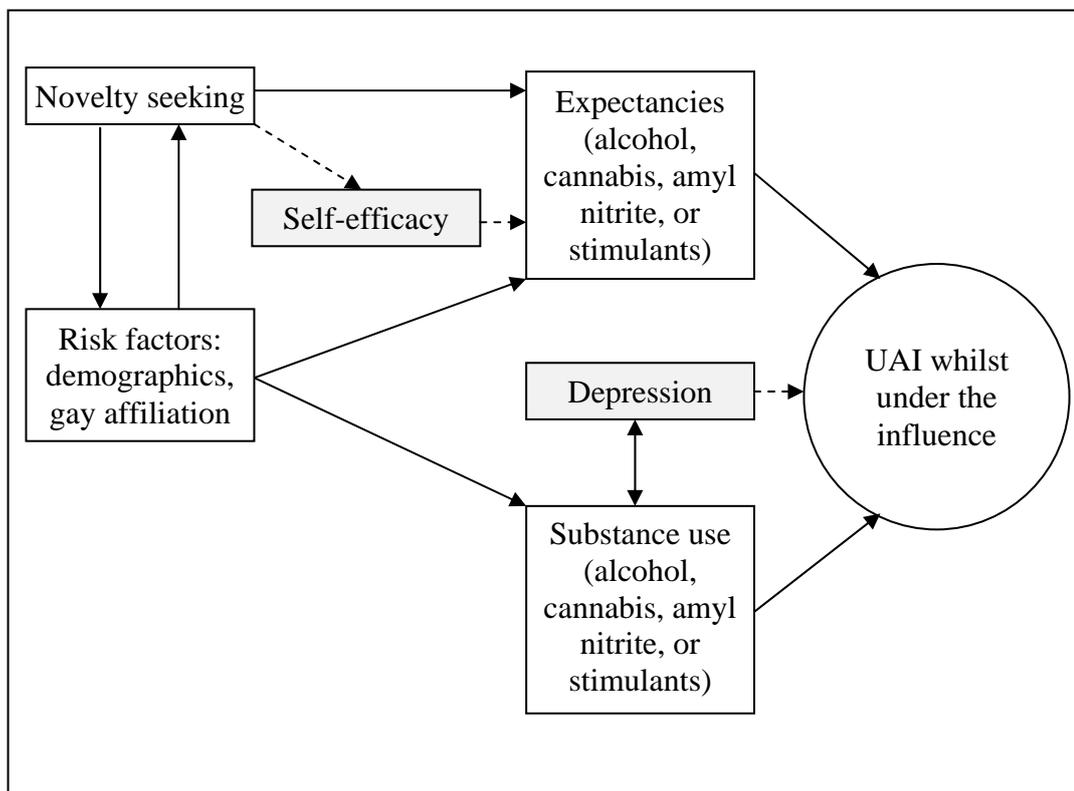
This study investigated whether or not the predictive model, based on SCT, could effectively discriminate those who do and do not engage in UAI while under the influence. Findings from the DFA, which included the predictor variables substance use, expectancies and novelty-seeking, provided partial support. The model was predictive for alcohol and stimulants, but not for cannabis or amyl nitrite. This may suggest that certain drugs are associated with greater risk, and expectancy measures developed specifically for distinct substance types are important. Both sexual (“Sexual activity”) and non-sexual (“Social and emotional facilitation”) expectancy factors for alcohol uniquely contributed to UAI for alcohol using MSM. Previous studies which have solely focused on sexual domains of reinforcement from substance use may not be including important consequences which are directly and indirectly associated with sexual activity and HIV risk behaviour. These findings may suggest that sexual and non-sexual outcomes operate synergistically to influence post-use behaviour (Mullens et al., 2009; 2010; Myers et al., 2004).

As expected, both substance use and substance related expectancies uniquely contributed to UAI while under the influence—while novelty-seeking did not. This finding is contradictory to previous research (e.g., Kalichman et al., 1998; 2002) that

has demonstrated novelty-seeking is related to both sexual risk and substance related expectancies. Differences in findings, however, may be related to how sexual risk was assessed (e.g., number of sexual partners versus UAI in the current study) or differences in measures of risk-taking personality characteristics. Further, the current study utilised a more comprehensive and sophisticated measure of substance related expectancies with robust psychometric properties (see Mullens et al., 2010; 2011; *in press*), which represents an important advance. Correlations indicated that novelty-seeking was positively associated with expectancies (but not substance use), which may suggest that those with risk-taking personality characteristics represent a unique risk group and should be targeted for health promotion and interventions regarding modifying beliefs associated with use (Leventhal & Schmitz, 2005). Novelty-seeking may also be associated with a greater desire to obtain specific reinforcing consequences of substance use.

Findings from the current study support association between expectancies and consumption patterns for three of the four substance types (amyl nitrite, cannabis and stimulants). Consistent with previous research among the general population (Fromme et al., 1993; Fromme & D'Amico, 2000) and MSM (Mullens et al., 2010; 2011; *in press*), greater use tended to be associated with positive reinforcing consequences (e.g., social and emotional facilitation, sexual enhancement), while negative consequences (e.g., disorientation, cognitive impairment ) tended be associated with less use. It is important to note that "Sexual negotiation" (which assesses beliefs in relation to sexual practices such as condom use) was associated with greater use of any stimulants and lower cannabis and ecstasy use, which is consistent with previous research (Calafat et al., 2008; Carey et al., 2009; Parsons & Bimbi, 2007; Nanin & Parsons, 2006).

Overall, findings from the current study show strong support for a key construct of SCT, expectancies. Across significant models for alcohol and stimulants, the percentage variance accounted for ranged from 14.3%-19.7% ( $M = 17.3\%$ ). Although the current models are significant, other factors, which were not measured, may be contributing to this predictive model. Additional key social cognitive variables worthy of inclusion in future research are self-efficacy (e.g., for condom use, refusing UAI—particularly while high or intoxicated) and expectancies regarding condom use (O’Leary, Wolitski, Remien, Woods, Parsons, Moss, & Lyles, 2005; Wulfert & Wan, 1995; see Figure 9). Psychological factors (e.g., depression, self-worth, stigma, internalised homophobia) are also likely to be worthy of further investigation. In addition, future research could explore how self-efficacy may be related to both novelty seeking and expectancies; and the role of depression in influencing both substance use and sexual risk-taking.

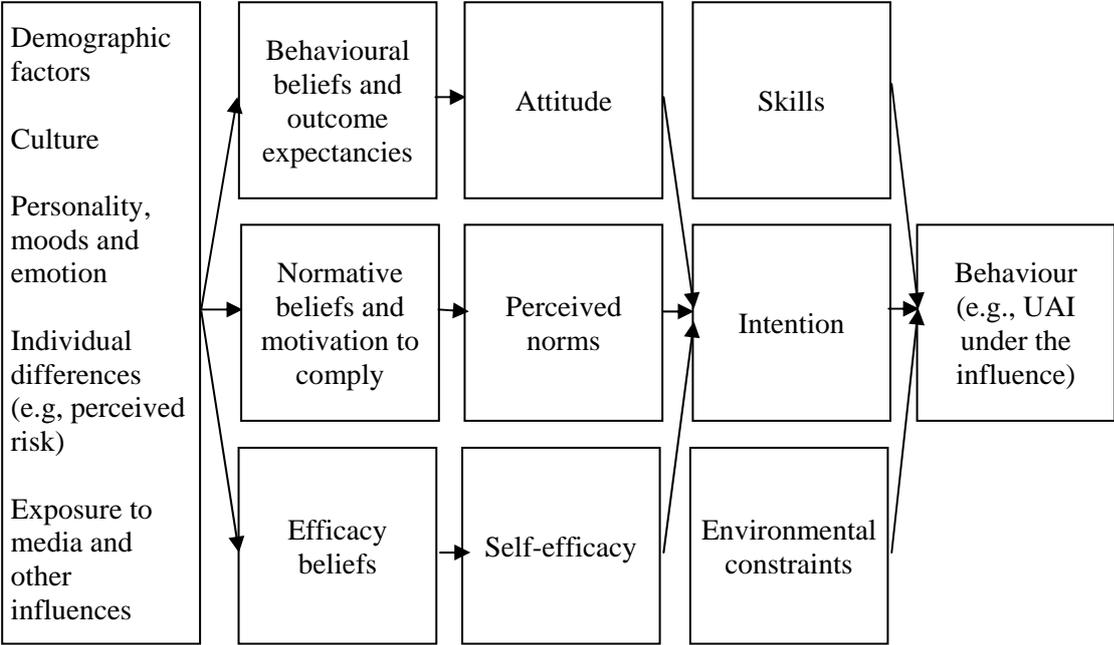


**Figure 9:** Predictive model to test in future research, based on current findings and SCT

In addition, consistent with SCT, future research should investigate additional psychological and contextual factors (e.g., partner characteristics, where sex occurred, HIV serostatus) associated with both substance use and sexual risk-taking, and also include protective influences (e.g., assertiveness; Chassin, Carle, Nissim-Sabat, & Kumpfer, 2004; Leventhal & Schmitz, 2006).

Use of Fishbein's integrative model (Fishbein, 2000; Fishbein & Yzer, 2003), based on a combination of SCT, the Health Belief Model (Janz & Becker, 1984) and Theory of Reasoned Action (Ajzen & Fishbein, 1980) can also help to inform future research and intervention efforts, and could be adapted to include substance use. Some of the factors in this model that influence behaviour and should be tested in

future research include: attitudes (including expectancies), norms, self-efficacy, skills, intention and environmental factors (see Figure 10).



**Figure 10: Integrated Theoretical Model for predicting behaviour (Fishbein & Yzer, 2003)**

Previous research in research regarding general health behaviours, HIV prevention and sexual health (O’Leary et al., 2005; Safren, Traeger, Skeer, O’Clerigh, Meade, & Covahey, 2010; Semple et al., 2000; Wulfert & Wan, 1995) and substance use (Connor, Young, Williams, & Ricciardelli, 2000; Peters et al., 2007; Siegel et al., 2008) indicate strong support for these factors, particularly self-efficacy. However, significantly less is known about how these variables apply to patterns of substance use in conjunction with sexual risk-taking.

**Implications**

Implications are comprehensively discussed in Chapter 9, in relation to the entire program of research.

**Limitations and future research.**

Limitations and future research topics are comprehensively discussed in Chapter 9, in relation to the entire program of research.

**Chapter Summary**

Use of the SEP-MSM has allowed us to examine the relative contributions of substance use, novelty-seeking and expectancies on UAI to be examined across four commonly used substance types among MSM, with each substance type showing a unique pattern. The current research fills an important niche in better substantiating hypotheses regarding the role of expectancies and substance use on risk-taking, and it helps us to better understand which drugs are associated with greater risk. The SEP-MSM has significant utility in predicting UAI among MSM who may be at risk of sexual risk taking in conjunction with substance use patterns, particularly for alcohol and stimulant users. Future applications of the SEP-MSM in health promotion, clinical settings and research are likely to contribute to reducing harm associated with substance use among MSM (e.g., HIV transmission).

## Chapter 9: Discussion and Conclusions

### Purpose and Overview of the Research

This program of research had three main priorities. Firstly, to examine how MSM perceive the effects of substance use on their thoughts, feelings and behaviours (including sexual behaviours), across the *range* of commonly used substances (Phase 1). Little is known about how MSM perceive the consequences and reinforcement associated with their substance use. Clear recommendations based on a review of the literature emphasised the need to explore the *subjective* nature of substance use among MSM based on their lived experience. This information is fundamental to developing suitable prevention, health promotion and clinical interventions regarding substance misuse and associated harm (e.g., sexual risk-taking, HIV transmission). Data collected in this phase of research, have also contributed to the development of substance-related expectancy measures relevant to MSM (Phase 2).

The second aim of this research was to develop relevant measures of substance-related expectancies regarding substance use (Phase 2), across this *range* of substances commonly used by MSM (alcohol, cannabis, amyl nitrite and stimulants). Previous research has demonstrated an association between substance-related expectancies and substance use (Aarons et al., 2003; Goldman et al., 1987; Mullens et al., 2010; 2011; *in press*; Oei & Young, 1987), however very little is known about reinforcement from substance use among MSM. This group experiences unique patterns, contexts and harm (e.g., HIV transmission) associated with substance use. Because expectancies, or beliefs pertaining to perceived reinforcement, are related to cultural aspects of a distinct group, it is likely that existing expectancy measures would not sufficiently capture the lived experiences of

gay men. This information was required to help to prevent the development of substance misuse among young gay men and contribute to harm reduction. Further, this phase of research has allowed for prevailing hypotheses regarding the mediational role of expectancies in substance use and sexual risk-taking to be tested. The final aim of this program of research tested a multi-dimensional model incorporating demographic factors, substance use, substance-related expectancies and personality characteristics (e.g., novelty-seeking) to predict UAI while under the influence (Phase 3). This information was required to better understand what factors uniquely contribute to UAI in conjunction with substance use and which substances carry heightened risk (Phase 3).

These research aims were addressed using a mixed-method research approach. Phase 1 included an initial examination of the typical and variant domains of perceived reinforcement among MSM using Consensual Qualitative Research methodology, across four commonly used substance classes (alcohol, cannabis, amyl nitrite, stimulants). Data analyses yielded key themes related to this topic, as well as the generation of items to be incorporated into subsequent substance-related alcohol and drug expectancy measures (Phase 2). In Phase 2, expectancy questionnaires were administered to a community sample (throughout Queensland) of MSM online. Statistical techniques (e.g., exploratory factor analysis) were used to refine and substantiate the measures. Phase 3 assessed demographic factors, sexual risk-taking behaviours, substance use patterns, substance-related expectancies and novelty-seeking personality characteristics among a subsequent broader community sample of MSM (throughout Australia), and sought to answer the following: Do substance related expectancies underlie or moderate the relationship between substance use and HIV risk behaviour while under the influence?; How do patterns vary by substance

type?; and What factors most significantly contribute to substance use while under the influence?. Use of discriminant function analysis contributed to understanding the relative contributions of key predictive variables on discriminating MSM who do or do not engage in UAI secondary to substance use.

### **The consequences of substance use in a community sample of MSM.**

Use of a multi-phase, mixed-method design utilising a conceptual model based on SCT and involving members of the gay community throughout the entire program of research, allowed for a thorough examination of the consequences of substance use among this community sample.

### **Development of qualitative themes.**

The CQR process employed in Phase 1 identified a wide range of sexual and non-sexual themes. These outcomes were described as directly and indirectly related to sexual behaviour and HIV risk behaviour. Further, the domains of perceived reinforcement seemed to operate independently, cumulatively *and* synergistically (see Mullens et al., 2009b). Participants reported substances affecting them differently across contexts and at times reported paradoxical effects associated with a given substance. There was a high degree of individual variation in reported outcomes across participants. These findings provided support for the role of expectancies and settings operating over and above the pharmacological effects of a given substance. Further, participants reported strategic and intentional use of substances alone and in combination to produce desired effects. Some of these effects included specific sexual outcomes (e.g., use of stimulants to engage in sexual

practices for prolonged periods with multiple partners), which were likely to increase HIV transmission.

### **Development of an expectancy profile.**

The themes identified in Phase 1 were systematically investigated and refined utilising a comprehensive methodology and rigorous psychometric analyses in Phase 2. The four expectancy measures developed in this process, relevant to alcohol (DEQ-MSM), amyl nitrite (AEQ-MSM), cannabis (CEQ-MSM) and stimulant (SEQ-MSM) outcomes demonstrated sound psychometric properties. The strength of these factors, along with their relative independence, was confirmed by inter-factor correlational data, calculation of factor loadings, and inter-total correlations. All factors showed adequate reliability and validity (e.g., face validity, predictive validity, discriminant validity). Further, the measures were developed to be culturally appropriate and valid for use among MSM, which represents an important advance in the research literature.

### **Perceived reinforcement associated with each substance type.**

Through the use of exploratory factor analysis, distinct themes emerged relevant to each substance type (see Table 1 and Figure 8), which were associated with substance use (see Figures 3 to 7).

Outcomes related to 1) cognitive impairment, 2) social, emotional and/or cognitive facilitation, 3) sexual enhancement, 4) sexual activity, and 5) sexual negotiation or risk-taking were common across multiple substance types. However, variation across expectancy measures was evident (e.g., sexual impairment associated with alcohol and stimulant use; cognitive impairment associated with

alcohol, amyl nitrite and cannabis use). A minority of factors were distinct to a specific substance type (e.g., sexual disinhibition secondary to cannabis use, disorientation secondary to amyl nitrite use). Factors were related to sexual (e.g., “Enhanced sexual desire”, “Sexual activity”) and non-sexual (general; e.g., “Cognitive impairment”, “Cognitive and social facilitation”) consequences, and reflected outcomes that were perceived as positive (e.g., “Social and emotional facilitation”, “Enhanced sexual desire”) and negative (e.g., “Disorientation”). These outcomes were, potentially, directly (e.g., “Sexual negotiation”, “Sexual risk-taking”) and indirectly (e.g., “Cognitive impairment”, “Enhanced sexual desire”) related to UAI. Further, outcomes such as sexual impairment (associated with negative loadings within the DEQ-MSM and SEQ-MSM) may make UAI *more* likely, given that MSM may elect to be a receptive (versus insertive) partner if they are experiencing erectile difficulties while intoxicated, which is consistent with reports during Phase 1 and future research is warranted. Specific factors regarding sexual negotiation or risk-taking, which may be assumed to be most directly related to UAI while under the influence, were reflected in the expectancy scale factors for amyl nitrite, stimulant and cannabis use.

### **Testing a model of HIV risk behaviour: Substance use, expectancies and novelty-seeking.**

Collecting data in relation to substance use, expectancies (utilising the newly developed SEP-MSM), sexual activity, novelty-seeking and other risk factors (e.g., demographics, gay affiliation), allowed a multi-dimensional model to be tested to predict UAI in conjunction with substance use. Statistical analyses (e.g., correlations, t-tests, chi square) were utilised to explore the relationships among

predictor variables, and between predictor variables and the primary outcome variable of interest (i.e., UAI while under the influence). For example, the significant DFA model for alcohol (DEQ-MSM total score) reflected the combined contributions e.g., substance use, expectancies, novelty-seeking), provided the most significant contributions to the predictive model relative to each substance type.

Results from the DFA indicated that the combination of *both* substance use and expectancies were significant contributors to discriminating MSM who do or do not engage in UAI while under the influence regarding alcohol (DEQ-MSM total, Factor 2 “Social and emotional facilitation” and Factor 3 “Sexual activity”) and stimulants (SEQ-MSM total). Novelty-seeking was not a significant factor in the model, nor were models tested for cannabis or amyl nitrite significant. It is interesting to note that, although sexual negotiation or risk-taking was not a unique factor represented in the DEQ-MSM, the total score and other factors (e.g., “Social and emotional facilitation”, “Sexual activity”) were associated with UAI while under the influence. This may suggest that social and emotional facilitation may be related to other factors along the temporal sequence leading up to substance use, such as meeting a potential sexual partner and having intercourse, drinking to elevate mood prior to looking for partners, and increasing confidence or becoming less selective about possible sexual partners.

### **Summary of unique contributions of the program of research.**

This program of research comprehensively investigated the reinforcing consequences of substance use across the range commonly used substances among MSM. Findings suggested the wide range of perceived reinforcement includes both sexual and non-sexual consequences. These effects can work independently,

cumulatively and synergistically to influence outcomes post use, including sexual behaviour and risk-taking. This program of research developed novel, psychometrically robust and valid measures to assess these consequences, specific to four distinct drug classes and specifically for use among MSM. This research program utilised the SEP-MSM to test a prevailing hypothesis (e.g., expectancies as a moderating influence) regarding the associations between substance use and sexual risk-taking, based on SCT. This hypothesis was confirmed among alcohol and stimulant users. Consideration of patterns of reinforcement allows for speculation regarding risk factors that may predispose MSM to the development of particular expectancies (e.g., depression or low self-confidence may be associated with expectancies for social and emotional facilitation; poor assertiveness or low self-worth may be associated with poor sexual negotiation expectancies; see Demmel, Nicolai, & Gregorzik, 2006; Johnson & Gurin, 2006; Maisto et al., 2010). This is an important area for future study, as balanced placebo studies have shown that some domains of expectancy (e.g., social aspects) are more strongly influenced by social learning than others (e.g., physiological effects), and are likely to also be strongly influenced by contexts of use (Marlatt & Rosenow, 1980).

### **Contribution to theory.**

This research has demonstrated that the combination of both substance use and expectancies can significantly predict UAI whilst under the influence amongst alcohol and stimulant users. Findings from the current study show strong support for a key constructs of SCT, expectancies, for two key drug classes. It is possible that this theory is supported for alcohol and stimulant users because these drug classes are frequently or exclusively used in social and sexual settings (Calafat et al., 2008).

Social learning influences are, thus, more relevant due to the stronger emphasis on social contexts of use for these drug classes (e.g., Marlatt & Rosenow, 1980). In contrast, amyl nitrite for example is used almost exclusively in specific, highly sexualised contexts among MSM and has short-lived physiological effects that may be less influenced by social learning (Lampinen et al., 2007). Cannabis is more likely to be used in both social and non-social environments where overall the effects of social learning may be less relevant (Green et al., 2003).

Across significant models for alcohol and stimulants, the percentage variance accounted for ranged from 14.3%-19.7% ( $M = 17.3\%$ ). Although the current models are significant other factors, that were not measured, may be contributing to this predictive model. Additional key social cognitive variables worthy of inclusion in future research are self-efficacy (e.g., for condom use, refusing UAI—particularly while high or intoxicated) and expectancies regarding condom use (O’Leary et al., 1995). Use of Fishbein’s integrative model (Fishbein, 2000; Fishbein & Yzer, 2003) can also help to inform future research and intervention efforts. Some of the factors in this model that influence behaviour include attitudes (including expectancies), norms, self-efficacy, skills, intention and environmental factors (see Figure 10) and also warrant further investigation. Previous research in research regarding general health behaviours, HIV prevention and sexual health (O’Leary et al, 2005; Safren et al., 2010; Semple et al., 2000; Wulfert & Wan, 1995) and substance use (Connor et al., 2000; Peters et al., 2007; Siegel et al., 2008; Young & Oei, 1993) indicate strong support for these factors, particularly self-efficacy. However significantly less is known about how both expectancies and self-efficacy (and other SCT variables) relate to substance use and sexual risk-taking.

In addition, consistent with SCT, future research should investigate additional demographic and contextual factors (e.g., partner characteristics, where sex occurred) associated with both substance use and sexual risk-taking, and also include protective influences (e.g., assertiveness; Chassin et al., 2004; Leventhal & Schmitz, 2006). It is also important to better understand the development and maintenance of expectancies. Risk factors that give rise to particular expectancies (i.e., more dangerous; e.g., sexual negotiation and risk-taking) may be particularly important, as HIV-related consequences of substance use are significant and permanent.

## **Implications**

### **Development of expectancies.**

Findings from the current study have implications regarding the development of substance misuse among young gay men, including the acquisition and maintenance of expectancies. Based on SCT individuals learn about reinforcing aspects of substance use before ever using substances, typically through media portrayals, parents and peers (Brown, Creamer, & Stetson, 1987). Drug expectancies change and develop over time and are influenced by direct experiences and intrapersonal and environmental factors (Leventhal & Schmitz, 2006), which are likely to be particularly salient to social and sexual contexts within the gay community. Young gay men may be particularly susceptible to developing strong expectancies regarding substance use due to unique patterns and contexts of substance use among MSM and specific stressors associated with being gay. Interventions focused on expectancies among MSM could include preventing the onset of risk, improving existing risk factors, altering the formation of expectancies

and modifying maladaptive expectancies (Cruz & Dunn, 2003; Leventhal & Schmitz, 2006). It is also important for prevention efforts to target children and young adolescents to challenge commonly held ideas about the effects of substance use and replace them with more realistic and accurate perspectives, including developmentally appropriate health and safety consequences associated with substance use (Bittner, 1997). Such messages could be delivered within schools or mass media and may be most effective during primary school years (Bittner, 1997).

### **Health promotion and HIV prevention.**

This community sample of MSM was characterised by multiple substance use, and the combination of substance use and expectancies was significantly associated with UAI among alcohol and stimulant users. It is important to educate members of the gay community about the potential harms associated with substance use and the increased health burden associated with these issues among members of their communities. Campaigns should highlight positive (e.g., sexual enhancement) and negative (e.g., disorientation) aspects of use, especially in relation to sexual activity and harm reduction strategies (e.g., discussing condom use or HIV status before using amyl nitrite and having sex; bringing condoms with you if you plan to use stimulants). Campaigns could also challenge unhelpful or unrealistic beliefs (e.g., drinking improves sexual performance), and highlight specific risks (e.g., stimulant use is associated with less negotiation about condom use and discussion of HIV status) using relevant messages regarding perceived consequences of use and risk factors specific to a given substance type (Prestage, 2009). Language around delivering such messages must be careful not to imply or infer that substance use is an *excuse* for unsafe sexual practices (Bolton et al., 1992; Leigh & Stall, 1993; Stall

& Purcell, 2000). Messages could encourage and support MSM to reduce or modify their use, and develop alternatives to obtaining perceived reinforcement from use (e.g., exercise to improve mood instead of drinking). Health promotion and HIV prevention messages should focus on frequently reported expectancies and expectancies that are most strongly associated with UAI for each substance type (e.g., “social and emotional facilitation” and “sexual activity” for alcohol users; “sexual enhancement” and “sexual negotiation” for stimulant users). Consistent with recent HIV prevention campaigns within Australia, messages should encourage MSM to reflect on their behaviour and empower them to consistently use condoms (e.g., “You don’t have to go with the flow...you can make safe decisions about sex even while drunk or high on stimulants”). For MSM whose expectancies regarding a desire for sexual enhancement predispose them to greater HIV-risk, messages should focus on other, creative ways to obtain sexual satisfaction while using condoms, sexual practices associated with lower risk of HIV transmission (e.g., oral sex, mutual masturbation).

For MSM who currently use substances, it is known that health promotion campaigns within the gay community can effectively employ the following secondary prevention components: use of fact based information (Gustafson, 1986), small group interventions such as the Alcohol Skills Training Program (Fromme, Marlatt, Baer, & Kivlahan, 1994; Kivlahan, Marlatt, Fromme, Coppel, & Williams, 1990) adapted for use with MSM (see Shoptaw et al., 2005) and expectancy challenges (Darkes & Goldman, 1993; Dunn, Lau, & Cruz, 2000). Based on data from the current study, it is important for health promotion messages to inform gay men that substance use and the associated beliefs may increase their risk of exposure to HIV. Messages could focus on expectancies more frequently endorsed by those

who combine UAI and substance use (e.g., becoming “less rational” when drinking; being “more forward with possible sexual partners” when drinking). However, such efforts must be careful not to frame messages substance use can serve to be an excuse for behaviour while under the influence (Bolton et al., 1992; Leigh & Stall, 1993; Stall & Purcell, 2000). It is also important to educate members of the gay community about the potential harms associated with substance use, work to modify community norms around both substance misuse and UAI (Kurtz, 2005), and developing places for MSM to socialise and feel a sense of community that do not focus on substance use or sex. It is also important to develop substance use treatment approaches that are relevant, accessible and sensitive to the needs of substance-using MSM (Prestage, 2009; Stall & Purcell, 2000). Improved links with community services to treat psychological issues that may be related to higher substance use is also important.

Further, health promotion strategies must be sensitive to fact that many MSM combine substance use and sex for specific reinforcement purposes (Mullens et al., 2009b), and taking a ‘no sex while high or drunk’ approach is not likely to be relevant or effective for all drug-using MSM. This is particularly salient due to the normative influences of combining sex and drugs and the importance placed on sexual consequences of substance use (Myers et al., 2004). Health promotion approaches must include educating and empowering MSM to maintain safer sexual practices while using substances and increasing their self-efficacy to do so (Leigh & Stall, 1993; Myers et al., 2004; Schuper et al., 2009), and to plan drug use and to make safer sex more likely to occur (Stall & Purcell, 2000) as it has been demonstrated that MSM who use drugs are capable of making sound decisions about sexual risk (Leigh & Stall, 1993; Prestage, 2009). Such messages could include

“Think *before* you drink, and *while* you drink. Use a condom every time.” or “Drunk or high, you still have a *choice* about condoms, protect yourself and each other.”

Messages could be partially modelled on an existing campaign developed by the AIDS Council of New South Wales, which reinforced the idea that if someone can engage in other decision-making processes while under the influence (e.g., dialling a cab, getting home, choosing not to drive drunk), that they can manage to use a condom while under the influence. Further HIV prevention campaigns can target those who have specific risk factors associated with greater use and expectancies, as a means of further tailoring health promotion to those who may be at increased risk (e.g., older MSM who may show higher consumption patterns). These applications may help to buffer or counter expectancies associated with use, particularly in relation to sexual negotiation. Further, expectancies can be measured to test the effectiveness of health promotion campaigns.

Expectancies could also be incorporated into a self-assessment and educational resources for use with gay community health workers, based on CBT and MI principles (Mausbach, Semple, Strathdee, Zians, & Patterson, 2007) that have shown good effectiveness with a wide range of populations. These resources could assist MSM to identify, challenge, modify expectancies, reinforce negative expectancies, and develop alternatives for positive reinforcement that are associated with less harm (e.g., exercise to improve mood instead of drinking). It should be noted however that expectancies vary significantly from one individual to another, and health promotion and clinical tools must reflect this (Ostrow, 1996). Considering reasons *why* MSM use substances (e.g., to enhance mood) and developing means to prevent or treat these factors (e.g., reducing homophobia to help MSM feel better about themselves, providing appropriate and accessible mental health treatment options),

also represent a useful avenue for health promotion (Ostrow, 1996). Further, providing increased education and awareness about matters of gay acceptance to members of the general population to decrease homophobia, stigma and discrimination (Mullens et al., 2009b; Nakamura et al., 2009) may be important avenues for health promotion.

### **Clinical Applications**

Information gained from the current study could be incorporated into screening and clinical interventions within sexual health, alcohol and drug and gay community health settings. Using the predictive formulas derived from DFA regarding the combination of substance use and expectancies may be useful in screening and developing clinical algorithms and pathways to determine those who may be at greater risk of transmitting HIV, particularly in sexual health settings. Expectancies are also highly relevant to clinical interventions to reduce both substance misuse and UAI, among MSM who combine substance use and sexual activity. For example, MSM who attend sexual health clinics for repeat post-exposure prophylaxis secondary to UAI while intoxicated could benefit from a brief intervention regarding contributing beliefs (e.g., alcohol makes me more outgoing), and establishing alternatives to achieving the reported effects of substance use (e.g., relaxation, enhanced mood).

Use of the SEP-MSM could be used for assessment and monitoring purposes during therapy. Further, building upon what is known about effective psychological therapies, specific expectancies can be incorporated into CBT, with the aim of challenging and modifying unhelpful beliefs (Bittner, 1997; Kalichman et al., 2002; McKirnan et al., 2001; Shoptaw, Reback, Peck, Yang, Rotheram-Fuller, & Larkins,

2005). Expectancies can also be incorporated into MI approaches (Bimbi et al., 2006; McVinney, 2006; Nanin & Parsons, 2006; Parsons & Bimbi, 2007), particularly as highlighting negative consequences of use may facilitate motivation to decrease substance use (Bittner, 1997; Leventhal & Schmitz, 2006). Further, alternatives can be developed to gain perceived positive reinforcement with reduced harm (e.g., creative ways to enhance sex that do not include substance use; Chesney et al., 1998, Kurtz, 2005).

It is important for clinicians (e.g., psychologists, nurses, doctors) to ask more questions regarding patterns and contexts of substance use and to consider the thoughts, feelings and behaviours associated with the temporal sequence leading up to both substance use and sexual activity, and underlying psychosocial mechanisms (Bimbi et al., 2006). This is important as the combination of pharmacological properties and perceived reinforcement influences post-use outcomes, including UAI. Thus, interventions must address both. The results from the current study suggest, that given the role of substance use and expectancies in sexual risk-taking, substance use treatment may be a form of HIV prevention in and of itself (consistent with previous research; e.g., Parsons & Bimbi, 2007; Shoptaw & Frosch, 2000), particularly among alcohol and stimulant users. Ostrow (1996) believes that interventions must consider: an individual's preference for unprotected sex, addiction to substances, experiences of sex while intoxicated and a desire to alter one's mental state to escape from associated stressors (e.g., grief and loss, homophobia, anxiety about HIV/AIDS). Thus, incorporating expectancies into substance use treatment services for MSM may also contribute to reducing both consumption patterns and associated harm (e.g., sexual risk-taking). Examples could include providing realistic information regarding possible consequences of use,

reinforcing negative consequences, and developing alternatives for obtaining positive reinforcement that do not involve substance use. Other established avenues regarding prevention efforts include providing education and interventions in places where MSM combine substance use and sexual activity (e.g., SOPV, circuit parties, Mullens et al., 2009a; Ostrow, 2000; Stall & Purcell, 2000).

Clinicians working in alcohol and drug areas must be well informed about cultural and contextual issues associated with substance use among MSM and well trained to assess harms associated with substance use (e.g., HIV) in a sensitive, respectful and nonjudgmental manner (Reback, 1997; Stall & Purcell, 2000). It is also known that providing substance use treatment options specifically for MSM is important (e.g., Lyons, Chandra, & Goldstein, 2006). Likewise, clinicians working in sexual health settings must be well trained in assessing substance use patterns, particularly in relation to use before or during sexual contact. It is also important for people working in the gay community and health sectors to be well informed about matters pertaining to both substance use and sexual practices. The health sector, particularly in sexual health and alcohol and drug settings, could also benefit from routine enquiry about sexual orientation so that the consumer's health can be considered in a holistic manner. Further, screening for anxiety and depression among substance using MSM, particularly for those who combine sex and drugs, is likely to be useful for developing referrals for treatment—that is also likely to result in reducing both substance use and associated harm. Further, providing increased education and awareness about matters of gay acceptance to members of the general population to decrease homophobia, stigma and discrimination (Nakamura et al., 2009) may also be important avenues for health promotion.

### **Strengths and Limitations of the Research**

There are a number of strengths to this program of research. First, the expectancy measures relevant to alcohol, amyl nitrite, cannabis and stimulants were developed to be culturally appropriate and valid for use among MSM. The development of these expectancy measures is particularly significant as the potential moderating role of expectancies in understanding the relationships between substance use and expectancies on UAI under the influence has not been able to be sufficiently tested. Thus, this research is first of its kind, known to date, to test the relative contributions of substance related expectancies, substance use and novelty-seeking on HIV risk behaviour, across the *range* of substances commonly used by MSM.

Secondly, the scope and breadth of this project allowed for a thorough and comprehensive investigation of the wide range of reinforcing aspects of substance use to organically emerge from MSM from the ‘ground up’ via qualitative processes (Phase 1). These themes were then further substantiated and refined through methodological rigor and psychometric evaluation (Phase 2). Finally, they were tested in relation to a multi-dimensional predictive model regarding UAI while under the influence (Phase 3). Phases 2 and 3 each employed a relatively large community sample of MSM ( $n = 249; 277$ ), while Phase 1 included a smaller sample collecting in-depth data, consistent with attaining “saturation” in responses using CQR.

Utilising a conceptual and theoretical model, based on a social-cognitive approach, allowed for a hypothesised model of substance use and sexual risk-taking to be tested and refined in relation to MSM (with the inclusion of the newly developed expectancy measures). Involving members of the gay community

throughout the program of research ensured that the research remained relevant, and helped to facilitate participant recruitment, refine methodological issues and promote rapid dissemination of findings. Use of novel recruitment and administration procedures, utilising online questionnaires and social media, assisted with making participation in the research accessible and convenient for MSM, and is likely to have increased the perceived confidentiality and anonymity—particularly in relation to highly sensitive topic areas (Carpenter, Stoner, Mikko, Dhanak, & Parsons, 2009; Hidika & Operario, 2006; Raymond, Rebchook, Curotto, Vaudrey, Amsden, & Levine, 2009). Findings from this program of research also have direct applications to health promotion, HIV prevention, clinical interventions, theory and future research (described in previous sections).

Regardless of the strengths of this program of research, it is also important to acknowledge the limitations related to study methodology, design and use of statistical techniques. The samples included in the three phases of research are not representative of MSM as a group. Despite the apparent candour of participants' responses, some participants may have been reluctant to disclose the full extent of their experiences (Phase 1), however perceived anonymity and confidentiality may have been corrected through the use of online data collection techniques in subsequent research phases (2 and 3). Recruiting participants specifically about substance use through gay community and media networks (Phases 2 and 3) may have attracted a higher proportion of more experienced substance users, particularly as greater gay community affiliation has been shown to be associated with consumption patterns. MSM who do not necessarily identify as "gay" or "bisexual" may have been under-represented secondary to recruitment strategies through the gay community.

Recruiting through sexual health and medical centres (Phase 1) may have also attracted a greater proportion of participants who engage in greater sexual activity or risk-taking; however, this sample could be reflective of a more conscientious group of MSM who are motivated to maintain their health. Sampling via self-selection may have attracted a more motivated group. Further, employing online recruitment and questionnaire administration may be reflective of a better-educated group of MSM with greater socio-economic status. Use of paper-pencil measure or assisted administration of measures in future research would allow for greater representation of MSM with poor access to computers or literacy issues. Despite the apparent candour of participants' responses, some participants may have been reluctant to report the full extent of their experiences, particularly in the qualitative phase. It also remains somewhat unclear if substances are part of an active strategy to reduce self-awareness regarding sexual risk-taking (Halkitis et al., 2005) or a subsequent attribution for behaviour while under the influence.

Limitations also exist regarding the use of self-report measures for measuring consumption patterns and sexual behaviour in terms of introducing bias and inaccuracy (Jaccard et al., 2004; Woolf & Maisto, 2009). Future studies should include biochemical measures to independently validate patterns of consumption. Further, stimulants represent an aggregate group in the current study as a useful starting point for research in this area. However, future research should explore the unique contributions and distinctions among stimulant drugs (e.g., ecstasy, amphetamines, crystal methamphetamine). It will also be useful for future research to explore the perceived consequences of *other* substances commonly used by MSM that may also be paired with sexual activity (e.g., GHB, ketamine, Viagra<sup>®</sup>), and develop expectancy measures in relation to these.

Additional limitations exist in relation to poly-substance use, and based on the way the questions were asked it was not possible to ascertain which substance(s) were used in relation to UAI episodes and whether or not more than one substance was used in relation to UAI while under the influence. These methodological limitations should be addressed in future research. Future research should utilise more *specific* questions regarding which substances were used before and during sexual contact on distinct occasions—and how this relates to the corresponding substances and expectancies considered, as well as the effects of poly-substance use on sexual practices. The current research provides evidence for the need to explore the effects of other substances that MSM use recreationally and combine with sex (e.g., Viagra<sup>®</sup>, GHB, ketamine, cocaine, heroin). It is important to test and refine the model with additional and larger samples to strengthen findings and generalisability, particularly employing larger samples of MSM who use amyl nitrite and cannabis. Smaller samples associated with these substance types in the current study may reduce the validity and generalisability of findings pertaining to cannabis and amyl nitrite users. The original (four factor) SEP-MSM should also be utilised. Future research should disaggregate substance use by stimulant type, so that the *distinct* effects of use of crystal methamphetamine, amphetamines and ecstasy on sexual practices can also be understood.

In addition, use of online recruitment strategies and questionnaire administration may have also attracted a well-educated group that may have higher socioeconomic status than may be representative of MSM as a group. However, this use of the internet is highly relevant to this group, as procuring drugs and sexual partners is often done online and computer administration may assist in reassuring participants of confidentiality and anonymity, particularly in relation to sensitive

topics areas (Bowen, Williams, Daniel, & Clayton, 2008; Raymond, Curotto, Vaudrey, Amsden, & Levine, 2009). The HIV status of participants and their sexual partners was not specifically asked in the protocol and some variation may impact upon sexual practices (e.g., strategic positioning, negotiated safety, sero-sorting; e.g., Crawford et al., 2001), and expectancies (Bimbi et al., 2004). Future research should include more detailed questions regarding sexual activity (e.g., partner characteristics, where sex occurred or met partner, serostatus of both partners).

Although the four expectancy measures developed demonstrated good psychometric properties and are appropriate for use among MSM, these scales and associated findings are limited because they do not include other determinants that may influence or mitigate substance usage (e.g., availability, cost availability). Future research could include these factors to increase understanding of other factors associated with perceived reinforcement and consumption patterns.

Across all significant models in Phase 3, the percentage variance accounted for ranged from 14.3%-19.7% (average = 17.3%), which suggests that although the current models are significant, other factors are significantly contributing to this predictive model. Other factors, which were not measured, may be significantly contributing to these predictive models. Additional key social cognitive variables worthy of inclusion in future research are self-efficacy (e.g., for condom use, refusing UAI—particularly while high or intoxicated) and expectancies regarding condom use (O’Leary et al., 2005; Wulfert & Wan, 1995; see Figure 9). In addition, consistent with SCT, future research should investigate additional psychological and contextual factors (e.g., partner characteristics, where sex occurred, HIV serostatus) associated with both substance use and sexual risk-taking, and also include protective

influences (e.g., assertiveness; Chassin et al., 2004; Leventhal & Schmitz, 2006).

CFA are required to further test and refine the SEP-MSM, and SEP to test and substantiate these relationships. CFA is beyond the scope of this thesis, and would require testing the model on a larger sample of approximately 1500 (based on the model assumption that items within each factor of the SEP-MSM are related, and would require an oblique rotation for analysis).

### **Future Directions**

This program of research has highlighted a number of areas for future research, some of which have been mentioned previously. Firstly, it is essential to recruit a larger sample (e.g., 1500+ participants) to increase statistical power and allow for conducting confirmatory factor analysis and structural equation modelling across the four expectancy measures comprising the SEP-MSM. It is recommended that further development and refinement of expectancy measures relevant to *specific* stimulant types, based on the SEQ-MSM (i.e., developing unique expectancy scales specifically relevant to crystal methamphetamine, amphetamines and ecstasy use) occur, as the reinforcement of these is likely to vary by subtype. More adequate investigation of the influence of poly-substance use on sexual risk-taking is also needed. Furthermore, it is important to replicate and extend Phase 3 methodology to further model build, refine and test the predictive model incorporating other factors hypothesised or demonstrated to contribute to the predictive model, consistent with SCT (e.g., self-efficacy).

More detailed questions in relation to specific substance type(s) used before or during occasions of UAI should be included, as well as the inclusion of more specific questions regarding frequency of use (e.g., past three months). Future research

efforts should incorporate, either, the original four-factor version of the SEP-MSM or develop new expectancy measures specific to the distinct stimulant subtypes (e.g., amphetamines, crystal methamphetamine, ecstasy). Additional samples should be employed to strengthen and increase the generalisability of findings, with a particular focus on larger samples of MSM who use amyl nitrite and who use cannabis. To assess the effectiveness of health promotion campaigns repeated measures assessing expectancies could be incorporated. In addition, it is important to test and substantiate factors that may underlie or predispose MSM to developing particular expectancies associated with substance use in future research.

Additional avenues for research involving the SEP-MSM and associated findings from this program of research seem obvious in clinical and health promotion settings. For example, testing and substantiating the utility of the expectancy measures in alcohol and drug and sexual health settings, by developing interventions to reduce substance use and sexual risk-taking while under the influence. These interventions would be based on the identified items or factors, and measure changes to expectancies secondary to interventions and how this relates to changes in substance use and associated harm (e.g., sexual risk-taking). Further, it would be useful to measure the effects of an HIV prevention campaign for those who combine substance use and sex, based on expectancies identified in the research.

There are also implications of this research regarding future clinical efforts and investigation. For example, it may be particularly important for clinicians (e.g., psychologists, nurses, doctors) to ask *more* questions regarding patterns and contexts of substance use and to consider the thoughts, feelings and behaviours associated with the temporal sequence leading up to both substance use and sexual activity, and

underlying psychosocial mechanisms (Bimbi et al., 2006). It is also likely to be important for psychologists working in this area to put more emphasis on obtaining a detailed functional analysis with clients, including antecedents and consequences of use, as well as identifying thoughts, feelings and behaviours experienced before, during and after use to assist with assessment and interventions (see Sturmey, 2007), and identifying expectancies which may assist with CBT and MI. The results from the current study suggest, that given the role of substance use and expectancies in sexual risk-taking, substance use treatment can be a form of HIV prevention in and of itself (Parsons & Bimbi, 2007; Shoptaw & Frosch, 2000), particularly among alcohol and stimulant users. Ostrow (1996) believes that interventions must consider: an individual's preference for unprotected sex, addiction to substances, experiences of sex while intoxicated or high, and a desire to alter one's mental state to escape from associated stressors (e.g., grief and loss, homophobia, anxiety about HIV/AIDS). Providing education and interventions in places where MSM combine substance use and sexual may be useful for prevention (e.g., SOPV, circuit parties, Mullens et al., 2009a; Ostrow, 2000; Stall & Purcell, 2000). Further, promoting activities and places to socialise that do not focus on substance use or sex would also be a useful advance.

Clinicians working in the alcohol and drug field should be well informed about unique patterns, cultural and contextual issues associated with substance use among MSM and well trained to assess harms associated with substance use (e.g., HIV) in a sensitive, respectful and nonjudgmental manner (Reback, 1997; Stall & Purcell, 2000). However, it is important that such education does not reinforce negative stereotypes about MSM, and does not suggest that *all* MSM engage in substance misuse or HIV risk behaviour. Providing substance use treatment options

specifically developed for MSM is also likely to be a useful advance (e.g., Lyons et al., 2006). Likewise, clinicians working in sexual health settings must be well trained in assessing substance use patterns (considering both quantity and frequency of use, range of substances used, and poly-substance use), particularly in relation to use before or during sexual contact. MSM must be encouraged to discuss these issues and be assured that such discussions will be conducted in a sensitive and non-judgemental manner.

Further, it is recommended that there is greater collaboration between sexual health, alcohol and drug, mental health, and gay community and health organisations. Some of the tangible outcomes associated with greater collaboration could include: determining what services are needed or need to be adapted to better meet the health needs of MSM and developing relevant intervention options, refining referral pathways for MSM experiencing substance use in conjunction with sexual risk-taking or mental health issues (particularly for those most at risk), and developing health promotion campaigns designed to educate MSM about health risks associated with substance use. Additional outcomes could include working to change underlying risk factors (e.g., mental health factors) and reducing associated harm (e.g., HIV transmission, substance dependence), associated with substance use. Funding bodies should more highly prioritise the prevention of unhelpful beliefs regarding the effects of substance use particularly among young MSM, interventions to prevent and alter risk factors (e.g., expectancies), and research regarding the role of self-efficacy in influencing expectancies and sexual behaviour related to substance use. The findings from this research are likely to significantly contribute to health promotion and clinical interventions, including HIV prevention.

## Conclusion

The current program of research explored the consequences of substance use in a community sample of MSM, and developed four novel and comprehensive expectancy measures relevant to four commonly used substance types. It also tested a prevailing hypothesis regarding the role of substance use and expectancies in predicting UAI whilst under the influence. Overall, the findings highlight a number of issues. First, perceived reinforcement of substance use varies significantly from one substance to another and from one individual to another, providing support for the role of expectancies and settings operating over and above the pharmacological aspects of a given substance, consistent with SCT particularly regarding alcohol and stimulants. Consequences of use represent, both, sexual and non-sexual domains, and are distinct to each substance type. These consequences are likely to influence post use thoughts, feelings and behaviours (including sexual behaviours), and operate in a cumulative manner to influence sexual behaviour. When both substance use and expectancies are considered together, they both uniquely contribute to UAI whilst under the influence among alcohol and stimulant users. It is especially imperative to consider the *constellation* of reinforcement surrounding substance use, expectancies *and* sexual practice, and how these forces operate *together* to influence sexual risk-taking and HIV exposure. These strong, mutually reinforcing and synergistic *combined* effects continue to represent a significant challenge for health promotion and HIV prevention.

This final chapter has highlighted the significance of this research examining perceived reinforcement of substance use among MSM and the overall findings; integrated across the three phases of research. This thesis has furthered our

understanding of social-learning, personality, substance use and key risk factors on influencing sexual behaviour among MSM and has significant potential to improve the development of prevention strategies and treatment approaches. Ultimately, it is hoped that such advances will reduce HIV transmission and significantly improve the lives of substance using MSM.

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**Appendix A: Invitation letter for panel member**

3 June 2006

Dear Panel Member,

Thank you for your interest and willingness to participate in our ongoing research regarding substance use among gay and bisexual men. I look forward to hearing your ideas at the upcoming meeting on 14 June at 2:30 (Biala building—7<sup>th</sup> floor meeting room).

As you are aware this project is related to questions and concerns that have been raised in recent years by community and healthcare workers, community members and researchers about how substance use may be impacting upon the sexual behaviours of MSM.

As part of this project, we have interviewed gay and bisexual men about their beliefs regarding the effects of substance use on their thoughts, feelings and behaviours—including sexual behaviours. Questions were asked in relation to the four most common classes of substances: alcohol, cannabis, inhalants (e.g., amyl) and stimulants (e.g., speed). Approximately twenty men participated and have provided useful (and candid!) responses to our questions.

Their responses have been compiled (verbatim) into a questionnaire—so that we can determine which statements best represent the beliefs and experiences of a wider group of MSM, and how these beliefs are related to patterns of substance use and sexual behaviour. Participants will be asked to rate the questionnaire items on a scale ranging from 1 to 5 (1 = “strongly disagree” and 5 = “strongly agree”). The questionnaire has aimed to capture and maintain the richness of information provided, however in its current form is too lengthy.

In your role as an expert panel member we would like to ask you to critically review each questionnaire item (statement) based on the following factors:

- 1) **Relevancy:** Does the statement accurately reflect ideas that you or others believe to be true about the perceived consequences of substance use?
- 2) **Appropriateness:** Is the statement appropriate (does it offend in any way)?
- 3) **Redundancy:** Does the statement represent a new idea (or does it duplicate too closely an idea mentioned elsewhere in that substance class)?
- 4) **Readability:** Is the statement understandable and clear?

I have enclosed the questionnaire items in their draft form, which includes specific sections for each substance class. Prior to the meeting I would ask that you read each of the statements and tick the boxes related to each item make some notes to bring along regarding *which items in each section you think need to be changed or omitted* (based on the above factors).

Your feedback will be used to revise the questionnaire so that it more appropriate for use among MSM and less cumbersome for participants to complete.

Your input and expertise will be invaluable to the aims and success of this project and I thank you again for your involvement!

Regards,

Amy Mullens

**Appendix B: Expectancy items for panel review***Alcohol Questionnaire items*

	<b>Not Relevant</b>	<b>Not Appropriate</b>	<b>Redundant</b>	<b>Not Readable</b>
1. I feel numb when I drink alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. When I drink I'm less inhibited	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. My thinking is slowed down when I'm drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Drinking makes me feel aggressive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Drinking makes sex more enjoyable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I don't think clearly when using alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. When I drink I am less choosy about sexual partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I may not know if a condom was used during sex when I've been drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. When I drink I can escape from my problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Drinking helps me to live in the moment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. My mood is better when drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. When I drink I become more sexually confident	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I feel more connected with other people after I've had alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Conversations are better when drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Not Relevant	Not Appropriate	Redundant	Not Readable
15. I make bad decisions when I use alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I become less talkative when drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. My judgement becomes impaired when using alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. When drinking my decision making abilities are impaired	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. I am more agreeable to decisions about sex when I've been drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. When drinking I feel more horny or sexually aroused	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Sex is better when using alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. When I'm drinking I think a lot more about sex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. I am more relaxed during sex when I've used alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Sex is less painful when I've been drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. My sexual performance is impaired when drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. I throw caution to the wind when I drink	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. I'm more likely to go home with someone I've just met when I've been drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. I am more likely to want sex after I've been drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Using alcohol makes me feel depressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Not Relevant	Not Appropriate	Redundant	Not Readable
30. I don't know what I'm doing when I've been drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Drinking makes my concentration poorer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. I'm more likely to go to a sex on premises venue if I've been drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. I don't think through the consequences of my actions when I'm drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Alcohol picks me up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. When I'm drinking I feel closer to people than I really am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. I am more hedonistic when I use alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. When using alcohol I have more adventurous sex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. I am more reflective when I've been drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. I'm more likely to assume the other person is the same HIV status when I've been drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. When I drink I feel heightened sensitivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. My awareness is reduced when I've been drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. I'm more likely to bareback if I've used alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. When I'm drinking I become less rational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. I make decisions about sex I would not make if not using alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Not Relevant	Not Appropriate	Redundant	Not Readable
45. I feel more stimulation and sensations during sex when I'm drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46. Drinking makes my erections better	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. I am less likely to ask for a condom if I've had alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. I'm more carefree when I'm drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. When drinking I am more forward with possible sexual partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. It's easier to relate to other people when I've been drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Alcohol helps to calm me and slow me down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52. I'm more confident when I've been drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53. Alcohol makes me more extroverted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54. I take risks I would not normally take when using alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55. I think less about decisions when I've been drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. I feel unmotivated or lazy when I use alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57. Drinking helps me to relax and wind down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. I let others know I'm attracted to them when I drink	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59. I'm easily lead when I've been drinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	<b>Not Relevant</b>	<b>Not Appropriate</b>	<b>Redundant</b>	<b>Not Readable</b>
60. I'm more sociable if I've been using alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Cannabis Questionnaire items*

	<b>Not Relevant</b>	<b>Not Appropriate</b>	<b>Redundant</b>	<b>Not Readable</b>
1. I feel numb when I use cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. When I use cannabis I'm less inhibited	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. My thinking is slowed down when I'm using cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Using cannabis makes me feel more sexy or sexual	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Using cannabis makes sex more enjoyable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I don't think clearly when using cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. When I use cannabis I am less choosy about sexual partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I let my partner make decisions for me about sex when using cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. When I use cannabis I can escape from my problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. When I use cannabis I feel more loving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. My mood is better when using cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. When I use cannabis I become paranoid or suspicious	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I feel more connected with other people after I've had cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Cannabis stops me from thinking too much	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I feel like I'm on a big high when using cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	<b>Not Relevant</b>	<b>Not Appropriate</b>	<b>Redundant</b>	<b>Not Readable</b>
16. I become less talkative when using cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Using cannabis makes me feel that I have something in common with other people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. When using cannabis my decision making abilities are impaired	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. I am more agreeable to decisions about sex when I'm using cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. When using cannabis I feel more sexually aroused	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Sex is better when using cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. When using cannabis I may not be aware of who I'm having sex with	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. I am more relaxed during sex when I've used cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Using cannabis makes me have more energy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. My sexual performance is impaired when using cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. When I use cannabis my body is more sensitive physically	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. My muscles are more relaxed when I use cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. I am more likely to want sex after I've used cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Using cannabis makes me feel irritable or upset	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. My thinking is tangential when I've used cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	<b>Not Relevant</b>	<b>Not Appropriate</b>	<b>Redundant</b>	<b>Not Readable</b>
31. Cannabis makes my concentration poorer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. It is easier to express myself during sex when I use cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. My emotions are heightened or magnified when using cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. When using cannabis I feel the need to be safe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. When I use cannabis I may think unsafe sex is ok at the time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. I am more hedonistic when I use cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. When using cannabis I have more adventurous sex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Using cannabis tends to make sex last longer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. I am less likely to discuss my HIV status during sex if I've used cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. When I use cannabis I feel heightened sensitivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. My awareness is reduced when I've had cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. I feel more comfortable when I've been using cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. When I use cannabis I avoid making decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. I make decisions about sex I would not make if not using cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. I feel more stimulation and sensations during sex when I use cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	<b>Not Relevant</b>	<b>Not Appropriate</b>	<b>Redundant</b>	<b>Not Readable</b>
46. Sex tends to be loving, sweet and warm when using cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. I am less likely to ask for a condom if I've had cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. I'm more carefree when I'm using cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. When I've had cannabis I am more forward with possible sexual partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. Cannabis makes me see things more clearly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Cannabis helps to calm me and slow me down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52. I have more energy when I've used cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53. Cannabis makes me more extroverted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54. It's easier to feel like I'm falling in love when I use cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55. When I use cannabis decisions about sex are often made in the moment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. I feel unmotivated or lazy when I use cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57. Cannabis helps me to relax and wind down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. I let others know I'm attracted to them when I use cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59. I'm easily lead when I've had cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60. I'm more sociable if I've been using cannabis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Amyl Nitrite Questionnaire items*

	<b>Not Relevant</b>	<b>Not Appropriate</b>	<b>Redundant</b>	<b>Not Readable</b>
1. I don't feel much when I use amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. When I use amyl I'm less inhibited	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. After using amyl I have increased visual stimulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. When using amyl I think a lot more about sex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Using amyl makes sex more enjoyable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I don't think clearly when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. When using amyl I feel more in the present moment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I let my partner make decisions for me about sex when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. My judgement becomes impaired when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. When I use amyl I feel more loving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. My mood is better when using amyl.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. When I use amyl I feel disappointed in myself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I feel more connected with other people after I've had amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Amyl makes me feel sick or nauseous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I feel like I'm on a big high when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	<b>Not Relevant</b>	<b>Not Appropriate</b>	<b>Redundant</b>	<b>Not Readable</b>
16. I am less talkative when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Using amyl makes me feel that I have more in common with other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. When using amyl my decision making abilities are impaired	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. I take risks I would not normally take when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. When using amyl I feel more horny or sexually aroused.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Sex is better when using amyl.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Sex is less painful when I've been using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Amyl makes me feel a loss of control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. I become disoriented when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. My sexual performance is impaired when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. When I use amyl my body is more sensitive physically	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. My muscles are more relaxed when I use amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. I am more likely to want sex after I've used amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Using amyl make me get headaches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. I make bad decisions when I use amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	<b>Not Relevant</b>	<b>Not Appropriate</b>	<b>Redundant</b>	<b>Not Readable</b>
31. Amyl makes my concentration poorer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. It is easier to express myself during sex when I use amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. I get hot flushes when I use amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. I can't interact with others when I'm using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. I am less aware of what others are doing sexually when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Amyl makes me feel orgasmic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. When using amyl I have more adventurous sex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Amyl makes it easier to express myself during sex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. I have stronger sexual desires when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. When I use amyl I feel heightened sensitivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. My awareness is reduced when I've had amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. Conversations are better when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. When I use amyl I avoid making decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. I make decisions about sex I wouldn't make if I wasn't using amyl.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. I feel more stimulation and sensations during sex when I use amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	<b>Not Relevant</b>	<b>Not Appropriate</b>	<b>Redundant</b>	<b>Not Readable</b>
46. My body tingles when I use amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. When I'm using amyl I feel closer to people than I really am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Stimulant Questionnaire items*

	<b>Not Relevant</b>	<b>Not Appropriate</b>	<b>Redundant</b>	<b>Not Readable</b>
1. I am able to act on instinct when I use stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. When I use stimulants I'm less inhibited	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Stimulants give me a greater need to be physical with other people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Using stimulants makes me feel agitated	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Stimulants make sex more enjoyable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I don't think clearly when using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. When I use stimulants I am less choosy about sexual partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Stimulants make me feel a loss of control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Stimulants make me see things more clearly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Stimulants help me to live in the moment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. My mood is better when I'm using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I'm more analytical when I use stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I feel more connected with other people after I've had stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Conversations are better when using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I make bad decisions when I use stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	<b>Not Relevant</b>	<b>Not Appropriate</b>	<b>Redundant</b>	<b>Not Readable</b>
16. I become less talkative when using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. My judgement becomes impaired when using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. When using stimulants my decision making abilities are impaired	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. I feel a sense of belonging when I use stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. When using stimulants I feel more horny or sexually aroused	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21 Sex is better when using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. When I'm using stimulants I think a lot more about sex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. I'm more likely to assume the other person is the same HIV status when I've been using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. I feel like I'm on a big high when using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. My sexual performance is impaired when using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. I throw caution to the wind when I use stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. I'm more likely to share sex toys if I've been using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. I am more likely to want sex after I've been using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Stimulants makes me feel depressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. I don't know what I'm doing when I've been using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	<b>Not Relevant</b>	<b>Not Appropriate</b>	<b>Redundant</b>	<b>Not Readable</b>
31. When I use stimulants I become paranoid or suspicious	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. I'm more likely to go to a sex on premises venue if I've been using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Using stimulants tend to make sex last longer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. It is easier to express myself during sex when I use stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Stimulants impair my perception	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Stimulants help me to stay focussed on sex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. When using stimulants I have more adventurous sex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Using stimulants makes me feel more sexy or sexual	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Stimulants make me think everything is good	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. When I use stimulants I feel heightened sensitivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. My awareness is reduced when I've been using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. I'm more likely to bareback if I've used stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. When I'm using stimulants I become less rational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. I make decisions about sex I would not make if not using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. I feel more stimulation and sensations during sex when I'm using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	<b>Not Relevant</b>	<b>Not Appropriate</b>	<b>Redundant</b>	<b>Not Readable</b>
46. Stimulants give me a false sense of well-being	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. I am less likely to ask for a condom if I've had stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. My emotions are heightened or magnified when using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49. When using stimulants I am more forward with possible sexual partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. I have stronger sexual desires when using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Stimulants make me have more energy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52. I'm more confident when I've been using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53. Stimulants make me more extroverted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54. I feel scattered when I use stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55. I am more likely to have a three-some when I've been using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. Stimulants make me emotionally reserved	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57. I feel self-loathing and self-critical when I use stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. I let others know I'm attracted to them when I use stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59. When I use stimulants I avoid making decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60. I'm more sociable if I've been using stimulants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Appendix C: Participant information sheet, group discussion**

<b>QUEENSLAND UNIVERSITY OF TECHNOLOGY</b>
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and

<b>THE PRINCE CHARLES HOSPITAL HEALTH SERVICE DISTRICT</b>
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**PARTICIPANT INFORMATION SHEET**

**BELIEFS ABOUT THE AFFECTS OF ALCOHOL AND DRUG USE  
AMONG GAY/BISEXUAL MEN  
(small group discussion version)**

**Human Research Ethics Proposal No: TPCHEC2436 & QUT 3463H**  
**Researchers: Amy Mullens (School of Psychology & Counselling and Queensland Health),  
 Professor Ross Young (School of Psychology & Counselling), Elisabeth Hamernik  
 (Queensland Health) and Professor Michael Dunne (School of Public Health)**

You are invited to participate in a joint research project between Queensland University of Technology and Queensland Health. This project is looking at beliefs about the effects of alcohol and drug use. You have been invited to participate because you are a gay or bisexual male and received information regarding this study at the Gladstone Road Medical Centre or from a friend. As we work through this information sheet, please feel free to ask any questions you may have concerning this project.

Some research has demonstrated that our beliefs about the impact of alcohol and drug use can impact the way we think, feel and behave. The purpose of this project is to help increase our understanding about these beliefs and how they relate to the maintenance of health. We are interested in hearing your opinions during a focus group. The focus group should last approximately two hours and will include up to eight other people. The focus groups will be guided by discussion questions that will ask you about how alcohol and/or drugs use affects you. You will be paid \$20 to help reimburse your travel expenses. We hope to present the overall findings at a national conference.

Although the project is directed to the expansion of knowledge generally, it may not result in any direct benefit to you. You may experience some anxiety during participation, although risks are comparable to that of day-to-day living. Risks will be reduced by allowing you to debrief as needed with the researcher, who is a registered psychologist or receive a referral to an appropriate counselling agency. Your doctor will not have access to the questionnaires once you have completed them. Any information you provide will remain confidential and will be disclosed only with your permission. You do not need to participate in this study, and you are free to say no. Your participation is voluntary. Should you not wish to participate or withdraw from the project your treatment and care at this clinic will not be affected in any way. If you have any concerns or complaints, you may contact the Research Ethics Officer at Queensland University of Technology on 3864-2340. This project has been reviewed by The Prince Charles Hospital and Queensland University of Technology Ethics Committees. If you require more information before, during or after this project you may contact:

Amy Mullens (Chief Investigator) Clinical Psychologist 2 <sup>nd</sup> Floor Biala 270 Roma Street Brisbane, Qld 4000 (07) 3227-6394	Research Coordinator Secretary or the Chairperson The Prince Charles Hospital Research & Ethics Committee Rode Road Chermside, Qld 4032 (07) 3350-8500	Research Ethics Officer QUT Office of Research Level 3, O Block Podium Gardens Point Campus Kelvin Grove, Qld 4059 (07) 3864-2340
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Thank you for your cooperation and participation.

**Appendix D: Participant information sheet, interviews**

**QUEENSLAND UNIVERSITY OF TECHNOLOGY**

**and**

**THE PRINCE CHARLES HOSPITAL HEALTH SERVICE DISTRICT**

**PARTICIPANT INFORMATION SHEET**

**BELIEFS ABOUT THE AFFECTS OF ALCOHOL AND DRUG USE  
AMONG GAY/BISEXUAL MEN**  
*(interview version)*

**Human Research Ethics Proposal No: TPCH EC2436 & QUT 3463H**

**Researchers: Amy Mullens (School of Psychology & Counselling and Queensland Health),  
Professor Ross Young (School of Psychology & Counselling), Elisabeth Hamernik  
(Queensland Health) and Professor Michael Dunne (School of Public Health)**

You are invited to participate in a joint research project between Queensland University of Technology and Queensland Health. This project is looking at beliefs about the effects of alcohol and drug use. You have been invited to participate because you are a gay or bisexual male and received information regarding this study at the Gladstone Road Medical Centre or from a friend. As we work through this information sheet, please feel free to ask any questions you may have concerning this project.

Some research has demonstrated that our beliefs about the impact of alcohol and drug use can impact the way we think, feel and behave. It is hoped that this project will help to increase understanding of these beliefs and their relationship to the maintenance of health. The interview should last approximately 10 minutes. During the interview, you will be asked questions about how you believe alcohol and/or drug use affects you.

Although the project is directed to the expansion of knowledge generally, it may not result in any direct benefit to you. You may experience some anxiety during participation, although risks are comparable to that of day-to-day living. Risks will be reduced by allowing you to debrief as needed with the researcher, who is a registered psychologist or receive a referral to an appropriate counselling agency.

Your doctor will not have access to the questionnaires once you have completed them. Any information you provide will remain confidential and will be disclosed only with your permission. You do not need to participate in this study, and you are free to say no. Your participation is voluntary. Should you not wish to participate or withdraw from the project your treatment and care at this clinic will not be affected in any way. If you have any concerns or complaints, you may contact the Research Ethics Officer at Queensland University of Technology on 3864-2340. This project has been reviewed by The Prince Charles Hospital and Queensland University of Technology Ethics Committees. If you require more information before, during or after this project you may contact:

Amy Mullens  
(Chief Investigator)  
Clinical Psychologist  
2<sup>nd</sup> Floor Biala  
270 Roma Street  
Brisbane, Qld 4000  
(07) 3227-6394

Research Coordinator  
Secretary or the Chairperson  
The Prince Charles Hospital  
Research & Ethics Committee  
Rode Road  
Chermside, Qld 4032  
(07) 3350-8500

Research Ethics Officer  
QUT  
Office of Research  
Level 3, O Block Podium  
Gardens Point Campus  
Kelvin Grove, Qld 4059  
(07) 3864-2340

Thank you for your cooperation and participation.

**Appendix E: Consent form (Phase 1)**

<p><b>QUEENSLAND UNIVERSITY OF TECHNOLOGY</b></p> <p><b>and</b></p> <p><b>THE PRINCE CHARLES HOSPITAL HEALTH SERVICE DISTRICT</b></p>
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**CONSENT FORM****BELIEFS ABOUT THE AFFECTS OF ALCOHOL AND DRUG USE  
AMONG GAY/BISEXUAL MEN**

**Human Research Ethics Proposal No: TPCH EC2436 & QUT 3463H**  
**Researchers: Ms Amy Mullens, Professor Ross Young, Ms Elisabeth Hamernik and**  
**Associate Professor Michael Dunne**

**Participant's name:** \_\_\_\_\_ **D.O.B.:** \_\_\_\_\_

I agree to participate in the above named project and in so doing acknowledge that:

1. I have read the attached Patient Information Sheet outlining the nature and purpose of the project and the extent of my involvement, and have had these details explained to me. I have had the opportunity to ask further questions and am satisfied that I understand.
2. I am aware that, although the project is directed to the expansion of knowledge generally, it may not result in any direct benefit to me.
3. I have been informed that I may withdraw from the project at my request at any time.
4. I have been advised that the District Manager, on recommendation from The Prince Charles Hospital and Queensland University of Technology Research and Ethics Committees, have given approval for this project to proceed.
5. I am aware that I may request further information about the project as it proceeds.

I understand that none of the project data will identify me or the contents of my medical record to a third party.

I understand that, in respect of any information obtained during the course of the project, confidentiality will be maintained to the same extent as for any medical records and that, in the event of any results of the project being published, I will not be identified in any way.

*Signature of participant*

*Please print name*

*Date*

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*Signature of witness*

*Please print name*

*Date*

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**Appendix F: Participant information sheet (Phase 2)**

<b>QUEENSLAND UNIVERSITY OF TECHNOLOGY</b>
<b>and</b>
<b>THE PRINCE CHARLES HOSPITAL HEALTH SERVICE DISTRICT</b>

**BELIEFS ABOUT THE EFFECTS OF ALCOHOL AND DRUG USE  
AMONG GAY/BISEXUAL MEN**

**Human Research Ethics Proposal No: TPCHEC2436 & QUT 3463H**

**Amy Mullens (Institute of Health and Biomedical Innovation and Queensland Health), Dr Joe Debattista (Queensland Health), Professor Ross Young (Institute of Health and Biomedical Innovation) and Professor Michael Dunne (Institute of Health and Biomedical Innovation)**

You are invited to participate in a joint research project between Queensland University of Technology and Queensland Health and it is part of a PhD project. This project is looking at beliefs about the effects of alcohol and drug use. You have been invited to participate because you are a gay or bisexual male and have responded to an advertisement about the project. If you have any questions about this project as you read through this information sheet, please contact the project coordinator (Amy Mullens at [ab.mullens@qut.edu.au](mailto:ab.mullens@qut.edu.au)).

Some research has demonstrated that our beliefs about the impact of alcohol and drug use can impact the way we think, feel and behave. The purpose of this project is to help increase our understanding about these beliefs and how they relate to the maintenance of health. We are interested in hearing your opinions during an on-line survey. The survey should last approximately 15-45 minutes. During the interview, you will be asked questions about how you believe alcohol and/or drug use affects you. We hope to present our findings at a national conference. Any data obtained will be de-identified for the purposes of presentations and/or publications.

Although the project is directed to the expansion of knowledge generally, it may not result in any direct benefit to you. You may experience some anxiety during participation, although risks are comparable to that of day-to-day living. Risks will be reduced by allowing you to contact the project coordinator (Amy Mullens at [ab.mullens@qut.edu.au](mailto:ab.mullens@qut.edu.au)), who is a registered psychologist to debrief or discuss a referral to an appropriate counselling agency. For immediate counselling you can contact Lifeline on 131114.

Any information you provide will remain confidential and will be disclosed only with your permission. Any written materials or tapes will be stored in a locked filing cabinet in a locked room and will be destroyed upon final analysis of the data. You do not need to participate in this study, and you are free to say no. Your participation is voluntary. If you do not wish to participate or withdraw from the project and stop completing the survey at anytime.

If you have any concerns or complaints, you may contact the Mr Phillip Lee (Research Coordinator) at The Prince Charles Hospital or the Research Ethics Officer at Queensland University of Technology. This project has been reviewed by The Prince Charles Hospital and Queensland University of Technology Ethics Committees. If you require more information before, during or after this project you may contact:

Amy Mullens  
(Chief Investigator)  
Clinical Psychologist  
2<sup>nd</sup> Floor Biala  
270 Roma Street  
Brisbane, Qld 4000  
(07) 3227-6394

Research Coordinator  
Secretary or the Chairperson  
The Prince Charles Hospital  
Research & Ethics Committee  
Rode Road  
Chermside, Qld 4032  
(07) 3350-8500

Research Ethics Officer  
QUT  
Office of Research  
Level 3, O Block Podium  
Gardens Point Campus  
Kelvin Grove, Qld 4059  
(07) 3864-2340

**Appendix G: Consent form (Phase 2)****QUEENSLAND UNIVERSITY OF TECHNOLOGY****and****THE PRINCE CHARLES HOSPITAL HEALTH SERVICE DISTRICT****CONSENT FORM****BELIEFS ABOUT THE EFFECTS OF ALCOHOL AND DRUG USE  
AMONG GAY/BISEXUAL MEN**

**Human Research Ethics Proposal No: TPCH EC2436 & QUT 3463H  
Amy Mullens (Institute of Health and Biomedical Innovation and Queensland Health),  
Dr. Joe Debattista (Queensland Health), Professor Ross Young (Institute of Health and  
Biomedical Innovation) and Professor Michael Dunne (Institute of Health and  
Biomedical Innovation)**

**Participant's name:** \_\_\_\_\_ **D.O.B.:** \_\_\_\_\_

I agree to participate in the above named project and in so doing acknowledge that:

1. I have read the attached Patient Information Sheet outlining the nature and purpose of the project and the extent of my involvement, and have had these details explained to me. I have had the opportunity to ask further questions and am satisfied that I understand.
2. I am aware that, although the project is directed to the expansion of knowledge generally, it may not result in any direct benefit to me.
3. I have been informed that I may withdraw from the project at my request at any time.
4. I have been advised that the District Manager, on recommendation from The Prince Charles Hospital and Queensland University of Technology Research and Ethics Committees, have given approval for this project to proceed.
5. I am aware that I may request further information about the project as it proceeds.

I understand that none of the project data will identify me or the contents of my medical record to a third party.

I understand that, in respect of any information obtained during the course of the project, confidentiality will be maintained to the same extent as for any medical records and that, in the event of any results of the project being published, I will not be identified in any way.

*\*Participants are to click the box (preceding the online questionnaire) to acknowledge they have read/understand/consented to above information.*

**Appendix H: Participant information sheet and consent form (Phase 3)*****PARTICIPANT INFORMATION***  
Queensland University of Technology

You are invited to participate in a joint research project through Queensland University of Technology, which is part of a PhD project, supervised by Professor Ross Young, Professor Michael Dunne, Dr Joe Debattista and Mr Graham Norton. This project is looking at beliefs about the effects of alcohol and drug use. You have been invited to participate because you are a gay man, bisexual man or other man who has sex with men, you are 18 or older, and have responded to an advertisement about the project. If you have any questions about this project as you read through this information sheet, please contact the project coordinator (Amy Mullens at [ab.mullens@student.qut.edu.au](mailto:ab.mullens@student.qut.edu.au)).

Some research has demonstrated that our beliefs about the impact of alcohol and drug use can impact the way we think, feel and behave. The purpose of this project is to help increase our understanding about these beliefs and how they relate to the maintenance of health. We are interested in hearing you opinions during an on-line survey. The survey should last approximately 20 minutes. It may be slightly longer for participants who have experience with a wider range of drugs. During the survey you will be asked questions about how you believe alcohol and/or drugs effect you. We hope to present our findings at a national conference. Any data obtained will be de-identified for the purposes of presentations and/or publications.

Although the project is directed to the expansion of knowledge generally, it may not result in any direct benefit to you. You may experience some anxiety during participation, although risks are comparable to that of day-to-day living. Risks will be reduced by allowing you to contact the project coordinator (Amy Mullens at [ab.mullens@student.qut.edu.au](mailto:ab.mullens@student.qut.edu.au)) to debrief or discuss a referral to an appropriate counselling agency. For immediate telephone counselling you can contact Lifeline on 13 1114.

Any information you provide will remain confidential and will be disclosed only with your permission. Any data or materials will be stored in a locked filing cabinet in a locked room and will be destroyed upon final analysis of the data. You do not need to participate in this study, and you are free to say no. Your participation is voluntary. If you do not wish to participate you can withdraw from the project and stop completing the survey at anytime.

If you have any concerns or complaints, you may contact the Research Ethics Officer at Queensland University of Technology. This project has been reviewed by the Queensland University of Technology Ethics Committee. If you require more information before, during or after this project you may contact:

Amy Mullens (Project Coordinator), [ab.mullens@student.qut.edu.au](mailto:ab.mullens@student.qut.edu.au)

Research Ethics Officer, Queensland University of Technology, Office of Research  
Level 3, O Block Podium  
Gardens Point Campus  
Brisbane, Qld 4000  
(07) 3864-2340

Thanks for your help!!

\*Participants are to click the box (preceding the online questionnaire) to acknowledge they have read/understand/consented to above information

**Appendix I: Demographics form (Phase 1)****BELIEFS ABOUT THE EFFECTS OF ALCOHOL AND DRUG USE  
AMONG GAY/BISEXUAL MEN***Demographics and Substance Use History*

1. Date of birth (day/month/year): \_\_\_\_\_
  
2. Relationship status (please tick):
  - Single
  - Defacto
  - Married
  - Separated
  - Divorced
  - Widow
  - Other \_\_\_\_\_
  
3. Employment status (please tick):
  - Employed full-time
  - Employed part-time
  - Self-employed
  - Unemployed
  - Pension/Benefit
  - Student
  - Home Duties
  - Retired
  - Other \_\_\_\_\_
  
4. What is your usual occupation? \_\_\_\_\_
  
5. Number of years of education: \_\_\_\_\_

6. Which of the following substances have you used (*please tick each item for both time periods*):

	<b>In the past 3 months</b>	<b>In your lifetime</b>
a. Marijuana	_____	_____
b. Alcohol	_____	_____
c. Amyl/"Poppers"	_____	_____
d. Amphetamines	_____	_____
e. Cocaine	_____	_____
f. Heroin	_____	_____
g. Ecstasy	_____	_____
h. LSD/Acid	_____	_____
i. Tobacco	_____	_____
j. Others*	_____	_____

7. \*If you said "yes" to "other" drugs: Please specify which "other" drugs you have used in the past 3 months. \_\_\_\_\_

8. Which "other" drugs have you used in your lifetime?  
\_\_\_\_\_

9. Have you had alcohol in the past 30 days? Yes/No (*please circle*) If Yes, How many times have you had alcohol in the past 30 days? \_\_\_\_\_

How much alcohol do you usually have? \_\_\_\_\_ standard drinks  
(*one standard drink = middy/stubby = beer = small glass of wine = 1 nip spirits*)

10. Have you used marijuana in the past 30 days? Yes/No (*please circle*) If Yes, How many times have you used marijuana in the past 30 days? \_\_\_\_\_

How much marijuana do you usually have? \_\_\_\_\_ cones/joints (*please circle*)

11. Have you used amyl in the past 30 days? Yes/No (*please circle*) If Yes, How many times have you used amyl in the past 30 days? \_\_\_\_\_

How many hits do you usually have? \_\_\_\_\_

12. Have you used any stimulants (speed, ecstasy, crystal meth) in the past 30 days? Yes/No (*please circle*) If Yes, How many times have you used stimulants in the past 30 days? \_\_\_\_\_

What do you usually have? \_\_\_\_\_

How much do you usually have? \_\_\_\_\_ grams/tabs/hits (*please circle*)

**Appendix J: Small group discussion questions (Phase 1)****BELIEFS ABOUT THE AFFECTS OF ALCOHOL AND DRUG USE  
AMONG GAY/BISEXUAL MEN***Small Group Discussion Questions*

1. How does your use of alcohol or other drugs affect you?
2. What do you enjoy about using alcohol or other drugs?
3. What do you not enjoy about using alcohol or other drugs?
4. How does your use of alcohol or other drugs impact your feelings/emotions or mood?
5. How does your use of alcohol or other drugs affect how you feel physically?
6. How does your use of alcohol or other drugs impact your thinking?
7. How does your use of alcohol or other drugs affect what activities you engage in?
8. How does your use of alcohol or other drugs impact your interactions with other people?
9. How does your use of alcohol or other drugs impact your ability to make decisions?
10. Do you expect most people in venues that you may frequent (e.g., bars or sex on premises venues) to be using alcohol or other drugs?
11. How does using alcohol and/or other drugs in combination with other drugs affect you? (Additional prompts: How often are alcohol and other drugs used in combination? Under what circumstances do you or others you know combine alcohol and other drugs? What are the most common combinations?)
12. How does your use of alcohol and drugs use impact on your sexual behaviours?

**Appendix K: Interview questions (Phase 1)****BELIEFS ABOUT THE AFFECTS OF ALCOHOL AND DRUG USE ON  
SEXUAL ACTIVITY AMONG GAY/BISEXUAL MEN***Interview Questions*

The use of marijuana, alcohol, stimulants and amyl and sex in gay and bisexual men has not received much attention. We are interested in your opinions regarding these substances so that we can better meet the health needs of gay and bisexual men. I am going to ask your opinions regarding the affects of these substances one by one, starting with marijuana. Some people may find discussing these issues embarrassing. Please feel free to let me know if there are any questions that you do not wish to answer.

1. How does using marijuana affect your emotions or mood?
2. How does using marijuana affect how you think and your ability to think clearly?
3. How does using marijuana affect how your body feels when having sex?
4. How does using marijuana affect what sort what types of sex you get involved in (e.g., venue, type of partner, sexual safety, etc)?
5. How does using marijuana influence how you get along with others?
6. How does using marijuana influence your ability to make decisions about sex?
  
7. How does using alcohol affect your emotions or mood?
8. How does using alcohol affect how you think and your ability to think clearly?
9. How does using alcohol affect how your body feels when having sex?
10. How does using alcohol affect what sort what types of sex you get involved in?
11. How does using alcohol influence how you get along with others?
12. How does using alcohol influence your ability to make decisions about sex?
  
13. How does using amyl affect your emotions or mood?
14. How does using amyl affect how you think and your ability to think clearly?
15. How does using amyl affect how your body feels when having sex?
16. How does using amyl affect what sort what types of sex you get involved in?
17. How does using amyl influence how you get along with others?
18. How does using amyl influence your ability to make decisions about sex?
  
19. How does using stimulants affect your emotions or mood?
20. How does using stimulants affect how you think and your ability to think clearly?
21. How does using stimulants affect how your body feels when having sex?
22. How does using stimulants affect what sort what types of sex you get involved in?
23. How does using stimulants influence how you get along with others?
24. How does using stimulants influence your ability to make decisions about sex?

**Appendix L: Demographics and substance use history form (Phase 2)**

(Text included in the online questionnaire version)

**BELIEFS ABOUT THE EFFECTS OF ALCOHOL AND DRUG USE  
AMONG GAY/BISEXUAL MEN***Demographics and Substance Use History*

1. Age: \_\_\_\_\_
2. Relationship status (*please tick*):
  - Single
  - Married/Defacto with a man
  - Married/Defacto with a woman
  - Separated
  - Divorced
  - Widow
  - Other (*please specify*) \_\_\_\_\_
3. Employment status (*please tick*):
  - Employed full-time
  - Employed part-time
  - Self-employed
  - Unemployed
  - Pension/Benefit
  - Student
  - Home Duties
  - Retired
  - Other (*please specify*) \_\_\_\_\_
4. What is your usual occupation? \_\_\_\_\_
5. Number of years of education: \_\_\_\_\_
6. *Please tick all that apply*:
  - a)  Less than Year 10
  - b)  Finished Year 10
  - c)  Finished Year 12
  - d)  TAFE course/certificate
  - e)  Started University, but did not complete
  - f)  University graduate
  - g)  Post-graduate studies

7. How do you identify:

- a) \_\_\_gay/homosexual
- b) \_\_\_straight/heterosexual
- c) \_\_\_bisexual
- d) \_\_\_unsure
- e) \_\_\_other (*please specify*) \_\_\_\_\_

8. Which of the following substances have you used (*please tick each item for both time periods*):

	<b>In the past 3 months</b>	<b>In your lifetime</b>
Marijuana	_____	_____
Alcohol	_____	_____
Amyl	_____	_____
Amphetamines	_____	_____
Barbituates	_____	_____
Bulbs	_____	_____
Cocaine	_____	_____
Heroin	_____	_____
Ecstasy	_____	_____
LSD/Acid	_____	_____
Mushrooms	_____	_____
Tobacco	_____	_____
Prescription meds (for recreational use) <i>Examples: Valium, OxyContin, Viagra*</i>	_____	_____
Special K or Ketamine	_____	_____
Others**	_____	_____

\*\*If you said “yes” to any “other” drugs: Please specify which “other” drugs you have used in the past 3 months. \_\_\_\_\_

Which “other” drugs have you used in your lifetime? \_\_\_\_\_

\_\_\_\_\_

If they said yes to “m”—which prescription meds? \_\_\_\_\_

9. Have you had alcohol in the past 30 days? Yes/No (*please circle*) If Yes, How many times have you had alcohol in the past 30 days? \_\_\_\_\_

How much alcohol do you usually have? \_\_\_\_\_ standard drinks  
(one standard drink = middy/stubby = beer = small glass of wine = 1 nip spirits)

10. Have you used marijuana in the past 30 days? Yes/No (*please circle*) If Yes, How many times have you used marijuana in the past 30 days? \_\_\_\_\_

How much marijuana do you usually have? \_\_\_\_\_ cones/joints (*please circle*)

11. Have you used amyl/butyl nitrate/"poppers" in the past 30 days? Yes/No (*please circle*) If Yes, How many times have you used "poppers" in the past 30 days? \_\_\_\_\_

How many hits do you usually have? \_\_\_\_\_

12. Have you used any stimulants (speed, ecstasy, crystal meth) in the past 30 days? Yes/No (*please circle*) If Yes, How many times have you used stimulants in the past 30 days? \_\_\_\_\_

What/how much do you usually have? \_\_\_\_\_ grams/tabs/hits (*please circle*)

**Appendix M: Questionnaire protocol (Phase 2)***DEQ-MSM (draft version)*

PLEASE RATE THESE STATEMENTS BASED ON *YOUR* BELIEFS ABOUT ALCOHOL

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	2	3	4	5

	1	2	3	4	5
1. Drinking makes me feel numb	<input type="checkbox"/>				
2. I feel less inhibited when I drink	<input type="checkbox"/>				
3. I feel more relaxed when drinking	<input type="checkbox"/>				
4. When I drink I do things that I regret	<input type="checkbox"/>				
5. I don't think before I speak when I'm drinking	<input type="checkbox"/>				
6. I don't think clearly when I'm drinking	<input type="checkbox"/>				
7. When I drink I am less choosy about sexual partners	<input type="checkbox"/>				
8. When I've been drinking I may not be aware if a condom was used during sex	<input type="checkbox"/>				
9. Drinking helps me to escape from my problems	<input type="checkbox"/>				
10. I'm more likely to have risky sex when I've been drinking	<input type="checkbox"/>				
11. My mood is better when I've been drinking	<input type="checkbox"/>				

	1	2	3	4	5
12. I'm more likely to go looking for sex when I've been drinking	<input type="checkbox"/>				
13. I feel more connected with other people when I drink	<input type="checkbox"/>				
14. I let my guard down when I've been drinking	<input type="checkbox"/>				
15. I'm more likely to make bad decisions when I drink	<input type="checkbox"/>				
16. I'm more sociable if I've been drinking	<input type="checkbox"/>				
17. My judgement can become impaired when I've been drinking	<input type="checkbox"/>				
18. I feel more stimulation during sex when I'm drinking	<input type="checkbox"/>				
19. I'm more likely to let others know I'm attracted to them when I'm drinking	<input type="checkbox"/>				
20. When I'm drinking I feel more horny or sexually aroused	<input type="checkbox"/>				
21. Sex is better when I've been drinking	<input type="checkbox"/>				
22. I'm more likely to make unsafe decisions about sex when I'm drinking	<input type="checkbox"/>				
23. I feel more relaxed during sex when I've been drinking	<input type="checkbox"/>				
24. Anal sex is less painful when I've been drinking	<input type="checkbox"/>				
25. I think about sex more often when I'm drinking	<input type="checkbox"/>				
26. I take risks I would not normally take when drinking	<input type="checkbox"/>				
27. I'm more likely to have sex without a condom when I've been drinking	<input type="checkbox"/>				

	1	2	3	4	5
28. I'm less likely to discuss my/my partner's HIV status with my partner during sex when I'm drinking	<input type="checkbox"/>				
29. Drinking makes my sexual performance better	<input type="checkbox"/>				
30. I'm less aware of what I'm doing when I've been drinking	<input type="checkbox"/>				
31. Drinking makes it difficult for me to concentrate	<input type="checkbox"/>				
32. I'm more confident when I've been drinking	<input type="checkbox"/>				
33. I don't think through the consequences of my actions when I'm drinking	<input type="checkbox"/>				
34. When I'm drinking I'm more forward with possible sexual partners	<input type="checkbox"/>				
35. I become less rational when I'm drinking	<input type="checkbox"/>				
36. It's easier to relate to other people when I've been drinking	<input type="checkbox"/>				
37. I have more adventurous sex when I've been drinking	<input type="checkbox"/>				
38. Drinking helps calm me to down	<input type="checkbox"/>				
39. Drinking helps me to live in the moment	<input type="checkbox"/>				
40. When I drink my body is more physical sensitive	<input type="checkbox"/>				
41. I'm less able to ask for/discuss condoms during sex when drinking	<input type="checkbox"/>				
42. I feel more accepted by others when I drink	<input type="checkbox"/>				
43. I throw caution to the wind when I drink	<input type="checkbox"/>				

	1	2	3	4	5
44. When I drink I may think unsafe sex is ok at the time	<input type="checkbox"/>				
45. I feel more carefree when I'm drinking	<input type="checkbox"/>				

*CEQ-MSM (draft version)*

PLEASE RATE THESE STATEMENTS BASED ON **YOUR** BELIEFS ABOUT  
CANNABIS (MARIJUANA/POT/DOPE)

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	2	3	4	5

	1	2	3	4	5
1. Using cannabis makes me feel numb	<input type="checkbox"/>				
2. I feel less inhibited when using cannabis	<input type="checkbox"/>				
3. Using cannabis makes it difficult for me to concentrate	<input type="checkbox"/>				
4. My emotions are heightened when using cannabis	<input type="checkbox"/>				
5. I'm more sociable if I've been using cannabis	<input type="checkbox"/>				
6. I don't think clearly when using cannabis	<input type="checkbox"/>				
7. Cannabis makes me more outgoing	<input type="checkbox"/>				
8. Sex is better when I've been using cannabis	<input type="checkbox"/>				
9. Using cannabis helps me to escape from my problems	<input type="checkbox"/>				
10. When I use cannabis I feel more loving	<input type="checkbox"/>				
11. My mood is better when using cannabis	<input type="checkbox"/>				
12. I can become paranoid or suspicious after using cannabis	<input type="checkbox"/>				

	1	2	3	4	5
13. I feel more connected with other people when I use cannabis	<input type="checkbox"/>				
14. Cannabis stops me from thinking too much	<input type="checkbox"/>				
15. I'm on a big high when using cannabis	<input type="checkbox"/>				
16. I am less talkative when using cannabis	<input type="checkbox"/>				
17. I feel more accepted by others when I use cannabis	<input type="checkbox"/>				
18. I'm more likely to make bad decisions when I'm using cannabis	<input type="checkbox"/>				
19. I am more agreeable to decisions about sex when I'm using cannabis	<input type="checkbox"/>				
20. I feel more relaxed when using cannabis	<input type="checkbox"/>				
21. I feel more carefree when I'm using cannabis	<input type="checkbox"/>				
22. When using cannabis I may not be aware of who I'm having sex with	<input type="checkbox"/>				
23. I feel more relaxed during sex when I've used cannabis	<input type="checkbox"/>				
24. It's easier to feel like I'm falling in love when I use cannabis	<input type="checkbox"/>				
25. My sexual performance is enhanced when using cannabis	<input type="checkbox"/>				
26. I let sexual partners make decisions for me when using cannabis	<input type="checkbox"/>				
27. When I use cannabis my body is more physically sensitive	<input type="checkbox"/>				
28. I think about sex more often when I'm using cannabis	<input type="checkbox"/>				

	1	2	3	4	5
29. When I use cannabis I am less choosy about sexual partners	<input type="checkbox"/>				
30. I am less likely to ask for/discuss condoms if I've had cannabis	<input type="checkbox"/>				
31. When using cannabis I feel more horny or sexually aroused	<input type="checkbox"/>				
32. It's easier to express my sexual needs or desires when I use cannabis	<input type="checkbox"/>				
33. I'm more likely to let others know I'm attracted to them when I use cannabis	<input type="checkbox"/>				
34. When using cannabis I am more forward with possible sexual partners	<input type="checkbox"/>				
35. When I use cannabis I may think unsafe sex is ok at the time	<input type="checkbox"/>				
36. Sex tends to be more loving when using cannabis	<input type="checkbox"/>				
37. I have more adventurous sex when using cannabis	<input type="checkbox"/>				
38. Using cannabis makes sex last longer	<input type="checkbox"/>				
39. I'm less aware of what I'm doing when using cannabis	<input type="checkbox"/>				
40. Decisions about sex are made in the moment when I use cannabis	<input type="checkbox"/>				
41. I make decisions about sex I would not make if not using cannabis	<input type="checkbox"/>				
42. I'm more likely to have sex without a condom when I've been using cannabis	<input type="checkbox"/>				
43. I'm more likely to go looking for sex when I've been using cannabis	<input type="checkbox"/>				
44. I'm less likely to discuss my/my partner's HIV status with my partner during sex when using cannabis	<input type="checkbox"/>				

*AEQ-MSM (draft version)*

PLEASE RATE THESE STATEMENTS BASED ON ***YOUR*** BELIEFS ABOUT  
AMYL

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	
1	2	3	4	5	
	1	2	3	4	5
1. I'm more likely to make bad decisions when I use amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I feel less inhibited when I use amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I'm less aware of what I'm doing when I use amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Using amyl makes it difficult for me to concentrate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I am more likely to want sex when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I don't think clearly when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I have more adventurous sex when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I let sexual partners make decisions for me when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. My judgement can become impaired when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. When I use amyl I feel more loving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. My mood is better when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I'm more likely to make unsafe decisions about sex when using amyl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	1	2	3	4	5
13. I feel more connected with other people when I use amyl	<input type="checkbox"/>				
14. I am less aware of my partners actions during sex when using amyl	<input type="checkbox"/>				
15. I'm on a big high when using amyl	<input type="checkbox"/>				
16. I am less talkative when using amyl	<input type="checkbox"/>				
17. When using amyl I feel more horny or sexually aroused	<input type="checkbox"/>				
18. I feel more accepted by others when I use amyl	<input type="checkbox"/>				
19. I take risks I wouldn't normally take when using amyl	<input type="checkbox"/>				
20. Sex is better when using amyl	<input type="checkbox"/>				
21 I feel more relaxed when using amyl	<input type="checkbox"/>				
22. Anal sex is less painful when using amyl	<input type="checkbox"/>				
23. I feel less in control when using amyl	<input type="checkbox"/>				
24. I feel disoriented when using amyl	<input type="checkbox"/>				
25. My sexual performance is enhanced when using amyl	<input type="checkbox"/>				
26. When I use amyl my body is more physically sensitive	<input type="checkbox"/>				
27. I have stronger sexual desires when using amyl	<input type="checkbox"/>				
28. Interacting with others is more difficult when using amyl	<input type="checkbox"/>				

	1	2	3	4	5
29. It is easier to express my sexual needs or desires when I use amyl	<input type="checkbox"/>				
31. I'm more likely to go looking for sex when I've been using amyl	<input type="checkbox"/>				
32. I am less likely to ask for/discuss condoms if I've been using amyl	<input type="checkbox"/>				
33. I'm more likely to have sex without a condom when using amyl	<input type="checkbox"/>				
34. When I use amyl I may think unsafe sex is ok at the time	<input type="checkbox"/>				
35. I'm less likely to discuss my/my partner's HIV status with my partner during sex when using amyl	<input type="checkbox"/>				

*SEQ-MSM (draft version)*

PLEASE RATE THESE STATEMENTS BASED ON **YOUR** BELIEFS ABOUT  
STIMULANTS (AMPHETAMINES/SPEED/GOEY/ECSTASY/CRYSTAL  
METH/TINA/ICE)

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	2	3	4	5

	1	2	3	4	5
1. Stimulants give me more energy	<input type="checkbox"/>				
2. I feel less inhibited when I use stimulants	<input type="checkbox"/>				
3. Stimulants give me a greater need to be physical with others	<input type="checkbox"/>				
4. I feel more agitated when I use stimulants	<input type="checkbox"/>				
5. Sex is better when using stimulants	<input type="checkbox"/>				
6. I don't think clearly when using stimulants	<input type="checkbox"/>				
7. I become less talkative when using stimulants	<input type="checkbox"/>				
8. I feel less in control when using stimulants	<input type="checkbox"/>				
9. I see things more clearly when I use stimulants	<input type="checkbox"/>				
9. Using stimulants helps me to live in the moment	<input type="checkbox"/>				
10. My mood is better when I'm using stimulants	<input type="checkbox"/>				
11. I'm more sociable if I've been using stimulants	<input type="checkbox"/>				

	1	2	3	4	5
13. I think a lot more about sex when using stimulants	<input type="checkbox"/>				
13. Conversations are better when using stimulants	<input type="checkbox"/>				
14. I'm on a big high when using stimulants	<input type="checkbox"/>				
15. I throw caution to the wind when I use stimulants	<input type="checkbox"/>				
16. Using stimulants makes sex last longer	<input type="checkbox"/>				
17. I am less likely to ask for/discuss condoms if I've been using stimulants	<input type="checkbox"/>				
18. I am more likely to want sex when using stimulants	<input type="checkbox"/>				
19. When using stimulants I feel more horny or sexually aroused	<input type="checkbox"/>				
20. Sex is better when I've been using stimulants	<input type="checkbox"/>				
21. My judgement can become impaired when using stimulants	<input type="checkbox"/>				
23. I'm more likely to assume the other person is the same HIV status when using stimulants	<input type="checkbox"/>				
25. I make decisions about sex I would not make if not using stimulants	<input type="checkbox"/>				
26. My sexual functioning is enhanced when using stimulants	<input type="checkbox"/>				
27. When using stimulants I am more forward with possible sexual partners	<input type="checkbox"/>				
27. I feel more connected with other people when I use stimulants	<input type="checkbox"/>				
28. I'm more likely to have unprotected sex if I've used stimulants (change all)	<input type="checkbox"/>				

	1	2	3	4	5
29. I'm more likely to make bad decisions when I use stimulants	<input type="checkbox"/>				
30. I'm less aware of what I'm doing when I've been using stimulants	<input type="checkbox"/>				
31. I can become paranoid or suspicious after using stimulants	<input type="checkbox"/>				
32. I'm more likely to let others know I'm attracted to them when I use stimulants	<input type="checkbox"/>				
33. I feel more stimulation and sensations during sex when I'm using stimulants	<input type="checkbox"/>				
34. When I use stimulants my body is more physically sensitive	<input type="checkbox"/>				
35. Stimulants make me more outgoing	<input type="checkbox"/>				
35. My emotions are heightened when using stimulants	<input type="checkbox"/>				
37. I have more adventurous sex when using stimulants	<input type="checkbox"/>				
38. I'm more confident when I've been using stimulants	<input type="checkbox"/>				
39. When I use stimulants I am less choosy about sexual partners	<input type="checkbox"/>				
40. I feel more accepted by others when I use stimulants	<input type="checkbox"/>				
41. I'm more likely to go looking for sex when I've been using stimulants	<input type="checkbox"/>				
42. I'm less likely to discuss my/my partner's HIV status with my partner during sex when I'm using stimulants	<input type="checkbox"/>				
43. I'm more likely to have sex without a condom when using stimulants	<input type="checkbox"/>				
44. When I use stimulants I may think unsafe sex is ok at the time	<input type="checkbox"/>				

**Appendix N: Demographics form (Phase 3)**

(Text included in online version)

**Demographics**

1. How old are you? \_\_\_\_\_
2. How do you identify:  
 gay/homosexual  
 bisexual  
 straight/heterosexual  
 unsure/undecided  
 other (*please specify*) \_\_\_\_\_
3. How much of your free time is spent with gay or homosexual men?  
 none  
 a little  
 some  
 a lot
4. What is your gender?  
 male  
 female  
 transgender M-F  
 transgender F-M  
 other (*please specify*) \_\_\_\_\_
5. What is your relationship status (*please tick*):  
 single  
 married (relationship with a man)  
 married (relationship with a woman)  
 separated  
 divorced  
 other (*please specify*) \_\_\_\_\_
6. What is your employment status (*please tick*):  
 working full-time  
 working part-time  
 unemployed  
 pension/Benefit  
 student  
 retired  
 other (*please specify*) \_\_\_\_\_
7. What is your usual occupation? \_\_\_\_\_
8. Where do you live?  
 urban/metro  
 regional area  
 rural/country area
9. What is your postcode? (optional) \_\_\_\_\_

10. Are you:
- Aboriginal
  - Torres Strait Islander
  - from a Culturally or Linguistically Diverse Background
  - Anglo-Australian
  - other (*please specify*)
11. Please tick all that apply regarding your education history:
- Less than Year 10
  - Finished Year 10
  - Finished Year 12
  - TAFE course/certificate
  - Started University, but did not complete
  - University graduate
  - Post-graduate studies

**Appendix O: Substance use history form (Phase 3)**

(Text for online version)

**Substance Use History**

1. Which of the following substances have you used (*please tick each item for both time periods*):

	<b>In the past 3 months</b>	<b>In your lifetime</b>
a. Marijuana (pot, dope, cannabis)	_____	_____
b. Alcohol	_____	_____
c. Amyl nitrite (“video head cleaner”, “poppers”)	_____	_____
d. Barbituates	_____	_____
e. “Bulbs” (nitrous oxide)	_____	_____
f. Cocaine	_____	_____
g. Crystal methamphetamine (“tina”, “ice”)	_____	_____
h. Heroin (“homebake”)	_____	_____
i. Ecstasy	_____	_____
j. LSD (“acid”)	_____	_____
k. Mushrooms	_____	_____
l. Ketamine (“Special K”, “k”)	_____	_____
m. ”Speed” (“goey”, amphetamines)	_____	_____
n. Tobacco	_____	_____
o. Prescription medications (for recreational use)	_____	_____
p. <i>Examples: Valium, OxyContin, Viagra</i>		
q. Any other drugs ( <i>please specify</i> )	_____	_____

2. Have you ever had alcohol? Yes/No (*please select*)

2a. Have you had alcohol in the past 3 months? Yes/No (*please select*)  
 If Yes, How much alcohol do you usually have per occasion? \_\_\_\_\_ standard drinks (*one standard drink = middy/stubby = beer = small glass of wine = 1 nip spirits*)

2b. Have you had alcohol in the past 30 days? Yes/No (*please select*)  
 If Yes, How many times have you had alcohol in the past 30 days? -  
 \_\_\_\_\_

2c. How much alcohol do you usually have per occasion? \_\_\_\_\_ standard drinks (*one standard drink = middy/stubby = beer = small glass of wine = 1 nip spirits*)

3. Have you ever had marijuana (cannabis, pot, dope)? Yes/No (please select)
- 3a. Have you had marijuana (cannabis, pot, dope) in the past 3 months? Yes/No (please select)  
If Yes, How much marijuana do you usually have per occasion? \_\_\_\_\_  
cones/joints/ounces (please select)
- 3b. Have you had marijuana (cannabis, pot, dope) in the past 30 days? Yes/No (*please select*)  
If Yes, How many times have you used marijuana (cannabis, pot, dope) in the past 30 days? \_\_\_\_\_
- 3c. How much marijuana do you usually have per occasion? \_\_\_\_\_  
cones/joints/ounces (*please select*)
4. Have you ever had amyl (“video head cleaner”, “poppers)? Yes/No (please select)
- 4a. Have you had amyl (“video head cleaner”, “poppers) in the past 3 months? Yes/No (please select)  
How many hits/sniffs/snorts/puffs do you usually have per occasion? \_\_\_\_\_
- 4b. Have you had amyl (“video head cleaner”, “poppers) in the past 30 days? Yes/No (please select)  
If Yes, How many times have you used “poppers” in the past 30 days?  
\_\_\_\_\_
- 4c. How many hits/sniffs/snorts/puffs do you usually have per occasion? \_\_\_\_\_
5. Have you ever had any stimulants (speed, ecstasy, amphetamines, goey, crystal meth, ice, tina)? Yes/No (*please select*)
- 5a. Which of the following have you used in your lifetime/past 3 months/past 30 days: speed, ecstasy, amphetamines, goey, crystal meth, ice, tina (*please select*)[choices will be given this the and the following questions with algorithms to skip redundant items, within the computer program]
- 5b. If Yes (to use in the past 3 months), How much do you usually have (per occasion)? \_\_\_\_\_ grams/tablets/hits/points (of speed, ecstasy, amphetamines, goey, crystal meth, ice)
- 5c. If Yes (to use in the past 30 days), How many times have you used stimulants (speed, ecstasy, amphetamines, goey, crystal meth, ice) in the past 30 days? \_\_\_\_\_
- 5d. How much do you usually have (per occasion)? \_\_\_\_\_  
grams/tablets/hits/points (of speed, ecstasy, amphetamines, goey, crystal meth, ice)
6. Have you used prescription medications (for recreational use) in the past 3 months)  
Yes/NO(*please select*)
- 6a. Which prescription medications have you used (for recreational use)?  
\_\_\_\_\_

**Appendix P: Questionnaire protocol, SEP-MSM (Phase 3)**

(Text from online version)

**Substance Expectancy Questionnaire****A. Stimulants (SEQ-MSM; final version)**

Please select if you have ever used any stimulants (speed, ecstasy, amphetamines, goey, crystal meth, ice) in your lifetime:

\_\_\_\_\_ I have used stimulants

\_\_\_\_\_ I have NEVER used stimulants

*[If “yes”, survey continues to Q40, if “no” computer program skips ahead to next substance type]*

There are 12 statements on this page. Please rate each one based on YOUR beliefs about stimulants (amphetamines, speed, goey, Ecstasy, crystal meth, Tina, ice).

40. PLEASE TAKE THE TIME TO FILL OUT THE ENTIRE PAGE AND CONTINUE TO SCROLL DOWN. You only need to tick the boxes and it shouldn't take too long. Go with your first instinct and try not to think too much about each statement.

40.1	When I use stimulants I may think unsafe sex is okay at the time
40.2	I am less likely to discuss my/my partners HIV status with my partner during sex when I've been using stimulants
40.3	I'm more likely to go looking for sex when I've been using stimulants
40.4	I have more adventurous sex when using stimulants
40.5	I think a lot more about sex when using stimulants
40.6	Stimulants make me more outgoing
40.7	I feel more stimulation and sensations during sex when I'm using stimulants
40.8	Using stimulants makes sex last longer
40.9	I am less likely to ask for/discuss condoms if I've been using stimulants
40.10	I can become paranoid or suspicious after using stimulants
40.11	Sex is better when I've been using stimulants
40.12	I'm more likely to assume the other person is the same HIV status when using stimulants

**B. Amyl nitrite (AEQ-MSM; final version)**

Please select if you have ever used amyl (“video head cleaner”, “poppers”) in your lifetime:

\_\_\_\_\_ I have used amyl

\_\_\_\_\_ I have NEVER used amyl

*[If “yes”, survey continues to Q40, if “no” computer program skips ahead to next substance type]*

42. There are 17 statements on this page. Rate each one based on YOUR beliefs about amyl (“video head cleaner”, “poppers”). PLEASE TAKE THE TIME TO FILL OUT THE ENTIRE PAGE AND CONTINUE TO SCROLL DOWN. You only need to tick the boxes and it shouldn't take too long. Go with your first instinct and try not to think too much about each statement.

42.1	I'm more likely to make bad decisions when I use amyl
42.2	I'm less likely to discuss/my partner's HIV status with my partner during sex when using amyl
42.3	I am less likely to ask for/discuss condoms if I've been using amyl
42.4	Interacting with others is more difficult when using amyl
42.5	I have stronger sexual desires when using amyl
42.6	When I use amyl my body is more physically sensitive
42.7	I have more adventurous sex when using amyl
42.8	I let sexual partners make decisions for me when using amyl
42.9	My sexual performance is enhanced when using amyl
42.10	I feel disoriented when using amyl
42.11	My mood is better when using amyl
42.12	Anal sex is less painful when using amyl
42.13	Sex is better when using amyl
42.14	I take risks I wouldn't normally take when using amyl
42.15	I'm on a big high when using amyl
42.16	I feel more accepted by others when I use amyl
42.17	When using amyl I feel more horny or sexually aroused

**C. Alcohol (DEQ-MSM; final version)**

Please select if you have ever used alcohol in your lifetime:

\_\_\_\_\_ I have used alcohol

\_\_\_\_\_ I have NEVER used alcohol

*[If “yes”, survey continues to Q40, if “no” computer program skips ahead to next substance type)]*

- 46 There are 10 statements on this page. Rate each one based on YOUR beliefs about alcohol. PLEASE TAKE THE TIME TO FILL OUT THE ENTIRE PAGE AND CONTINUE TO SCROLL DOWN. You only need to tick the boxes and it shouldn't take too long. Go with your first instinct and try not to think too much about each statement.

46.1	I'm less able to ask for/discuss condoms during sex when drinking
46.2	When I drink my body is more physically sensitive
46.3	I become less rational when I'm drinking
46.4	When I'm drinking I'm more forward with possible sexual partners
46.5	Drinking makes it difficult for me to concentrate
46.6	Drinking makes my sexual performance better
46.7	Sex is better when I've been drinking
46.8	I feel more stimulation during sex when I'm drinking
46.9	I feel more connected with other people when I drink
46.10	My mood is better when I've been drinking

**D. Cannabis (CEQ-MSM; final version)**

Please select if you have ever used cannabis (marijuana, pot, dope) in your lifetime:

\_\_\_\_\_ I have used cannabis

\_\_\_\_\_ I have NEVER used cannabis

*[If "yes", survey continues to Q40, if "no" computer program skips ahead to next section]*

44. There are 28 statements on this page. Rate each one based on YOUR beliefs about cannabis (marijuana, pot, dope). PLEASE TAKE THE TIME TO FILL OUT THE ENTIRE PAGE AND CONTINUE TO SCROLL DOWN. You only need to tick the boxes and it shouldn't take too long. Go with your first instinct and try not to think too much about each statement.

44.1	Using cannabis makes it difficult for me to concentrate
44.2	I'm less likely to discuss my/my partner's HIV status with my partner during sex when using cannabis
44.3	Using cannabis makes me feel numb
44.4	My emotions are heightened when using cannabis
44.5	I'm more likely to have sex without a condom when I've been using cannabis
44.6	I don't think clearly when using cannabis
44.7	I make decisions about sex I would not make if not using cannabis
44.8	Sex is better when I've been using cannabis
44.9	Using cannabis helps me to escape from my problems
44.10	When I use cannabis I feel more loving
44.11	Using cannabis makes sex last longer
44.12	I have more adventurous sex when using cannabis
44.13	I feel more connected with other people when I use cannabis
44.14	Sex tends to be more loving when using cannabis
44.15	When I use cannabis I may think unsafe sex is okay at the time
44.16	I'm more likely to let others know I'm attracted to them when I use cannabis
44.17	I feel more accepted by others when I use cannabis
44.18	I'm more likely to make bad decisions when I'm using cannabis
44.19	It's easier to express my sexual needs or desires when I use cannabis
44.20	When using cannabis I feel more horny or sexually aroused
44.21	I feel more carefree when using cannabis
44.22	I am less likely to ask for/discuss condoms if I've had cannabis
44.23	I feel more relaxed during sex when I've used cannabis

44.24	When I use cannabis I am less choosy about sexual partners
44.25	My sexual performance is enhanced when using cannabis
44.26	I let sexual partners make decisions for me when using cannabis
44.27	When I use cannabis my body is more physically sensitive
44.28	I think about sex more often when I'm using cannabis

**Appendix Q: Questionnaire protocol, sexual behaviour (Phase 3)**

(Text for online version)

**Sexual Behaviour**

1. Have you ever had unprotected (without a condom) anal sex in your lifetime?  
Yes/no (*please select*)
  
2. Have you had any unprotected (without a condom) anal sex in the past 3 months?  
Yes/no (*please select*)
  
3. Have you used alcohol or other drugs before or during sex in the past 3 months?  
Yes/no (*please select*)
  - a. If yes: Have you had any unprotected (without a condom) anal sex after using alcohol or any other drugs in the past 3 months? Yes/no (*please select*)
  
4. Have you had any anal sex in the past 2 weeks? Yes/no (*please select*)
  - a. If yes: Thinking about your last sexual encounter involving anal sex in the past 2 weeks...
    - did you have unprotected anal sex? Yes/no (*please select*)
    - did you use alcohol or any other drugs before or during sex? Yes/no (*please select*)

**Appendix R: Questionnaire protocol, TCI-125 NS (Phase 3)**

(Text for online version)

**TCI-125 (NS)**

In this questionnaire you will find statements people might use to describe their attitudes, opinions, interests, and other personal feelings. Each statement can be answered TRUE or FALSE. Please read each statement and decide which choice best describes you. Try to describe the way you USUALLY or generally act and feel, not just how you are feeling right now.

Read each statement carefully, but don't spend too much time deciding on the answer. Please answer every statement, even if you are not completely sure of the answer. Remember there are no right or wrong answers – just describe your own personal opinions and feelings.

1. I often try new things just for fun or thrills, even if most people think it is a waste of time.
2. I often do things based on how I feel at the moment without thinking about how they were done in the past.
3. I am much more reserved and controlled than most people.
4. I often spend money until I run out of cash or get into debt from using too much credit.
5. I like to think about things for a long time before I make a decision.
6. I like it when people can do whatever they want without strict rules and regulations.
7. I usually think about all the facts in detail before I make a decision.
8. I am usually able to get other people to believe me, even when I know that what I am saying is exaggerated or untrue.
9. I have a reputation as someone who is very practical and does not act on emotion.
10. I prefer spending money rather than saving it.
11. If I am embarrassed or humiliated, I get over it very quickly.
12. I usually demand very good practical reasons before I am willing to change my old ways of doing things.
13. I often follow my instincts, hunches, or intuition without thinking through all the details.
14. I am better at saving money than most people.
15. Even when most people feel it is not important, I often insist on things being done in a strict and orderly way.
16. I often break rules and regulations when I think I can get away with it.
17. I like to make quick decisions so I can get on with what has to be done.
18. I enjoy saving money more than spending it on entertainment or thrills.
19. When nothing new is happening, I usually start looking for something that is thrilling or exciting.