

On Feeling Torn About One's Sexuality: The Effects of Explicit-Implicit Sexual Orientation Ambivalence

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Summary

This research addressed the consequences of explicit-implicit sexual orientation (SO) ambivalence in samples of straight- and gay-identified individuals. Study 1 revealed worse psychological health among straight-identified individuals with greater SO ambivalence. Further, greater SO ambivalence was linked with negative self-identity, an effect moderated by the direction of ambivalence. Given these negative psychological effects, the research aimed to investigate how individuals resolved their ambivalence via the processing of relevant information. In Studies 1 and 2 straight-identified individuals with greater SO ambivalence took longer to respond to direct questions on sexuality, an effect moderated by the direction of ambivalence. In an additional sample of straight-identified individuals, Study 3 confirmed the robustness of these effects by replicating the same pattern of findings using an established measure of systematic processing, thought elaboration. Study 3 also demonstrated the impact of anti-gay attitudes on the processing of information relevant to SO.

In samples of gay-identified individuals, Studies 4 and 5 demonstrated that individual differences in SO ambivalence also impacted the processing of direct questions on sexuality, but in ways that differed to straight-identified individuals. Individual differences in SO ambivalence also related to well-being, stigma, and out-group discrimination. Additionally, for gay-identified individuals, the research considered implications of discrepant explicit-implicit evaluations towards one's SO. Discrepant explicit-implicit evaluations of SO related to discrepant self-esteem and smaller actual-ideal discrepancies. Further, a number of negative outcomes were observed when gay-identified individuals reported being positive towards their SO whilst being somewhat more negative towards it on the implicit measure.

Study 6 examined wider implications of SO ambivalence in a further sample of straight-identified individuals. The findings showed that information relevant to SO ambivalence is communicated non-verbally, and that the experience of SO ambivalence moderates the ability to detect such information.

Table of Contents

Summary	i
Declaration	iii
Table of contents	iv
Table of figures	x
Table of tables	xii
Acknowledgments	xiv
Resulting publication	xvi
Chapter One	1
<i>Overview of chapter</i>	1
<i>Attitudinal ambivalence and information processing</i>	2
Explicit ambivalence and information processing	2
Explicit-implicit ambivalence	7
Explicit-implicit ambivalence and information processing	11
<i>Sexual orientation, concealment, and sexual orientation ambivalence</i>	15
Explicit-implicit sexual orientation ambivalence	18
<i>Overview of the thesis</i>	22
Chapter Two	23
<i>Overview of chapter</i>	23
<i>Study 1, Section 1 – SO ambivalence, well-being and self-identity</i>	24
<i>Introduction</i>	24
The agony of ambivalence	24
The hypothesised agony of explicit-implicit SO ambivalence	25
Summary and research objectives	28
<i>Method</i>	30
Participants	30
Materials	30
Procedure	42
<i>Results</i>	43
Descriptive statistics	43
Feeling torn: consequences for psychological well-being	46
<i>Discussion</i>	49
Feeling torn: consequences for psychological well-being	49
Feeling torn: consequences for self-identity	50
A brief summary of the findings	52

<i>Study 1, Section 2 – SO ambivalence and information processing</i>	53
<i>Introduction</i>	53
The measurement of systematic information processing	55
Summary	57
<i>Method</i>	57
<i>Results</i>	58
Feeling torn: consequences for information processing	58
<i>Discussion</i>	59
<i>General summary</i>	61
Chapter Three	63
<i>Overview of chapter</i>	63
<i>Introduction</i>	63
<i>Study 2</i>	65
<i>Method</i>	65
Participants	65
Materials	66
Procedure	66
<i>Results</i>	66
Descriptive statistics	66
Feeling torn: consequences for information processing	67
Discussion	68
<i>Study 3</i>	71
An alternative measure of processing – thought listing	71
The role of anti-gay attitudes	75
<i>Method</i>	76
Participants	76
Materials	76
Procedure	79
<i>Results</i>	79
Descriptive statistics	79
Feeling torn: consequences for processing (response time)	80
Feeling torn: consequences for processing (elaboration)	81
Feeling torn: consequences for post-message attitude	84
The role of anti-gay attitudes	85
<i>Discussion</i>	87
SO ambivalence and systematic information processing	87

The role of anti-gay attitudes	88
Chapter Four	90
<i>Overview of chapter</i>	90
<i>Introduction</i>	90
Sexual orientation and well-being in gay-identified individuals	91
Study 4	96
<i>Method</i>	97
Participants	97
Materials	97
Procedure	101
<i>Results</i>	101
Descriptive statistics	102
The effect of explicit-implicit SO ambivalence	105
Information processing	105
Psychological well-being	106
Evaluation of one's SO	110
<i>Discussion</i>	112
On feeling torn: The effects of explicit-implicit SO ambivalence in gay-identified individuals	112
Information processing	112
Psychological well-being	114
The effect of discrepant explicitly and implicitly measured evaluations of one's SO	115
Chapter Five	117
<i>Overview of chapter</i>	117
<i>Introduction</i>	118
Study 5	124
<i>Method</i>	124
Participants	124
Materials	124
Procedure	130
<i>Results</i>	130
Descriptive statistics	131
Consequences of explicit-implicit SO ambivalence	136
Information processing	136
Measures of self-identity	136

Evaluation of one's SO	137
Well-being	137
Discrimination on the basis of SO	137
Correlates of discrepant self-esteem measures	140
Exploratory measures	141
Summary of key findings	145
The effect of discrepant explicitly and implicitly measured evaluations of one's SO	146
Correlates of discrepant self-esteem measures	146
Well-being	148
Discrimination on the basis of SO	150
Exploratory measures	152
Summary of key findings	157
<i>Discussion</i>	157
On feeling torn: The effects of explicit-implicit SO ambivalence in gay-identified individuals	158
Information processing	158
Minority stress	158
Outgroup discrimination	160
The effect of discrepant explicitly and implicitly measured evaluations of one's SO	165
Chapter Six	166
<i>Overview of chapter</i>	166
<i>Introduction</i>	167
Non-verbal communication of SO ambivalence	168
Study 6	173
<i>Method</i>	173
Participants	173
Materials	173
Procedure	174
<i>Results</i>	175
Sensitivity to targets' SO	175
Sensitivity to targets' ambivalence	177
Summary of key findings	178
Feeling torn and seeing torn: The moderating influence of participants' SO ambivalence on social perception judgements	179

Summary of key findings	186
<i>Discussion</i>	187
General perceptibility of targets' SO ambivalence	187
The moderating influence of SO ambivalence on the perception of relevant non-verbal information	188
Limitations and concluding remarks	190
Chapter Seven, General Discussion	192
<i>Overview of chapter</i>	192
<i>Implications of explicit-implicit SO ambivalence in samples of straight-identified individuals</i>	192
Well-being and self-identity	192
Information processing	195
Theoretical explanation	197
Limitations	199
The role of anti-gay attitudes	199
Limitations	201
<i>Findings specific to gay-identified individuals</i>	201
The effect of discrepant explicitly and implicitly measured evaluations of one's SO	201
Theoretical explanation	203
Summary	205
Implications of explicit-implicit SO ambivalence	206
Information processing	206
Theoretical explanation	206
Limitations	207
Well-being	208
Outgroup discrimination	209
Additional limitations	210
<i>On the wider effects of explicit-implicit SO ambivalence: Feeling torn and seeing torn</i>	210
Limitations	213
<i>Wider impacts of the research</i>	214
When low equals high: The importance of awareness and stigma	214
Ambivalence and the processing of relevant non-verbal information	215
<i>Conclusion</i>	216

References	218
Appendices	237
Appendix 1: Explicit measure of SO	237
Appendix 2: Implicit measure of SO	238
Appendix 3: Life satisfaction measure	242
Appendix 4: Happiness measure	243
Appendix 5: Reappraisal and suppression	244
Appendix 6: Rumination measure	245
Appendix 7: Self-identity measures	246
Appendix 8: Manipulation of topic relevance	247
Appendix 9: Anti-gay attitude measure	249
Appendix 10: Evaluation of one's SO measures	250
Appendix 11: Positive and negative affect scales	254
Appendix 12: Measures of discrimination on the basis of SO	255
Appendix 13: Multidimensional perfectionism scale	257
Appendix 14: Actual-ideal discrepancy measure	259
Appendix 15: Outgroup discrimination measure	261
Appendix 16: Mindful attention awareness scale	264
Appendix 17: Big-Five personality constructs	265

Table of Figures

Figure 2.1: Blocks 1 through 5 on the sexual orientation IAT.	37
Figure 2.2: Study 1, the impact of the amount and the direction of SO ambivalence on SO identity.	48
Figure 2.3: Study 1; the impact of the amount and the direction of SO ambivalence on information processing (response time measure).	59
Figure 3.1: Study 2, the impact of the amount and the direction of SO ambivalence on information processing (response time measure).	68
Figure 3.2: Study 3, the impact of the amount and the direction of SO ambivalence on information processing (response time measure).	81
Figure 3.3: Study 3, the impact of the amount and the direction of SO ambivalence on elaboration after reading SO-relevant information.	83
Figure 3.4: Study 3, The impact of anti-gay attitude and the amount of SO ambivalence on the response time measure of processing among those who report being <i>more straight</i> on the explicit measure of SO relative to their response on the implicit measure.	87
Figure 4.1: Study 4, the impact of the amount and the direction of SO ambivalence on information processing (response time measure).	106
Figure 4.2: Study 4, the impact of the amount and the direction of SO ambivalence on explicitly measured self-esteem.	107
Figure 5.1: Study 5, the impact of the amount and the direction of SO ambivalence on non-personal anti-gay discrimination.	138
Figure 5.2: Study 5, the impact of the amount and the direction of SO ambivalence on anti-gay discrimination in the past 12-months.	139
Figure 5.3: Study 5, the impact of the amount and the direction of SO ambivalence on Extraversion.	141
Figure 5.4: Study 5, the impact of the amount and the direction of SO ambivalence on Agreeableness.	142
Figure 5.5: Study 5, the impact of discrepant explicitly and implicitly measured evaluations towards one's SO on perfectionism.	147
Figure 5.6: Study 5, the impact of discrepant explicitly and implicitly measured evaluations towards one's SO on explicitly measured self-esteem.	149
Figure 5.7: Study 5, the impact of discrepant explicitly and implicitly measured evaluations towards one's SO on PANAS.	150

Figure 5.8: Study 5, the impact of discrepant explicitly and implicitly measured evaluations towards one's SO on personal anti-gay discrimination.	152
Figure 5.9: Study 5, the impact of discrepant explicitly and implicitly measured evaluations towards one's SO on MAAS.	153
Figure 5.10: Study 5, the impact of discrepant explicitly and implicitly measured evaluations towards one's SO on Emotional Stability.	155
Figure 6.1: Handwriting sample example.	174
Figure 6.2: The moderating influence of participants' SO ambivalence on the association between judgements of SO and targets' direction of ambivalence.	183
Figure 6.3: The moderating influence of participants' SO ambivalence on the association between judgements of torn and targets' direction of ambivalence.	184

Table of Tables

Table 1.1: Conceptualisation of individual differences in the amount and the direction of explicit-implicit ambivalence.	12
Table 2.1: The amount and the direction of explicit-implicit SO ambivalence.	39
Table 2.2: Study 1, summary of correlations, means, and standard deviations.	45
Table 2.3: Study 1, summary of standardised regression coefficients.	49
Table 3.1: Study 3, summary of standardised regression coefficients.	83
Table 4.1: The amount and the direction of ambivalence between response on explicit and implicit measures of evaluation of one's SO.	101
Table 4.2: Study 4, summary of correlations, means, and standard deviations	104
Table 4.3: Study 4, summary of standardised regression coefficients.	109
Table 4.4: Study 4, summary of standardised regression coefficients.	111
Table 5.1: Study 5, summary of correlations, means, and standard deviations.	132
Table 5.2: Study 5, summary of correlations, means, and standard deviations.	132
Table 5.3: Study 5, summary of correlations, means, and standard deviations.	133
Table 5.4: Study 5, summary of correlations, means, and standard deviations.	133
Table 5.5: Study 5, summary of correlations, means, and standard deviations.	134
Table 5.6: Study 5, summary of correlations, means, and standard deviations.	135
Table 5.7: Study 5, summary of standardised regression coefficients.	144
Table 5.8: Study 5, summary of standardised regression coefficients.	156
Table 6.1: Fisher's Z scores detailing the association between participants' social perception judgements and targets' SO.	176
Table 6.2: Fisher's Z scores detailing the association between participants' social perception judgements and targets' SO ambivalence.	178

Table 6.3: Study 6, summary of standardised regression coefficients.	181
Table 6.4: Study 6, summary of standardised regression coefficients.	185

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CHAPTER ONE:

AMBIVALENCE AND SEXUAL ORIENTATION

Overview of Chapter

The work described in this thesis is concerned with the consequences of explicit-implicit Sexual Orientation (SO) ambivalence; specifically, its effects on information processing and psychological well-being. This chapter provides a review of the most relevant background literature, integrating contemporary work on attitudinal ambivalence and SO. The chapter starts by considering what is meant by attitudinal ambivalence - how it has been operationalised and its effects on information processing. In discussing this work, we will see that most research on ambivalence has used explicit measures to quantify ambivalence. After this discussion, attention turns to explicit-implicit ambivalence. Within this section of the chapter, implicit measures of attitude are defined prior to presenting evidence that highlights their importance. Then, the concept of explicit-implicit attitudinal ambivalence is described, followed by a discussion of evidence describing its consequences. The section of the chapter highlights research documenting the link between explicit-implicit ambivalence and the processing of ambivalence-relevant information.

After the discussion of ambivalence, contemporary definitions of SO are explored, prior to a review on the concealment of SO and its associated effects in both sexual minorities and straight individuals. Parallels are then drawn between the effects of concealing SO and the experience of ambivalence. The chapter concludes by providing a rationale for the thesis and states the importance for research that investigates the consequences of explicit-implicit SO ambivalence for information processing and well-being.

Attitudinal Ambivalence and Information Processing

Explicit Ambivalence and Information Processing

The feeling of ambivalence is an everyday occurrence. Take for instance a slice of chocolate cake. The cake may first bring to mind many positive attributes; namely, the indescribable taste, the chocolate-fix and the accompanying sugar rush. Equally, the same slice of cake may inflict negative attributes. In particular, the nutritional information might remind you that a moderate paced walk of around two hours would be necessary to burn the cake's calories. In scenarios like these, an individual is likely to feel *torn* between competing positive and negative responses, affecting their ability to make an informed choice. This situation is known as attitudinal ambivalence (DeMarree, Wheeler, Briñol, & Petty, 2014; Maio & Haddock, 2015; van Harreveld, van der Pligt, & de Liver, 2009b).

Much research is concerned with self-reported ambivalence, otherwise known as *explicit* attitudinal ambivalence. In this line of work, explicit ambivalence has been operationalised in different ways (see e.g., Newby-Clark, McGregor, & Zanna, 2002). For example, *potential ambivalence* (also referred to as objective ambivalence) refers to the conflict that exists between discrepant evaluations of an attitude object. This involves the self-reported measurement of both positive and negative evaluations; when participants simultaneously exhibit extremely positive *and* negative attitudes, ambivalence occurs (see Kaplan, 1972; Priester & Petty, 1996; Thompson, Zanna, & Griffin, 1995). In addition, *felt ambivalence* (also referred to as subjective ambivalence) refers to individuals' subjective reports of

conflict associated with holding mixed evaluations of an object (Priester & Petty, 1996).¹

Research has found the experience of ambivalence to be associated with negative outcomes. For instance, in a study of racial ambivalence, Monteith (1996) measured White participants' attitudes towards African Americans. The research found heightened guilt and psychological discomfort (e.g., unease, anxiety) among racially ambivalent individuals (i.e., those who reported extremely pro- and anti-Black attitudes). However, the same outcomes were not found among those who had non-ambivalent attitudes towards African Americans. In other research, van Harreveld, Rutjens, Rotteveel, Nordgren, and van der Pligt (2009b) asked participants to read a message on the introduction of an employment law that contained either univalent (negative) or ambivalent (positive and negative) information. For ambivalence-induced participants, higher levels of skin conductance were found when participants were instructed to make a choice on the issue. As such, this study demonstrated an association between the experience of ambivalence and *physiological arousal*, implying an *aversive* psychological state (particularly when ambivalent individuals are faced with making a choice; for a general review on the agony of ambivalence see van Harreveld et al., 2009b). On

¹ Ambivalence has also been conceptualised in terms of *intracomponent ambivalence* and *intercomponent ambivalence*. Intracomponent ambivalence is discrepancy that exists within attitudinal components e.g., experiencing positive and negative feelings (affect) towards an object, or experiencing positive and negative beliefs (cognitions). Intercomponent ambivalence is discrepancy between different components of attitudes e.g., experiencing positive feelings towards the object but having negative beliefs, or vice-versa (e.g., Lavine, Thomsen, Zanna, & Borgida (1998); Maio, Esses, & Bell, 2000; Maio & Haddock, 2015).

account of the negative feelings associated with ambivalence, it is understandable that individuals will be motivated to reduce such feelings.

Ambivalence can be addressed in a number of ways (see van Harreveld et al., 2009b for an overview). Owing to the aversive nature of ambivalence, one possibility is that individuals may *avoid* commitment to making a particular decision. For instance, in a meta-analysis, Steel (2007) found that when individuals completed tasks perceived to be unpleasant and aversive, they were more likely to engage in *procrastination*. As such, it is possible that when ambivalent individuals are faced with the difficult decision of committing to a univalent position, they might employ 'delay tactics,' allowing them to avoid making a decision, and hence the resolution of ambivalence. This strategy has been found to be used by individuals to reduce the intensity of emotions as a result of experiencing ambivalence (e.g., Luce, Bettman, & Payne, 1997).

As an alternative, a clear way to resolve ambivalence would be to change one's attitude. To do this, ambivalent individuals might engage in systematic processing of relevant information, in order to obtain evidence to strengthen the case for a univalent position on the attitude object in question. Evidence for this has been demonstrated in research investigating the effects of explicit ambivalence on information processing.

For example, at a time of increased media coverage in Canada on the immigration of individuals from Hong Kong, Maio, Bell, and Esses (1996) measured the valence of participants' attitudes and feelings towards Asian individuals. Subsequently, participants read arguments that either contained strong arguments for the immigration of individuals from Hong Kong (e.g., there is a high probability that citizens from Hong Kong would have positive emotions, personality traits, and

values), or weak arguments (e.g., there is a *low* probability that citizens from Hong Kong would have positive emotions, personality traits, and values). After reading the arguments, the depth of information processing was measured by inviting participants to report their thoughts (elicited thoughts is a well-established measure of the depth of processing; e.g., Greenwald, 1968; Petty & Cacioppo, 1986; see Chapter 3). Furthermore, post-message attitudes were assessed.

The study found that when participants had higher levels of ambivalence towards Asian individuals, more univalent (positive) attitudes towards the immigration of individuals from Hong Kong were found among those who had read strong arguments compared to those who had read weak arguments, implying an *argument quality effect*. Importantly, this effect was mediated by the favourability of participants' thoughts, showing the importance of information processing for the reduction of ambivalence. When considering individuals who had non-ambivalent attitudes towards Asians, message strength did not influence attitudes toward the immigration of individuals from Hong Kong; instead, agreement and thought favourability were predicted by initially measured attitudes. As such, Maio et al. (1996) provided direct evidence that ambivalence can be reduced via systematic information processing. In particular, the argument quality effect showed that highly ambivalent individuals allocated more cognitive resources to, and engaged in greater scrutiny of, the attitude-relevant information (for information on the Elaboration Likelihood Model see Petty & Cacioppo, 1984, 1986).

The phenomenon of systematic processing among ambivalent individuals has been widely replicated. Jonas, Diehl, and Brömer (1997) measured participants' attitudes towards a shampoo and then presented either attitudinally

consistent or inconsistent information. Subsequently, the depth of information processing was measured by inviting participants to report their thoughts about the shampoo. For participants manipulated to experience ambivalence (i.e., those who read attitudinally-inconsistent information), more thoughts on specific properties of the shampoo were reported. In other words, individuals with ambivalence thought in more depth about specific attitudinal-attributes, showing that ambivalence promotes the systematic processing of relevant information.

More recently, Clark, Wegener, and Fabrigar (2008; Study 2) found that the phenomenon of enhanced systematic processing in ambivalent individuals was greater when information is perceived as likely to reduce the ambivalence. In this research, individuals with ambivalent attitudes towards junk food taxation read either strong or weak arguments for the introduction of a junk food tax. When the persuasive message was perceived to be in line with pre-message attitudes (the information is *pro-attitudinal*), more positive univalent attitudes were found after ambivalent participants had read strong arguments. However, the degree to which strong arguments produced positive univalent attitudes was dependent on whether ambivalent individuals believed that the message was able to reduce their ambivalence. When ambivalent individuals felt that information in the message allowed them to address their ambivalence, systematic processing of pro-attitudinal information resulted in more univalent attitudes (and hence ambivalence reduction). As such, the belief that ambivalence-relevant information has the ability to reduce the conflict being experienced may explain the impact of systematic processing.

In summary, explicit ambivalence is the simultaneous experience of both positive and negative feelings towards an attitude object, an experience that has

been associated with negative psychological outcomes (e.g., Monteith, 1996; van Harreveld et al., 2009a, 2009b). Research has focused on how individuals go about addressing ambivalence. Much of this work has focused on the information processing consequences of explicit ambivalence, and has found that ambivalent individuals systematically process relevant information (e.g., Jonas et al., 1997; Maio et al., 1996). The systematic processing of relevant information attenuates ambivalence by providing ambivalent individuals the opportunity to form clear-cut, univalent attitudes (Luce et al., 1997; Maio et al., 1996; van Harreveld et al., 2009b). It is likely that the phenomenon of systematic processing is explained by the belief that relevant information can help to reduce the ambivalence being experienced (Clark et al., 2008).

Explicit-Implicit Ambivalence

Within the attitudes literature, perhaps the most substantial recent advance is the development of implicit measures of attitude. These measures were developed in response to growing recognition that, upon encountering objects, our perceptions can be influenced by external factors (see Fazio, 2001; Fazio & Olson, 2003; Greenwald & Banaji, 1995). For example, motivational factors, such as not wanting to appear prejudiced, can infiltrate responses on explicit measures of attitude (e.g., Gawronski, Hofmann, & Wilbur, 2005). Unlike explicit measures that directly ask about the attitude object in question, implicit measures, such as the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) typically assess attitudes without asking participants to explicitly consider their attitude toward the object. In the IAT, a participant is presented with two categories at the top of a computer screen. On the left, they might see the labels “Cake OR positive,” and on the right they might see the labels “Fruit OR negative;” each label

corresponds to a *single* button press. In the centre of the screen they would be presented with stimuli from four different classes - pictures of cake, pictures of fruit, negative words, and positive words. In core blocks of the measure, the task would involve categorising each stimulus as *quickly* and as *accurately* as possible using the appropriate button press. In the task described, if an individual's response time is relatively high (i.e., the categorisation is slow and difficult), it can be said that the task conflicts with the automatically activated attitude. As such, they do not see cake as positive and they do not see fruit as negative.²

The importance of implicit measures are clear in light of research showing that they can reveal remarkably different evaluations when compared to explicit measures that assess *the same* attitude object (for a general overview see Nosek, 2005). To give an example, research has highlighted that while individuals may not be prejudiced on explicit measures of racial attitudes, such attitudes might be found on implicit measures. In one study, Dovidio, Kawakami, Johnson, and Howard (1997) assessed White participants' racial attitudes towards Black individuals using a traditional explicit measure (the Modern Racism Scale), finding low levels of racial prejudice. However, when racial attitudes were assessed using an evaluative priming procedure (an implicit measure of attitude; see Fazio, Jackson, Dunton, & Williams, 1995), participants responded faster to positive words following a White prime (a picture of a White person's face) when compared to a Black prime (a picture of a Black person's face), implying a positive automatic evaluation of White faces (but not Black faces). Conversely, participants

² Responses on this block of trials would be compared to another block where the categorisations are swapped, i.e., Fruit or Positive and Cake or Negative. Providing that an individual has relatively more positive feelings towards fruit than cake, categorisations on this latter block of trials should be relatively quicker than that described above in the main text.

were found to respond faster to negative words following a Black prime relative to a White prime, implying a negative automatic evaluation of Black faces (but not White faces). In a similar vein, Dovidio, Kawakami, and Gaertner (2002) found that explicit and implicit measures of prejudice (of Whites participants towards African Americans) had differential implications for interracial interactions. In particular, an explicit measure of prejudice was found to predict only *deliberative* interracial interactions, such as verbal friendliness. However, an implicit measure of prejudice was found to predict spontaneous but not deliberative racial interactions.³

On the basis of this type of research, it is clear that responses on explicit and implicit measures designed to assess the same attitude object can diverge. This not only highlights the importance of including both kinds of measures, of greater relevance to this thesis, it also helps illustrate the concept of *explicit-implicit* attitudinal ambivalence. Explicit-implicit ambivalence is said to occur when a discrepancy exists between responses on explicit and implicit measures of attitudes for the same attitude object (Briñol, Petty, & Wheeler, 2006). As with explicit attitudinal ambivalence, research has shown there to be negative psychological consequences associated with explicit-implicit ambivalence. For example, Creemers, Scholte, Engels, Prinstein, and Weirs (2012) measured participants' explicit and implicit self-evaluations (self-esteem), and found a positive association between the amount of explicit-implicit discrepancy and levels of self-reported depression, suicidal ideation, and loneliness. Similarly, discrepant explicit-implicit self-esteem has also been found to result in higher levels of self-

³ As an aside, this research example also demonstrates that implicit measures of attitude predict different kinds of behaviour, namely, spontaneous/automatic behaviour. The importance of implicit measures of attitude is further shown by other research showing that the measures often predict behaviour better than explicit measures of attitude (e.g., voting behaviour; Arcuri, Castelli, Galdi, Zogmaister & Amadori, 2008).

doubt and impaired physical health (Briñol et al., 2006; Schröder-Abé, Rudolph, & Schütz, 2007).

What might underlie these effects? Research by Rydell and colleagues has highlighted that explicit-implicit ambivalence can produce an internal state of discomfort that is then used by individuals to interpret their well-being. In one study, Rydell, McConnell, and Mackie (2008; Study 1) created artificial implicit attitudes by presenting participants with a number of trials in which Bob, a fictitious character, was preceded by a subliminal prime that was either positive *or* negative in valence. Subsequently, artificial explicit attitudes were created by describing Bob as having performed a behaviour that either converged or conflicted with the subliminal prime. When there was evaluative conflict between the subliminal prime and the explicit attitude (i.e., induced explicit-implicit ambivalence), higher levels of dissonance were reported. In addition, Rydell and Durso (2012), after using the same paradigm to artificially create conflicting explicit and implicit attitudes, asked participants to complete a number of measures of current well-being. Mediation analyses revealed that the negative arousal produced by explicit-implicit ambivalence was used by individuals to interpret their current well-being. Taken together, these findings imply that when individuals experience explicit-implicit ambivalence, they also experience feelings of *negative arousal* (e.g., a greater discomfort and unease) that are reminiscent of those associated with cognitive dissonance (e.g., Festinger, 1957).

In summary, recent research has utilised explicit and implicit measures of attitude. Implicit measures of attitude are often response time tasks that indirectly assess evaluations of objects. The importance of including such measures is clear on account of research showing that explicit and implicit measures designed to

assess the same attitude object can diverge and predict different outcomes (Dovidio et al., 1997, 2002; Nosek, 2005). Importantly, such research was some of the first to demonstrate the phenomenon of explicit-implicit attitudinal ambivalence. This occurs when a discrepancy exists between responses on explicit and implicit measures of attitude. Similar to explicit ambivalence, explicit-implicit ambivalence relates to negative psychological outcomes (Briñol et al., 2006; Creemers et al., 2012; Schröder-Abé et al., 2007). This is believed to be a result of explicit-implicit ambivalence producing an internal state of discomfort then used by individuals to interpret their well-being (Rydell & Durso, 2012; Rydell et al., 2008).

Explicit-Implicit Ambivalence and Information Processing

On the basis of the effects associated with explicit-implicit attitudinal ambivalence, it is understandable that individuals are motivated to resolve the ambivalence. As with explicit attitudinal ambivalence, research has started to address the consequences of explicit-implicit ambivalence for information processing. Analogous to research on explicit ambivalence, explicit-implicit ambivalence has been found to result in the systematic processing of ambivalence-relevant information.

Across four studies, Briñol et al. (2006) found compelling evidence that greater amounts of explicit-implicit discrepancy resulted in more positive attitudes after reading ambivalence-relevant information that contained strong arguments as opposed to weak arguments. In this research, explicit-implicit ambivalence was investigated by computing two distinct ‘discrepancy variables,’ each with two levels (see Table 1.1). First, the *amount* of explicit-implicit discrepancy was calculated by computing the absolute difference between participants’

standardised scores on the explicit and implicit measures. This was dichotomised into two groups, consisting of those with either a high amount of explicit-implicit conflict or a low amount of explicit-implicit conflict. Second, the *direction* of the explicit-implicit discrepancy was assessed by separating individuals into two groups based on the valence of the non-absolute difference. This resulted with individuals being categorised as either those who had more positive attitudes on the explicit measure relative to the implicit measure (a *positive difference*, i.e., Explicit score > Implicit score), or those who had less positive attitudes on the explicit measure relative to the implicit measure (a *negative difference*, i.e., Explicit score < Implicit score).

Table 1.1. Conceptualisation of individual differences in the amount and the direction of explicit-implicit ambivalence (replace item in bracket with applicable attitude object).

The direction of ambivalence	The amount of ambivalence	
	<i>High</i>	<i>Low</i>
Explicit score > implicit score	More (positive towards cake than fruit) on the explicit measure than the implicit measure to a large degree.	More (positive towards cake than fruit) on the explicit measure than the implicit measure to a small degree.
Explicit score < Implicit score	Less (positive towards cake than fruit) on the explicit measure than the implicit measure to a large degree.	Less (positive towards cake than fruit) on the explicit measure than the implicit measure to a small degree.

In one study, participants were asked to complete explicit and implicit measures of shyness. Subsequently, participants read arguments in favour of shyness that were either strong or weak in persuasive strength. The results of the study revealed that the amount of discrepancy between participants' scores on explicit and implicit measures of attitude moderated the relationship between argument strength and post-message attitudes. Specifically, individuals with high amounts of explicit-implicit ambivalence had more positive attitudes towards shyness, but only after reading strong (but not weak) arguments. The direction of the discrepancy was *not* found to impact this relationship. As such, these findings showed evidence of an argument quality effect among individuals with a high amount of *explicit-implicit* ambivalence. This implies that the content of the arguments was processed more deeply by highly ambivalent individuals, and was subjected to greater levels of scrutiny (see Cacioppo & Petty, 1984; Petty & Cacioppo, 1986). In other words, like with explicit attitudinal ambivalence, it appears that greater amounts of explicit-implicit ambivalence results in people processing relevant information in greater depth.

The robust phenomenon of systematic processing among highly ambivalent individuals was confirmed by Briñol et al. (2006) in a further three studies investigating different attitude objects. In addition, the importance of *information relevancy* was shown in a study that manipulated message frame. In this study, participants first completed explicit and implicit measures of resistance to persuasion before reading either strong or weak arguments for a change in university policies. Importantly, this message was framed so that it either appeared to be related or unrelated to resistance to persuasion. The results of the study showed that individuals with high amounts of explicit-implicit ambivalence

had more positive post-message attitudes towards the introduction of the new university policies after reading strong arguments. However, this only occurred when the message was framed as being relevant. As such, the reduction of explicit-implicit ambivalence occurs when individuals have the opportunity to systematically process information that is *relevant* to the domain of the ambivalence being experienced.

On the basis of this research, it is clear that the systematic processing of relevant information is imperative to resolving the underlying conflict of explicit-implicit ambivalence. However, what is it about systematic processing that allows individuals to resolve explicit-implicit ambivalence? Galdi, Gawronski, Arcuri, and Friese (2012) found that systematic processing of relevant information resulted in convergence of explicitly- and implicitly-measured attitudes. These researchers conducted a study that assessed explicit and implicit measures of attitude towards the inclusion of Turkey into the European Union (EU). One week later, participants had the opportunity to read relevant information before completing the same explicit and implicit measures. For participants who self-reported high levels of certainty in their initial explicitly measured attitude towards the inclusion of Turkey into the EU, after being given the opportunity to systematically process relevant information, implicitly measured evaluations were brought in line with explicit attitudes. In contrast, for participants who were less certain in their initial attitude, systematic processing resulted in explicit evaluations being brought in line with implicitly measured attitudes.

In summary, like with explicit attitudinal ambivalence, research suggests that explicit-implicit attitudinal ambivalence can be reduced via information processing. In particular, when individuals with greater amounts of explicit-

implicit ambivalence are given the opportunity to systematically process information that is *relevant* to the domain of the ambivalence being experienced, favourable attitudes towards the corresponding attitude object are reported (Briñol et al., 2006). Subsequent research has shown that exposure to relevant information results in convergence between explicit and implicit evaluations (Galdi et al., 2012). Taken together, it is clear that individuals with explicit-implicit ambivalence critically examine relevant information – this allows a reduction of the associated conflict, resulting in favourable evaluations.

Sexual Orientation, Concealment, and Sexual Orientation Ambivalence

Sexual orientation is defined as one's sexual identity, attractions, and behaviours (e.g., Fergusson, Horwood, Ridder, & Beautrais, 2005; Savin-Williams, 2006). This section of the chapter describes evidence on the concealing of SO (a self-presentational bias) and the negative effects this has for psychological and physical health. Following this discussion, I form an argument that the experience of ambivalence is a plausible explanation for these negative effects.

Research that has used explicit measures of SO – those that ask directly about sexual identity, attractions, and behaviours – has highlighted that sexual minorities (i.e., gay men, gay women, and bisexual identified individuals) are sometimes motivated to conceal their SO (e.g., Beals, Peplau, & Gable, 2009; Frost, Parsons, & Nanín, 2007; Legate, Ryan, & Weinstein, 2011; Ullrich, Lutgendorf, & Stapleton, 2003). In a study of male and female gay and bisexual individuals, Legate et al. (2011) measured how “out” people were, in addition to levels of autonomy (interpersonal acceptance) and control (restrictive self-expression) with respect to various individuals (e.g., co-workers, friends, and family members). It was found that disclosure of SO was more likely when individuals experienced

higher levels of autonomy as opposed to autonomy-control from others in their lives. Greater concealment of SO was likely to occur when there were higher amounts of pressure to behave in ways deemed by others to be acceptable (i.e., control). Similarly, in a study with a sample of gay men and women, Beals et al. (2009) found a clear association between levels of disclosure and perceived social support from other individuals, suggesting greater concealment in the context of low social support. These findings suggest that sexual minorities are often motivated to present their SO in ways perceived to be socially desirable, particularly in the context of unsupportive social environments.

Recent evidence has also shown that the concealment of SO is not confined to sexual minorities. Vrangalova and Savin-Williams (2012) measured the sexual identity, attraction, and behaviours in an online survey of nearly 1800 men and women. One predominate finding was that when individuals reported having an exclusively straight sexual orientation identity, this did not imply exclusively opposite-sex sexual attraction and behaviours. For instance, among men who reported being exclusively straight, 20% reported non-exclusivity with respect to sexual attraction or sexual partners (i.e., they reported having both same-sex and opposite-sex attraction/partners). Among females this figure was 43%. In addition, other research has shown that substantial proportions of men (53%) and women (77%) who identify as exclusively straight report questioning their SO in terms of same-sex behaviour and attractions (Morgan, Steiner, & Thompson, 2010; Morgan, & Thompson, 2011). Taken together, it is clear that both self-reported straight individuals and sexual minorities may present their SO in ways that are not necessarily congruent with sexual attractions and behaviours.

There are clear parallels between the concealment of SO and ambivalence. For example, if an individual reports their SO identity (e.g., “I am straight”) in a way that conflicts with reported behaviour and attractions (i.e., same-sex behaviour and attraction), it could be said that ambivalence exists. As such, the concealment of SO, like ambivalence, should result in negative consequences. Indeed, research has found this to be the case in both sexual minorities and self-identified straight individuals.

In one study involving nearly 600 gay men Frost et al. (2007) found a significant association between the concealment of SO and self-reported symptoms of depression. Furthermore, the concealment of SO has been found to relate to physical health. Ullrich et al. (2003), in a study of gay and bisexual HIV positive men, measured the concealment of sexual orientation and the progression of HIV infection (CD4 cell count). Interestingly, lower levels of protective CD4 cells, and hence faster progression of HIV infection, were found among men who concealed a gay sexual orientation identity. On the basis of this research, one can infer that when individuals present their SO in ways they perceive to be socially desirable, negative outcomes occur that are reminiscent of those associated with the experience of attitudinal ambivalence.

Similar findings have also been found in self-identified straight individuals. For example, Gattis, Sacco, and Cunningham-Williams (2012) measured the sexual orientation identity, sexual behaviours and sexual attractions in a large epidemiological survey conducted in the United States. Among self-identified straight women who reported same-sex behaviour, there were higher levels of mental health problems in addition to higher levels of substance abuse. Among self-identified straight men who reported same-sex behaviour, higher levels of

alcohol abuse and inhalant use were found. These findings suggest that when straight-identified individuals present their SO in ways that are discrepant with their sexual behaviours, negative outcomes occur that are reminiscent of those associated with the experience of attitudinal ambivalence.

In summary, SO is defined as one's sexual identity, attractions, and behaviours (e.g., Fergusson et al, 2005; Savin-Williams, 2006). Research that has utilised explicit measures of SO has shown the prevalence of self-presentational concerns. Among gay individuals, higher levels of SO concealment are found in environments that lack social support (Beals et al., 2009; Legate et al., 2011). In addition, research has shown that self-identified straight individuals sometimes report a sexual identity that is in conflict with sexual attractions and behaviours (Morgan et al., 2010; Morgan & Thompson, 2011; Vrangalova & Savin-Williams, 2012). The concealment of SO has been found to relate to negative outcomes for psychological and physical health in both gay and straight individuals (Frost et al., 2007; Gattis et al., 2012; Ullrich et al., 2003). Many of these negative effects are similar to those associated with the experience of attitudinal ambivalence. As such, it is plausible that these negative outcomes could be a consequence of ambivalence in thoughts and feelings towards one's SO, highlighting the potential importance of investigating ambivalence in this domain of research.

Explicit-Implicit Sexual Orientation Ambivalence

Based on the research described above, explicit concealment of SO could implicate different automatic, implicit evaluations of one's SO. Such a scenario would result in *explicit-implicit SO ambivalence*, which is defined as the conflict that occurs between individuals' responses on explicit and implicit measures of SO. Before describing hypothesised outcomes of this kind of discrepancy, the chapter

describes recent interest in developing measures of SO designed to assess implicit evaluations of sexual orientation.

Implicit measures of SO fall into two categories: physiological measures and response-time measures. An example of a physiological measure is pupil dilation, which is an indication of bodily arousal (e.g., Bradley, Miccoli, Escrig, & Lang, 2008). In one study, Rieger and Savin-Williams (2012) recorded pupil dilation while participants watched videos of naked men and women. In addition, participants also completed an explicit measure of SO that measured sexual orientation identity, attraction, fantasies, and infatuations. Overall, pupil dilation was found to correspond well with self-reported sexual orientation: Amongst both men and women, straight participants dilated to videos of opposite-sex individuals (i.e., they were more aroused), whereas gay participants dilated more to videos of same-sex individuals. In addition, bisexual male participants were found to dilate more equally to videos of both opposite- and same-sex individuals.

The work described in this thesis uses a response-time based implicit measure of SO. One of the first examples was an IAT of sexual preferences developed by Snowden, Wichter, and Gray (2008). The sexual preferences IAT developed by these researchers assessed speed of categorisation when pictures of erotic men or women shared the same categorical response (a button press) as either sexually attractive or sexually unattractive words. Similar to the findings on pupil dilation, response-time was found to converge with self-reported sexual preferences. Specifically, self-identified straight participants were fast to categorise erotic opposite-sex pictures and sexually attractive words when they shared the same response, implying an automatic sexual preference for opposite-sex individuals. In contrast, straight participants were slow to categorise erotic

same-sex pictures and sexually attractive words. Here, the slow response time is indicative of the task being in conflict with automatic sexual preferences (i.e., straight individuals did not have an automatic preference for same-sex individuals). In contrast, self-identified gay participants were quick to categorise opposite-sex pictures and sexually attractive words when they shared the same categorical response. However, gay individuals were slow to categorise erotic same-sex pictures and sexually attractive words. As such, gay individuals had automatic sexual preferences for same-sex individuals but not opposite-sex individuals.

Thus far, few studies have investigated the effects associated with explicit-implicit SO ambivalence. In the only prior example, Weinstein, Ryan, DeHaan, Przybylski, Legate, and Ryan (2012) investigated whether the relationship between individuals' explicitly and implicitly measured SO was moderated by the amount of experienced autonomy versus control in parental relationships (in a sample where the majority reported being straight). In this study, which used a single-item explicit measure of SO and an adapted evaluative priming task (see Fazio et al., 1995), it was found that when participants perceived high levels of parental control, there was no relation between scores on the explicit and implicit measures of SO. However, a significant correlation between participants' scores on the explicit and implicit measures of SO was found in the context of low levels of parental control. These findings highlight a possible explanation of explicit-implicit SO ambivalence: when explicit and implicit evaluations of SO are discordant, this might be a product of parents pressurising their children to behave in 'acceptable' ways. This finding offers an intriguing first glance at potential correlates of explicit-implicit SO ambivalence.

In addition to this finding, Weinstein et al. (2012) demonstrated that explicit-implicit SO ambivalence was associated with other outcomes. In the study, participants also completed an explicit measure of anti-gay attitudes. Strong anti-gay attitudes were found among participants who self-reported being straight but had an automatic evaluation of their SO as gay.⁴ This finding was interpreted to be a product of *reaction formation* – Weinstein and colleagues argued that such explicitly straight individuals were anti-gay because implicit evaluations of SO (I am gay) *threatened* self-reported evaluations (I am straight). Anti-gay attitudes therefore served to rebuff these negative self-perceptions, reducing the likelihood of self-invalidation. These findings offer further evidence consistent with the argument that explicit-implicit SO ambivalence is associated with negative feelings, *and* that individuals will be motivated to reduce these feelings. As such, it is of fundamental interest to investigate how individuals resolve explicit-implicit SO ambivalence; on account of past research discussed in this review, it is likely that information processing will be a fundamental component in such an investigation.

In summary, this thesis defines explicit-implicit SO ambivalence as the conflict that can occur between responses on an explicit measure of SO and an implicit measure of SO. Recently, there has been interest in developing implicit measures that aim to *indirectly* assess an individuals' perceptions of SO. Some of these measures have utilised physiological techniques, such as recording pupil dilation (i.e., bodily arousal; e.g., Rieger & Savin-Williams, 2012). Other measures, including that utilised by the work in this thesis, use response-time tasks (e.g., Snowden et al., 2008). Very little research has investigated the effects of explicit-

⁴ Explicitly straight and implicitly gay reflects the terminology used in this paper.

implicit SO ambivalence. Extant research has highlighted that explicit-implicit SO ambivalence is associated with important consequences including parental-autonomy, parental autonomy-control, and anti-gay attitudes (Weinstein et al., 2012). As such, the importance of work that investigates the associations between explicit-implicit SO ambivalence, information processing, and wellbeing is abundantly clear.

Overview of the thesis

The empirical component of the thesis contains five chapters. In Chapter Two, Study 1 explored the impact of explicit-implicit SO ambivalence on health and well-being in a sample of straight-identified individuals. This chapter also provides an initial test of whether explicit-implicit SO ambivalence impacts information processing. Chapter Three describes two studies (Studies 2 and 3) that sought to replicate the information processing findings described in Chapter Two, with one of these studies using an alternative paradigm to processing. Chapters Four and Five (Studies 4 and 5) present research describing the effects of explicit-implicit SO ambivalence on well-being and information processing in two independent samples of gay-identified individuals. In the final empirical chapter (Chapter Six), Study 6 presents results on how explicit-implicit SO ambivalence impacts the processing of non-verbal information relevant to sexual orientation. The general discussion is then provided in Chapter Seven.

CHAPTER TWO:
THE AGONY OF A TORN SEXUALITY: AN INITIAL EXPLORATION OF THE
CONSEQUENCES OF EXPLICIT-IMPLICIT SEXUAL ORIENTATION
AMBIVALENCE

Overview of Chapter

This chapter reports a study that examined the impact of explicit-implicit SO ambivalence. Study 1 is discussed in two sections. The first section explores the impact of SO ambivalence on psychological well-being and self-identity. The second offers an initial consideration of the effects of SO ambivalence on information processing. In the study, 70 self-identified straight participants completed explicit and implicit measures of SO in addition to measures of well-being and sexual identity. The findings revealed that greater amounts of explicit-implicit ambivalence related to poorer psychological health (specifically, low reappraisal). Unlike past research, the direction of ambivalence also related to health – poorer self-esteem, life satisfaction, and happiness were observed among individuals who underreported (on the explicit measure of SO) same-sex tendencies that were captured by the implicit measure of SO. The amount and the direction of SO ambivalence also related to perceptions of sexual identity. Specifically, negative perceptions towards sexual identity were reported among those who were open about same-sex tendencies on the explicit measure of SO, but only when the amount of ambivalence was high. Among those who underreported same-sex tendencies (on the explicit-measure of SO), individuals with both high and low amounts of ambivalence reported negative perceptions towards their sexual identity.

STUDY 1, SECTION 1 – SO AMBIVALENCE, WELL-BEING, AND SELF-IDENTITY

Introduction

“The agony of ambivalence”

There is little doubt that the experience of attitudinal ambivalence is aversive and unpleasant (van Harreveld et al., 2009b). As noted in the previous chapter, research on the effects of *explicit* attitudinal ambivalence has found this to be associated with both psychological discomfort (e.g., guilt, unease, anxiety; Monteith, 1996) and physical discomfort (e.g., heightened physiological arousal; van Harreveld et al., 2009a). Of greater relevance to the research of this chapter, the experience of explicit-implicit attitudinal ambivalence has also been found to result in negative outcomes.

Much of this work on explicit-implicit ambivalence has focused on the psychological consequences of discrepant evaluations of self-esteem. In one study, Creemers et al. (2012) had participants complete explicit and implicit measures of self-esteem. The study found an association between the amount of explicit-implicit discrepancy and levels of self-reported depressive symptoms and suicidal ideation. Furthermore, when explicitly measured self-esteem was high and implicitly measured self-esteem was low (otherwise known as *defensive self-esteem*; see Haddock & Gebauer, 2011; Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003), this predicted significantly higher levels of depressive symptoms, suicidal ideation, and loneliness. In a similar vein, Schröder-Abé et al. (2007) found that discrepant scores on explicit and implicit measures of self-esteem were positively associated with a depressive attribution style (e.g., negative life events were explained as being internally caused), nervousness, and more days of impaired physical health. Taken together with research that has studied the

implications of *artificially induced* explicit-implicit attitudinal ambivalence (Rydell & Durso, 2012; Rydell et al., 2008), there is strong evidence that explicit-implicit attitudinal ambivalence has negative consequences for both psychological and physical functioning. As such, a clear question emerges – does the experience of explicit-implicit *sexual orientation (SO) ambivalence* result in negative psychological outcomes among self-identified straight individuals?

The *hypothesised* agony of explicit-implicit SO ambivalence

As stated in the previous chapter, SO is defined as one's sexual identity, attractions, and behaviours. Research that has utilised multifaceted measures of *self-reported* SO, has found that an exclusively straight identity does not necessarily imply exclusivity in terms of sexual attraction and behaviour (e.g., Gattis et al., 2012; Vrangalova & Savin-Williams, 2012) – *importantly* this scenario results in negative outcomes for psychological health.

For instance, Gattis et al. (2012), asked participants to report their *sexual identity* (e.g., which of these categories best describe you: heterosexual (straight), lesbian, gay, bisexual, unsure?), *sexual behaviour* (e.g., in your lifetime, have you had sex with only males, only females, both males and females, or have you never had sex?), and *sexual attraction* (e.g., which best describes you: Are you only attracted to females, mostly attracted to females, equally attracted to males and females, mostly attracted to males...etc.?). Sexual discord was operationalised by assessing the comparability between these different components of SO. The study found that among self-identified straight females who reported discordant (i.e., same-sex) sexual behaviour, there was a greater probability of experiencing a major depressive episode. For self-identified straight males who reported discordant (i.e., same-sex) sexual behaviour, higher levels of alcohol abuse and

inhalant use were found. What might explain the negative outcomes found by Gattis et al. (2012)?

One possibility is ambivalence between different components of SO. Despite progressive gay rights movements and shifts in public opinion, widespread anti-gay attitudes still serve to stigmatise sexual minority status (Herek & McLemore, 2013) – we live in a world where traditional labels of SO, such as “straight” are culturally, socially, and politically normalised (Vrangalova & Savin-Williams, 2012). As such, it is understandable that some individuals will be motivated to affirm a straight identity, despite same-sex feelings. I argue that these concerns elicit ambivalence between different components of SO, resulting with negative outcomes for psychological health. As such, the experience of ambivalence could help to explain the negative outcomes measured by Gattis et al. (2012).

A novel way to address this issue would be to examine the impact of explicit-implicit SO ambivalence on outcomes of psychological well-being. It is plausible that, *if* some self-identified straight individuals are motivated to report their SO in socially desirable ways by affirming a straight identity, these explicit perceptions of SO would be somewhat misaligned with implicit perceptions of SO. As such, I propose that feeling torn between explicit and implicit perceptions of one’s SO could result in negative outcomes. Presently, is there any evidence to support this claim?

At the time of writing this thesis, to my knowledge there is no evidence that has directly investigated consequences of discrepant explicit and implicit evaluations of SO for psychological health. However, in a number of studies, the experience of explicit-implicit SO ambivalence could be an explanation of worse psychological health. In the general introduction, the *concealment* of SO was shown

to result in negative outcomes, many reminiscent of those associated with attitudinal ambivalence. In particular, among sexual minorities (including gay men and women, and bisexual individuals), the concealment of SO is associated with detrimental consequences for both psychological (e.g., depression; Frost et al., 2007) and physical health (e.g., faster progression of HIV infection; Ullrich et al., 2003). But how might the concealment of SO relate to the experience of explicit-implicit SO ambivalence?

The nature of concealment is that individuals present their SO in a way they perceive to be *socially desirable*. In these circumstances, it is understandable that self-reported evaluations of SO could be different to their implicitly measured, automatic evaluations of SO. In other words, it is possible that the motivation to conceal one's SO could attenuate the association between explicit and implicit measures of SO, resulting with explicit-implicit SO ambivalence, and negative psychological effects.

While support for social desirability concerns weakening the association between explicit and implicit measures of attitude is mixed (see Hofman, Gawronski, Gschwendner, Le, & Schmitt, 2005), evidence specific to the domain of SO suggests otherwise. For instance, as described in the previous chapter, Weinstein et al. (2012) found that when participants felt encouraged by their parents to freely express themselves (high autonomy, low control), explicit and implicit measures of sexual orientation converged. However, when parents pressurised their children (low autonomy, high control), there was no relation between scores on explicit and implicit measures of SO. This latter finding is consistent with the idea that social desirability is likely to be linked with explicit-implicit SO ambivalence – when people feel compelled to behave in “acceptable”

ways, this widens the gap between explicit and implicit perceptions of SO. As such, it is possible that findings on the negative effects of concealment (Frost et al., 2007; Gattis et al., 2012; Ullrich et al., 2003) could be a consequence of discrepant explicit evaluations of SO (i.e., those dictated by social desirability) and implicit evaluations of SO. In all, this predicts that explicit-implicit SO ambivalence will be associated with negative effects for psychological health.

Summary and Research Objectives

The evidence presented in this review suggests explicit-implicit SO ambivalence has negative implications for psychological health. First, research has found discrepant explicit evaluations of SO to result in negative effects such as depression and alcohol abuse (Gattis et al., 2012). Second, research has shown the concealment of SO to result in negative effects for both psychological and physical health (e.g., Frost et al., 2007; Ullrich et al., 2003). Third, evidence relevant to the domain of SO has shown social desirability concerns to implicate discrepant explicit and implicit evaluations of SO (i.e., explicit-implicit SO ambivalence; Weinstein et al., 2012). As such, the negative effects of concealing SO could be a product of explicit-implicit SO ambivalence. In conjunction, these points demonstrate the hypothetical agony of explicit-implicit SO ambivalence. To explore the impact of this ambivalence on psychological health, the research described in Section 1 of this chapter makes the following prediction:

Hypothesis 2.1 On the basis of evidence that has shown explicit-implicit ambivalence to have negative outcomes for both physical and psychological health, greater amounts of explicit-implicit SO ambivalence will implicate reduced psychological health.

The research described in Section 1 also assessed the impact of individual differences in the amount and the direction of explicit-implicit SO ambivalence on *perceptions of self-identity*. As mentioned earlier in the introduction, I propose that explicit-implicit SO ambivalence could be a product of self-identified straight individuals being motivated to present their SO in socially desirable ways, producing dichotomy between explicit and implicit evaluations of SO. To the extent that individuals feel compelled to self-report their SO identity in ways felt to confirm socially acceptable norms, this could result in negative feelings towards this self-reported identity. This reasoning is supported by past work that has shown, in samples of gay and bisexual men, the concealment of one's sexual identity makes it difficult to form positive feelings towards that identity (Frable, Wortman, & Joseph, 1997). Therefore, to the extent that explicit-implicit SO ambivalence results in negative perceptions of self-reported SO identity, the following prediction is made:

Hypothesis 2.2 There will be a main effect of the amount of explicit-implicit SO ambivalence on perceptions of self-identity – individuals with greater SO ambivalence will possess more negative perceptions towards their sexual identity relative to those with low ambivalence.

As an exploratory exercise, the study included measures of emotion regulation. Past research has found an association between negative perceptions of SO and emotional regulation. For example, Hatzenbuehler, Dovidio, Nolen-Hoeksema, and Phillips (2009), in a sample of sexual minorities, asked participants to complete explicit and implicit measures of self-stigma (anti-gay attitudes). Participants with implicitly measured anti-gay attitudes engaged in significantly higher levels of rumination and suppression. This implies that when individuals

perceive their sexual orientation negatively, this can affect their ability to cope with psychological distress. It is plausible that this has relevance for the present research – if self-identified straight individuals experience SO ambivalence and this results in negative psychological effects (e.g., negative impacts on wellbeing and sexual-identity), this could also be associated with emotional regulation. Due to the exploratory nature of this, a priori hypotheses are not formed.

Method

Participants

Seventy self-identified straight participants (49 females; $M_{age} = 20.04$ years, $SD = 2.15$ years) participated for course credit.⁵ The sample size is appropriate given the number of predictor variables used in this study (Gpower; Faul, Erdfelder, Lang, & Buchner, 2007). For an analysis of three predictors, Gpower recommends a sample of around 60 participants to achieve a moderate effect size.

Materials

Measures of Sexual Orientation

Developing novel measures of SO. The explicit and implicit measures of SO (described below) were developed in my Masters degree project (Windsor-Shellard, 2011). This overview outlines the rationale for the measures that were developed, and an initial test of the efficacy of these measures (conducted in my Masters project) is footnoted.⁶

⁵ As noted here and throughout this thesis, the samples are predominately female. This is due to the gender composition of the student population in the School of Psychology, Cardiff University. The gender imbalance in the samples described throughout the thesis made it inappropriate to consider gender as a relevant independent variable.

⁶ The efficacy of the explicit and implicit measures of SO was assessed in a Masters project by the author in a sample of 44 straight (22 males) and 25 gay (15 males) participants. In this study,

Explicit measures of SO can take a variety of approaches. For example, the Kinsey Scales (Kinsey, Pomeroy, & Martin, 1948) ask individuals to place themselves on a six-category continuum from *exclusively heterosexual* (individuals who make no physical contact which result in erotic arousal or orgasm, and make no psychic response to individuals of their own sex) to *exclusively homosexual* (individuals who are exclusively homosexual, both in regard to their overt experience and in regard to their psychic reactions). “In-between” categories of SO include *predominately heterosexual but more than incidentally homosexual* (individuals who have more than incidental homosexual experience, and/or if they respond rather definitively to homosexual stimuli), *equally heterosexual and homosexual*, and *predominately homosexual but more than incidentally heterosexual* (individuals who have more overt activity and/or psychic reactions in the homosexual, while still maintaining a fair amount of heterosexual activity and/or responding rather definitively to heterosexual contact). Such scales are widely used in modern day research on SO (e.g., Chivers, Rieger, Latty, & Bailey, 2004; Rieger & Savin-Williams, 2012). However, there are problems with this popular measure (for a review see Sell, 1997). Despite the Kinsey Scales’ attempt to form a

participants completed the explicit and implicit measures of SO described here. For the explicit measure, high levels of reliability were found on items assessing opposite-sex attraction and same-sex attraction in both straight (opposite-sex, $\alpha = .74$; same-sex, $\alpha = .76$) and gay participants (opposite-sex, $\alpha = .75$; same-sex, $\alpha = .74$). In a 2(straight, gay) X 2(male, female) between subjects ANOVA that assessed the difference in responses between straight and gay participants, a significant main effect of sexual orientation was found for items assessing opposite-sex attraction ($F(1,65) = 1371.40, p < .0001$) and same-sex attraction ($F(1, 65) = 1581.39, p < .0001$). These analyses show that this measure discriminates on the basis of sexual orientation.

Split-half reliability analyses were used to assess the implicit measure; high levels of reliability were found for both straight (adjusted $r = .84$) and gay participants (adjusted $r = .90$). In a 2(straight, gay) X 2(male, female) between subjects ANOVA that assessed the difference in D’ scores between gay and straight participants, a significant main effect of sexual orientation was found, $F(1, 65) = 106.82, p < .0001$. As such, this measure discriminates on the basis of sexual orientation. In addition, the D’ scores for both straight ($t(43) = 6.61, p < .0001$) and gay participants ($t(24) = 8.85, p < .0001$) were found to be statistically significant from zero, suggesting that the IAT was measuring a difference in valence between the two critical trials.

continuum between heterosexuality and homosexuality, the approach is still relatively dichotomous in the sense that people are still placed into one of two categories, or even both (to certain degrees; Sell, 1997). Second, the scale was developed at a period in history when being a gay man or a gay woman was classified as being a medical disorder, meaning the scales adopt a diagnostic approach that is unsuitable in the contemporary research context.

In response to problems like these, researchers have adopted various other means to measure SO. For example, Cochran, Sullivan and Mays (2003) asked participants to indicate their sexual-identity by asking participants "Would you describe your sexual orientation as heterosexual, homosexual, or bisexual?" Using a different approach, Sandfort, de Graaf, Bijl, and Schnabel (2001) assessed sexual behaviour by asking participants to disclose whether they had sexual contact in the preceding year, and to specify the gender of their sexual partner(s). Other researchers have also measured SO by asking participants about sexual attractions and fantasies towards opposite- and same-sex individuals (e.g., Klein, Sepekoff, & Wolf, 1985).

Concerns have been raised on the utility of single facet measures of SO. One problem is that more individuals report same-sex attraction and behaviour relative to a self-identified gay identity. For example, Savin-Williams (2006) found that measures of attraction often estimate being gay as two to three times higher than estimates derived on measures of sexual behaviour and identity. In a similar vein, Gattis et al. (2012) operationalised SO by measuring sexual identity, attraction, and behaviour. The findings of this study showed that self-identified straight individuals (both males and females) experienced negative mental health consequences when they reported same-sex behavioural experience. As such, not

only do single facets of SO risk underestimating or overestimating the ratio of straight and gay participants in research, this practice could also overlook some important psychological effects that can only be uncovered when using multi-faceted measures of SO.

On the basis of these issues, and on the recommendations made by previous research (Fergusson et al., 2005; Savin-Williams, 2006), the explicit measure of SO used in this thesis adopts a multi-faceted approach that operationalises SO by considering sexual identity, attraction, and behaviour.

The use of implicit measures to operationalise SO is a more recent development. As described in Chapter One, these measures typically adopt one of two approaches. Physiological measures, such as pupil dilation, have been used to provide a measure of bodily arousal when individuals are exposed to erotic pictures of men and women (e.g., Rieger & Savin-Williams, 2012). Alternatively, response time measures, such as the IAT, have been used to measure spontaneous sexual preferences (e.g., Snowden et al., 2008). The implicit measure of SO described in this thesis adopts a response time technique. The rationale for using this kind of measure is three-fold. First, response time measures are easy to administer – physiological measures necessitate individual testing and the use of technical equipment. Second, research has shown there to be good correspondence between the patterns of findings found on physiological and response time measures of SO (see Snowden & Gray, 2013).

Third, a response time measure of SO was most appropriate given the evaluations I wished to address in my research. The implicit measure of SO used throughout this thesis (described below) assessed spontaneous associations with the sexual-identity categories, straight and gay. Given that past research has

typically used physiological measures of SO to measure sexual attraction (i.e., arousal), the utility of these measures to assess sexual identity is unknown. On the other hand, response time measures such as the IAT have been widely used by research to measure spontaneous associations between the self and identity variables such as gender and self-esteem (e.g., Aidman & Carroll, 2003; Greenwald & Farnham, 2000). These points, in combination, provide a good rationale for the use of an IAT to assess spontaneous evaluations of sexual-identity in my research.

The research described in this thesis could have used implicit measures of sexual attraction that have been validated by past research (i.e., Snowden & Gray, 2013; Snowden et al., 2008). However, my research is more interested in attempting to explain why some individuals may be motivated to report a particular sexual orientation (e.g., straight) whilst having discrepant implicit evaluations of SO (e.g., gay). Addressing ambivalence between self-reported sexual orientation and implicitly measured evaluations of sexual interest represents a completely different approach, and a different research project altogether.

The sexual orientation IAT in my work can also be classified as a *personalised* IAT. Personalised IATs place participants within the measure itself, for example, instead of participants categorising words as either pleasant or unpleasant, these would be classified as things *I* like or things *I* dislike. Proponents of personalised IATs argue that extrapersonal associations can permeate responses on traditional, non-personalised IATs (Olson & Fazio, 2004). The use of a personalised IAT can mitigate the effects of extrapersonal associations (De Houwer, Custers, & De Clercq, 2006; Han, Czellar, Olson, & Fazio, 2010; Han, Olson, & Fazio, 2006).

To summarise, this overview has developed a rationale for the two key measures used to operationalise SO in this thesis. The explicit measure of SO adopts a multi-faceted approach, by measuring sexual-identity, attraction and behaviour. The implicit measure of SO is a personalised IAT of sexual-identity that measures spontaneous associations with the categories, straight and gay.

Explicit measure of SO. Participants were asked to specify their sexual-identity by selecting one of the following categories, straight, gay/ lesbian, bisexual, other. Participants then completed 10 items that assessed opposite- and same-sex attraction and behaviour. Five items ($\alpha=.65$) assessed opposite-sex attraction and behaviour (e.g., I find men attractive; I have sex with men), and five items ($\alpha=.63$) assessed same-sex attraction and behaviour (e.g., I find women attractive; I have sex with women). Participants rated their agreement with each item on a nine-point scale from 1 (definitely not reflective of me) to 9 (definitely reflective of me). For a full list of items see Appendix 1.

Implicit measure of SO. This measure was a personalised IAT that assessed associations with the sexual-identity categories, straight and gay. Reliability was computed using split-half reliability analysis between odd and even trials (Karpinski & Steinman, 2006) and was acceptable (adjusted $r = .72$). Full details on this IAT, including all stimuli used, can be found in Appendix 2. For an example on the set up of this IAT see Figure 2.1 below.

In the first block of trials (10 trials), using two response keys (*Me* on the left side of the keyboard [key E], and *Not me* on the right [key I]), participants categorised words that were representative of themselves or representative of someone else. Representative words corresponded to personal information (e.g., first name, surname, place of birth) specified by the participant at the beginning of

the study. Representative of someone else information was the same, but based on a fictional character.

In Block Two (10 trials), using two response keys (Gay [E] and Straight [I]) participants classified pictures of either gay or straight couples. In all, there were five pictures of gay couples and five pictures of straight couples (taken from publicly available sources). The pictures presented were dependent on participant gender – male participants saw images of male-gay couples, whereas female participants saw images of female-gay couples. All participants saw the same images of straight couples.

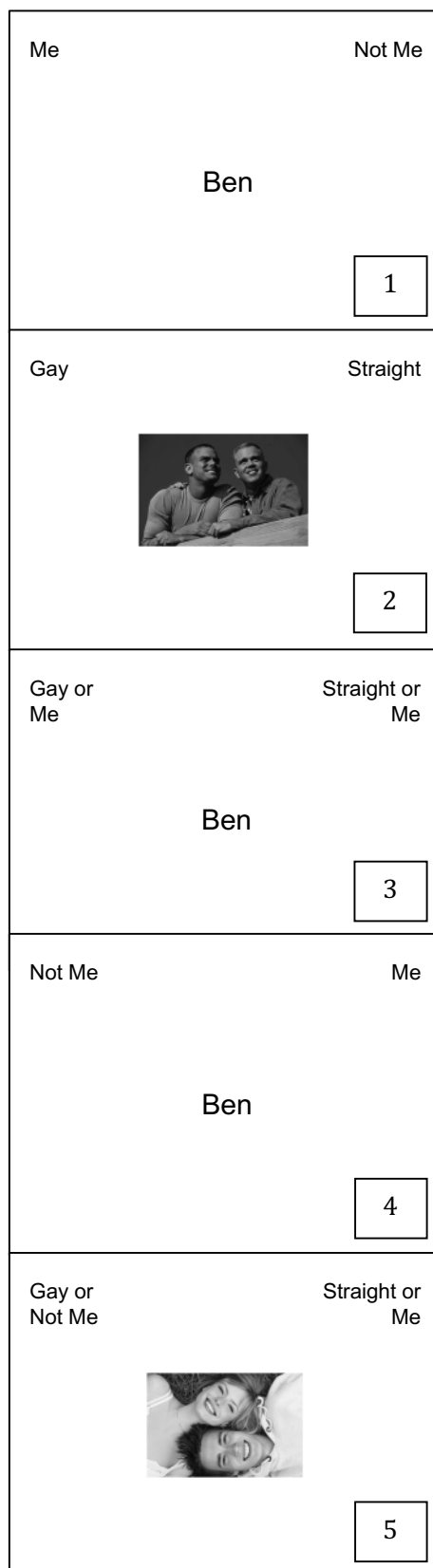
Block Three (20 trials) contained the first set of critical trials where the category labels from stages one and two were combined. One response key (Gay *or* Me; [E]) was used to categorise words that were representative of the participant *or* pictures of gay couples. The other response key (Straight *or* Not me; [I]) was used to categorise words that were not representative of the participant *or* pictures of straight couples.

In Block Four (10 trials), participants repeated stage one. However, the response keys of the category labels changed positions.

The final stage (Block Five) contained the second set of (20) critical trials, this time used to assess the automatic association between a participant and *their* self-identified SO. One response key (Gay *or* Not me; [E]) was used to categorise words that were *not* representative of the participant *or* pictures of gay couples. The other response key (Straight *or* Me; [I]) was used to categorise words that were representative of the participant *or* pictures of straight couples.⁷

⁷ Please see Hofman et al., (2005) for evidence regarding the lack of impact of block order on IAT scores.

Figure 2.1 Blocks 1 through 5 on the SO IAT. Participants are presented with stimuli (words or pictures) in the centre of the screen that are classified relative to the labels at the top of the screen by using the appropriate button press. This set-up shows gay-male couples. Female participants saw gay-female couples.



Computation of IAT effect. The following steps were used to calculate the IAT effect (for the guidelines see Greenwald, Nosek, Banaji, 2003). First, any trials with latencies of greater than 10,000 ms were removed, and if more than 10% of trials were less than 300 ms, the whole data were excluded (no such violations occurred). Second, the mean latencies for blocks 3 and 5 were calculated. Third, the pooled standard deviation across blocks 3 and 5 was calculated. Fourth, the difference in mean latency between blocks 3 and 5 was calculated. Fifth, the D' prime score (the IAT effect) was calculated by dividing the mean latency difference by the pooled standard deviation. This approach was adopted in all of the chapters in this thesis.

Explicit-implicit discrepancy. To derive an index of SO ambivalence, parameters were calculated to quantify the amount and the direction of ambivalence (Briñol et al., 2006; for an overview see Table 2.1). These values were derived by calculating the difference between standardised scores on the explicit and implicit measures of SO. The *amount* of SO ambivalence concerns the absolute value of this difference, such that the greater the value from zero, the greater the discrepancy between scores on the explicit and implicit measures. The *direction* of SO ambivalence concerns the relative positivity or negativity of the standardised explicit-implicit (non-absolute) difference. When a negative value was calculated (indicating that an individual had a *lower* score on the explicit measure of SO relative to the implicit measure [$E < I$]), a dummy code of -1 was used. When a positive value was calculated (indicating that an individual had a *higher* score on the explicit measure of SO relative to the implicit measure [$E > I$]), a dummy code of +1 was used. Thus, for this self-reported straight sample, there were two directions of SO ambivalence: (a) those who reported being *less straight* on the

explicit measure of SO relative to the implicit measure ($E < I$), and (b) those who reported being *more straight* on the explicit measure of SO relative to the implicit measure ($E > I$).

Table 2.1 Table showing the amount (2 levels) and the direction (2 levels) of explicit-implicit SO ambivalence.

The direction of SO ambivalence	The amount of SO ambivalence	
	<i>High</i>	<i>Low</i>
Explicit score < Implicit score ($E < I$)	Reports being <i>less straight</i> on the explicit measure of SO relative to the score on the implicit measure of SO, to a large degree.	Reports being <i>less straight</i> on the explicit measure of SO relative to the score on the implicit measure of SO, to a small degree.
Explicit score > Implicit score ($E > I$)	Reports being <i>more straight</i> on the explicit measure of SO relative to the score on the implicit measure of SO, to a large degree.	Reports being <i>more straight</i> on the explicit measure of SO relative to the score on the implicit measure of SO, to a small degree.

Measures of Well-Being

The following measures were included because past research (as described in the introduction to this section of the chapter) has found an association between explicit-implicit attitudinal ambivalence and general psychological well-being (e.g., Rydell & Durso, 2012).

Measures of self-esteem. The study used explicit (ESE) and implicit (ISE) measures of self-esteem. The explicit measure was the Single Item Self-Esteem measure (Robins, Hedin, & Trzesniewski, 2001). Participants indicated their

agreement to the statement “I have high self-esteem” (1= does not apply at all; 9= applies completely). This measure is highly correlated with multi-item measures and has temporal stability (Robins et al., 2001).

The implicit measure was the Single Item Name-Liking measure (Gebauer, Riketta, Brömer, & Maio, 2008). Participants were asked “How much do you like your name, in total?” (1= not at all; 9= very much). This measure has high test-retest reliability and is correlated with other indirect measures of self-esteem (Gebauer et al., 2008).

Life satisfaction. The Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) has five items measuring global cognitive judgements of life satisfaction ($\alpha = .83$). Sample items include “In most ways my life is close to my ideal” and “If I could live my life over, I would change almost nothing.” The items were rated on a nine-point scale (1= strongly disagree; 9= strongly agree). For a full list of items, see Appendix 3.

Happiness. The Global Subjective Happiness Scale (Lyubomirsky & Lepper, 1999) has four items ($\alpha = .83$), with the response scale to each item different. Sample items include “In general, I consider myself...” (1= not a very happy person; 9= a very happy person) and “Some people are generally not very happy. Although they are not depressed, they never seem to be as happy as they might be. To what extent does this characterization describe you?” (1= not at all; 9= a great deal). For a full list of items, see Appendix 4.

Measures of emotion regulation

Reappraisal and suppression. The emotion regulation questionnaire assesses individual tendencies of reappraisal and suppression (Gross & John, 2003). Six items assessed reappraisal ($\alpha = .87$). Sample items include “I control my

emotions by changing the way I think about the situation I'm in" and "When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about." Four items assessed suppression ($\alpha = .72$). Sample items include "I control my emotions by not expressing them" and "I keep my emotions to myself." For both measures, participants responded using a nine-point scale (1= strongly disagree; 9= strongly agree). For a full list of items, see Appendix 5.

Rumination. Ten items were used to assess levels of self-focused attention ($\alpha = .77$; Treynor, Gonzalez, & Nolen-Hoeksema, 2003). Participants are initially told that they will be shown a number of statements that might be relevant for when feeling down, sad or depressed. Sample items include "I think "what am I doing to deserve this"" and "I analyse recent events and try to understand why I feel the way I do." Participants indicated their agreement with each using a nine-point scale (1= almost never; 9 = almost always). For a full list of items, see Appendix 6.

Measures of self-identity

The measures are a modified version of Cameron's (2004) three-factor model of social identity. These factors are (1) Centrality: how central group membership is to the sense of self, (2) Affect: positive and negative emotions felt towards group membership, and (3) Ties: the social connections and commonalities with other group members. This measure was chosen for two reasons. First, the measure was developed by Cameron to be applicable to a wide-variety of group memberships. Second, Cameron found strong and convergent evidence for his three-factor model of identity in a number of different samples totalling more than 1000 participants.

SO as a component of the self (centrality). This measure was based on the *centrality* facet of Cameron's (2004) social identity measure. Seven items were adapted to SO ($\alpha = .80$). Sample items include "I often think about the fact that I am straight" and "Overall, being straight has very little to do with how I feel about myself" (reverse scored). The items were rated on a nine-point scale (1= strongly disagree; 9= strongly agree). Please see Appendix 7 for a fuller account on this measure.

Affect felt towards one's sexual orientation. This measure was based on the *affect* facet of Cameron's (2004) social identity measure. Five items were adapted to SO ($\alpha = .69$). Sample items include "In general, I am glad to be straight" and "I often regret that I am straight" (reverse scored). The items were rated on a nine-point scale (1= strongly disagree; 9= strongly agree). Please see Appendix 7 for a fuller account on this measure.

Social connectedness with other straight individuals (ties). This measure was based on the *ties* facet of Cameron's (2004) social identity measure. Six items were adapted to SO ($\alpha = .85$). Sample items include "I have a lot in common with other straight people" and "I find it difficult to bond with other straight people" (reverse scored). The items were rated on a nine-point scale (1= strongly disagree; 9= strongly agree). Please see Appendix 7 for a fuller account on this measure.

Procedure

The study was conducted using DirectRT (Jarvis, 2008). Participants completed the explicit measure of SO prior to the measures well-being, emotional

regulation, and self-identity. The implicit measures of SO was completed at the end of the study.⁸

Results

Descriptive statistics

Sexual orientation measures. As would be expected, this sample of straight-identified participants were significantly more attracted to opposite-sex individuals ($M = 8.40, SD = .73$) than same-sex individuals ($M = 1.71, SD = .89; t(69) = 47.79, p < .0001$). The implicit measure of SO showed an IAT effect indicative of a straight SO ($MD' = .67, SD = .42$). This value was statistically different from zero ($t(69) = 13.32, p < .0001$), indicating that the measure was assessing a difference in valence between the critical blocks.

Responses on the explicit and implicit measures of SO were not significantly correlated, $r(68) = .10, p = .43$.

Relationships among measures

Sexual orientation measures

A positive association was found between scores on the explicit measure of SO and self-identity, specifically, scores on the affect factor, $r(68) = .25, p = .04$. As such, participants who were more straight on the explicit measure of SO felt more positive towards their SO.

Interestingly, scores on the implicit measure of SO were positively associated with self-identity, specifically, scores on the centrality ($r(68) = .25, p = .04$), affect ($r(68) = .30, p = .01$), and ties ($r(68) = .29, p = .02$) factors. This demonstrates that participants who were more straight on the implicit measure of

⁸ Please see Hofman et al. (2005) for lack of evidence on explicit-implicit measure ordering on their correlation. The decision to have the explicit measure first and the implicit measure last was based on procedures used by similar research (e.g., Snowden & Gray, 2003; Weinstein et al., 2012).

SO reported more positive outcomes associated with their identification as a straight individual: Such individuals felt that their SO was more central to their sense of self, they were more positive towards their SO, and they felt more connected to other straight individuals. Similarly, participants who were less straight reported more negative outcomes associated with their identification as a straight individual.

Well-being and Identity Measures

Self-esteem. The explicit and implicit measures of self-esteem were found to be positively associated, $r(68) = .29, p = .02$.

Measures of well-being. As would be expected, there were substantial correlations among the measures of well-being used in this study (see Table 2.2).

Measures of emotion regulation. As would be expected, there were substantial correlations among the measures of emotion regulation used in this study (see Table 2.2).

Self-identity - Centrality, affect, ties. As would be expected, these measures were highly correlated (see Table 2.2).

Table 2.2 Summary of Correlations, Means, and Standard Deviations

Measure	1	2	3	4	5	6	7	8	9	10
1. Explicit SO	—	.10	-.12	.02	.01	.07	.12	-.12	.01	.00
2. Implicit SO	.10	—	.08	.12	.20	.18	.11	-.05	-.09	.23
3. Explicit self-esteem	-.12	.08	—	.29*	.63**	.61**	.47**	-.28*	-.45**	.27
4. Implicit self-esteem	.02	.12	.29*	—	.38**	.13	.33**	-.03	-.03	.30
5. Life satisfaction	.01	.20	.63*	.38**	—	.58**	.41**	-.35**	-.57**	.11
6. Happiness	.07	.18	.61**	.12	.58**	—	.49**	-.31**	-.51**	.00
7. Reappraisal	.12	.11	.47*	.33**	.41**	.48**	—	.00	-.14	.20
8. Suppression	-.02	-.05	-.28*	-.03	-.35**	-.31**	-.02	—	.24*	.00
9. Rumination	.01	-.05	-.45**	-.03	-.57**	-.51**	-.14	.24*	—	.11
10. Centrality	.07	.25*	.27*	.30*	.13	.01	.23	.06	.14	—
11. Affect	.25*	.30*	.08	.31**	.14	.10	.26*	-.21	.00	.46
12. Ties	.16	.29*	.10	.13	.15	.22	.12	-.25*	.00	.32

* $p < .05$. ** $p < .01$.

Feeling torn about one's sexuality: Consequences for psychological well-being

In a regression analysis, individual differences in the amount and the direction of SO ambivalence and the respective interaction were included as the independent variables. Owing to the measures of well-being being correlated (explicit self-esteem, implicit self-esteem, life satisfaction, happiness; see Table 2.1), the dependent variable was a combined index of the standardised means on each of these measures ($M = -.07$, $SD = .76$; $\alpha = .75$). In support of hypothesis 2.1, a greater amount of ambivalence was marginally associated with more negative psychological well-being, $\beta = -.46$, $t(66) = -1.96$, $p = .06$. No other effects approached significance (all $ps > .22$).

Feeling torn about one's sexuality: Consequences for emotion regulation

Reappraisal. In a regression analysis, individual differences in the amount and the direction of SO ambivalence and the respective interaction were included as the independent variables. Self-reported reappraisal was the dependent variable. The analysis revealed a significant main effect of the amount of SO ambivalence, $\beta = -.29$, $t(65) = -2.38$, $p = .02$. Individuals with high amounts of SO ambivalence were less able to re-evaluate negative life events in a positive manner. No other effects were significant (all $ps > .48$).⁹

Suppression. In a regression analysis, individual differences in the amount and the direction of SO ambivalence and the respective interaction were included as the independent variables. Self-reported suppression was entered as

⁹ Lower degrees of freedom are due to one participant not completing this measure.

the dependent variable. As noted in Table 2.3, individual differences in SO ambivalence were unrelated to suppression scores (all $ps > .36$).

Rumination. In regression analyses, individual differences in the amount and the direction of SO ambivalence and the respective interaction were included as the independent variables. Self-reported rumination was entered as the dependent variable. As noted in Table 2.3, individual differences in SO ambivalence were unrelated to suppression scores (all $ps > .29$).

Feeling torn about one's sexuality: Consequences for self-identity

In a regression analysis, individual differences in the amount and the direction of SO ambivalence and the respective interaction were included as the independent variables. Given the correlations among centrality, affect, and ties, the dependent variable was the mean of all responses on these measures (18 items; $\alpha = .86$; $M = 6.09$, $SD = 1.12$). This analysis revealed a significant main effect of the amount of SO ambivalence, $\beta = -.29$, $t(66) = -2.47$, $p = .02$. This effect showed that individuals with high amounts of SO ambivalence overall had a less positive identification with a straight SO. In addition, the analysis revealed a significant main effect of the direction of SO ambivalence, $\beta = -.61$, $t(66) = -2.69$, $p = .01$. Individuals who were more straight on the explicit measure of SO relative to the implicit measure overall had a less positive identification with a straight SO.

These main effects were qualified by a (marginally) significant interaction between the amount and the direction of SO ambivalence, $\beta = .41$, $t(66) = 1.82$, $p = .07$ (see Figure 2.2). First, among those who report being *less straight* on the explicit measure of SO relative to the implicit measure, those with high amounts of SO ambivalence have a significantly less positive identification with a straight

SO when compared to those with low amounts of ambivalence, $\beta = -.71$, $t(66) = -2.76$, $p = .01$, $d = .68$. Second, among those who report being *more straight* on the explicit measure of SO relative to the implicit measure, individuals with high and low amounts of ambivalence have an equally less positive identification with a straight SO, $\beta = -.11$, $t < 1$.

Figure 2.2 The impact of the amount (separate lines) and the direction (x-axis) of explicit-implicit SO ambivalence on SO Identity (i.e., an index that combines centrality, affect, and ties)

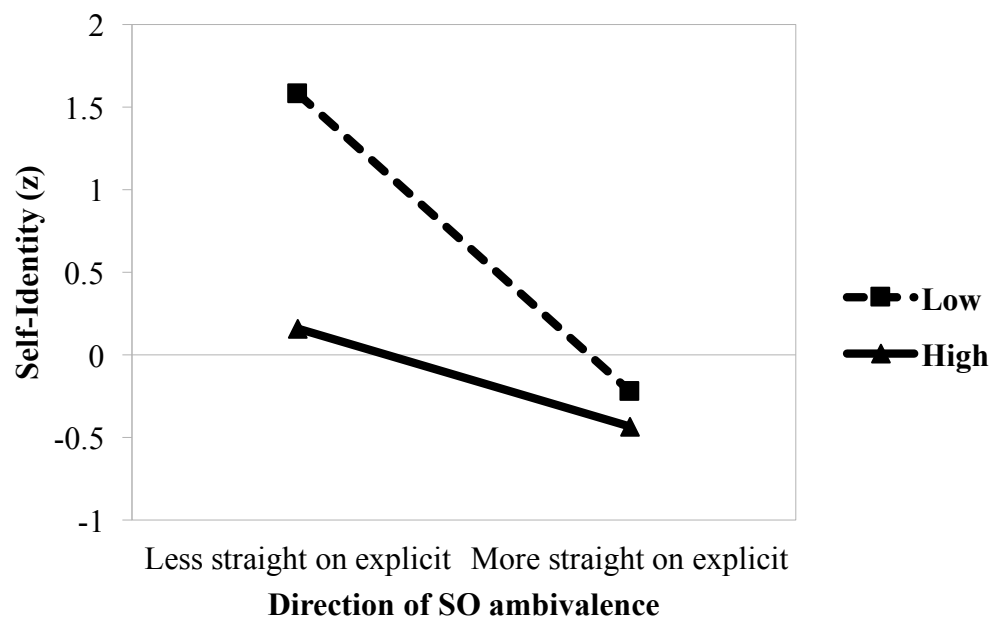


Table 2.3 Summary of standardised regression coefficients (β). Columns detail individual differences in SO ambivalence; rows detail measures.

	Amount of SO ambivalence	Direction of SO ambivalence	Amount x direction
Well-being	-.46†	.15	.25
Reappraisal	-.29*	-.17	.16
Suppression	.11	.22	-.17
Rumination	-.11	.25	-.15
Self-identity	-.29*	-.61**	.41†

** $p < .01$, * $p < .05$, † $p \leq .07$

Discussion

This component of the study was designed to investigate the impact of explicit-implicit SO ambivalence on psychological health and self-identity. It was predicted that greater SO ambivalence would be associated with negative outcomes for psychological health (hypothesis 2.1). In addition, the research predicted that greater SO ambivalence would result in negative perceptions of self-identity (hypothesis 2.2). These will be discussed in turn.

Feeling torn about one's sexuality: Consequences of explicit-implicit SO ambivalence for psychological health

In support of hypothesis 2.1, and in line with past research on the negative effects of ambivalence (e.g., Briñol et al., 2006; Creemers et al., 2012; Rydell & Durso, 2012; van Harreveld et al., 2009b), greater amounts of explicit-implicit SO ambivalence had negative psychological consequences. First, greater amounts of SO ambivalence were associated with lower levels of psychological

well-being on an index that comprised (explicit and implicitly measured) self-esteem, life-satisfaction and happiness. Second, greater amounts of SO ambivalence were associated with significantly lower levels of cognitive reappraisal. This latter finding shows that SO ambivalence could impact other processes (e.g., reappraisal). Cognitive reappraisal is the ability to reinterpret the meaning of life events so that their emotional impact is reduced (Ray, Ochsner, Cooper, Robertson, Gabrieli, & Gross, 2005). Low levels of reappraisal have been found to implicate greater anger and negative emotion (Mauss, Cook, Cheng, & Gross, 2007). As such, individuals with high amounts of SO ambivalence might have a reduced ability to interpret negative and challenging life events in ways that reduce their emotional impact, potentially increasing the likelihood of experiencing worse psychological health.

Feeling torn about one's sexuality: Consequences of explicit-implicit SO ambivalence for self-identity

In support of hypothesis 2.2, the experience of explicit-implicit SO ambivalence was associated with negative perceptions of self-identity. The findings demonstrated that both the amount and the direction of SO ambivalence had consequences for an outcome variable that encompassed three aspects of self-identity - *centrality* (the extent to which SO is seen as part of the self), *affect* (the amount of positivity/negativity felt towards SO), and *ties* (social connectedness with other straight individuals). In particular, the research found a significant effect of the amount of SO ambivalence on perceptions of self-identity – those who experienced greater amounts of SO ambivalence felt more detached from their sexuality, felt more negative towards their sexuality, and reported fewer social connections with other self-identified straight individuals.

Interestingly, the research also found a significant main effect of the direction of SO ambivalence on self-identity. This effect revealed negative outcomes among those who reported being more straight on the explicit measure of SO relative to their score on the implicit measure – these individuals felt more detached from their sexuality, felt more negative towards their sexuality, and reported fewer social connections with other self-identified straight individuals.

Another novel finding was that these main effects were qualified by a marginally significant interaction between the amount and the direction of SO ambivalence. The interaction revealed two different effects that might explain how explicit-implicit SO ambivalence produces a negative self-identity. First, among those who reported being less straight on the explicit measure of SO relative to the implicit measure, those with high amounts of SO ambivalence felt more detached from, and felt more negative towards, their sexuality in addition to reporting fewer social connections with other self-identified straight individuals. As such, for this direction of SO ambivalence, it suggests that a negative sexual identity is a consequence of the magnitude of discrepancy between scores on the explicit and implicit measures of SO. In line with past research, individuals with greater amounts of explicit-implicit ambivalence experienced more negative psychological effects (e.g., Rydell et al., 2008; Rydell & Durso, 2012), characterising how torn they felt towards their sexual identity.

Second, among those who reported being more straight on the explicit measure of SO relative to their score on the implicit measure, those with both high and low amounts of SO ambivalence felt more detached from, and felt equally negative towards their sexuality, in addition to reporting fewer social

connections with other self-identified straight individuals. As such, for this direction of SO ambivalence, it suggests that a negative sexual identity is *not* the result of sizeable differences in the magnitude of the discrepancy between scores on the explicit and implicit measures of SO. Instead, it is likely that the precise implication of this direction of ambivalence elicits the observed effects: these individuals report predominately opposite-sex attraction and sexual behaviours, however responses on the implicit measure of SO reveal a relatively weaker identity with being straight. As such, it is plausible that these individuals could be concealing aspects of same-sex attraction and behaviour, resulting in negative self-identity. This pattern is in line with past research that found in surveys of gay and bisexual men that the concealment of SO made it more difficult for individuals to form a positive SO identity (Frable et al., 1997).

A brief summary of the findings

In Chapter One, and in the introduction to this chapter, the negative effects of ambivalence on psychological health were described: ambivalence is an aversive and unpleasant state that induces feelings of psychological discomfort, producing pervasive consequences for psychological health (e.g., Creemers et al., 2012; Rydell & Durso, 2012; Schröder-Abé et al., 2007; van Harreveld et al., 2009b). The research described in this part of the chapter contributes to extant literature by showing the experience of explicit-implicit SO ambivalence also has negative consequences for psychological health and self-identity. In addition, this research clearly showed that both the amount *and* the direction of SO ambivalence are important predictors of self-identity.

STUDY1, SECTION 2 – A FIRST GLANCE AT THE EFFECTS OF EXPLICIT- IMPLICIT SO AMBIVALENCE ON INFORMATION PROCESSING

Introduction

As stated in the overview to this chapter, Study 1 also examined the effects of explicit-implicit SO ambivalence on information processing. In Section 1, it was found that explicit-implicit SO ambivalence is associated with worse psychological health and negative perceptions of self-identity. Past research has shown that negative effects like these could be a result of the aversive nature of ambivalence (e.g., van Harreveld et al., 2009b; Rydell & Durso, 2012). As such, to the extent that the negative effects found in Section 1 are consequences of ambivalence, it is understandable that explicit-implicit SO ambivalence will relate to attempts to resolve the ambivalence.

In Chapter One, it was shown that individuals could resolve explicit-implicit attitudinal ambivalence by systematically processing ambivalence-relevant information. For instance, Briñol et al. (2006) found that individuals with greater amounts of ambivalence between scores on explicit and implicit measures of shyness had a more positive attitude towards shyness after reading strong (but not weak) arguments on its desirability. As such, greater amounts of ambivalence motivate systematic processing of relevant information. Subsequent research has also shown the processing of relevant information to result in convergence of explicit and implicit evaluations (Galdi et al., 2012), reducing the associated conflict. On the basis of this past research, the present consensus in the literature is that individuals with *greater amounts* of explicit-implicit ambivalence systematically process ambivalence-relevant information.

In line with this past research, and on account of the findings described in Section 1, it is likely that the amount of explicit-implicit SO ambivalence will relate to the systematic processing of information relevant to sexuality – systematic processing could provide individuals with greater amounts of ambivalence the opportunity to resolve their ambivalence. As such, in this second section of the chapter, the following prediction is made:

Hypothesis 2.3 There will be a main effect of the amount of explicit-implicit SO ambivalence on information processing – individuals with greater amounts of SO ambivalence will engage in more systematic processing relative to those with low amounts of ambivalence.

In Section 1 of this chapter, novel evidence was found suggesting that the amount *and* the direction of explicit-implicit SO ambivalence contribute to negative perceptions of self-identity. First, among those who reported being less straight on the explicit measure of SO relative to the implicit measure, those with high amounts of SO ambivalence (when compared to those with low amounts of SO ambivalence) felt more detached from, and felt more negative towards, their sexuality in addition to reporting fewer social connections with other self-identified straight individuals. Second, among those who reported being more straight on the explicit measure of SO relative to their score on the implicit measure, those with both high and low amounts of SO ambivalence felt more detached from, and felt more negative towards, their sexuality in addition to reporting fewer social connections with other self-identified straight individuals.

To the extent that these findings might be a consequence of the negative effects of SO ambivalence, the following prediction is made:

Hypothesis 2.4 There will be an interaction between the amount and the direction of explicit-implicit SO ambivalence on information processing. Among those who report being less straight on the explicit measure of SO relative to the implicit measure, individuals with high amounts of ambivalence will engage in more systematic processing of SO-relevant information (when compared to those with low ambivalence). Among those who report being more straight on the explicit measure of SO relative to the implicit measure, individuals with high and low amounts of SO ambivalence will engage in comparably high amounts of systematic processing.

The measurement of systematic information processing

Systematic information processing can be assessed in a variety of ways. For example, after reading information on a particular topic, participants could be asked to list their thoughts in response to the information that was read (e.g., Jonas et al., 1997; Maio et al., 1996; Nordgren, van Harreveld, & van der Pligt, 2006; Petty & Cacioppo, 1986) – the number of thoughts is taken to be an index of the amount of relevant thinking. Other research has used an argument quality manipulation to determine the depth of processing (e.g., Briñol et al., 2006; Maio et al., 1996). An argument quality effect is a consequence of strong arguments activating a *central route* of processing, where individuals pay close attention to argument content. On the other hand, weak arguments activate a *peripheral*

route of processing, where individuals pay close attention to superficial qualities (e.g., the number of arguments; see Petty & Cacioppo, 1984). As such, when individuals are exposed to certain kinds of information, the resulting attitude can be used to assess the degree to which the information was processed. Regardless of the measure used to assess systematic processing, there is one common property – the measures provide an indication of cognitive response that is the “thoughts that pass through a person’s mind as he or she anticipates, receives, or reflects upon a message...” (Cacioppo & Petty, 1981, p. 310).

In the studies in this thesis, an alternative measure of cognitive response was used to assess systematic processing. Specifically, the research used the amount of time it took participants to read and respond to *all* items of the explicit measure of SO. The rationale for using this dependent measure is outlined below.

Different strands of research have indicated that individuals spend more time reading information when it is of greater personal relevance. For example, Pratkanis and Greenwald (1993) presented participants with information on four fictitious shopping products before asking them to pick two of the products to go onto their shopping list. Subsequently, participants read messages on a brand of products that was either based on previously selected products (high personal relevance), or on products that were not chosen (low personal relevance). In the context of high personal relevance, more time was spent reading the information – because the information was of greater personal relevance, more time was devoted to its processing. These findings imply that when individuals are exposed to information that is of high personal relevance,

more attention is allocated to processing (as indicated by reading time; see also Chaiken, 1980; Edwards & Smith, 1996).

Summary

The findings described in Section 1 of this chapter found that individual differences in both the amount *and* the direction of explicit-implicit SO ambivalence implicated negative psychological outcomes. On the basis of past research (Rydell & Durso, 2012; Rydell et al., 2008), these outcomes are a likely consequence of SO ambivalence producing an internal state of tension and discomfort then used by individuals to interpret their psychological health. As such, it is understandable that individuals will be motivated to reduce the effects of SO ambivalence. Past research suggests that this is achievable via the systematic processing of relevant information (Briñol et al., 2006; Galdi et al., 2012). In the following studies, the amount of time taken by participants to read and respond to questions on both same- and opposite-sex attraction is used to measure the level of processing. The rationale for this measure is based on past research that has shown an association between the systematic processing of information and the amount of time it takes to read such information (Chaiken, 1980; Edwards & Smith, 1996; Pratkanis & Greenwald, 1993).

Method

Responding to explicit questions on sexual orientation. The mean amount of time required by a participant to read and respond to all questions on the explicit measure of SO was used to give an indication of processing. The time was calculated from the moment an item appeared on the screen to when a participant responded to the item ($M = 2768.24\text{ms}$, $SD = 953.18$). There was no difference in response time to items measuring opposite-sex attraction ($M =$

2703.49ms, $SD = 122.25$) and same-sex attraction ($M = 2833.00$ ms, $SD = 149.57$), $t(69) < 1$. There was a significant positive correlation in response time between items measuring opposite- and same-sex attraction, $r(68) = .40$, $p = .001$. As such, a single index of response time was computed.

Results

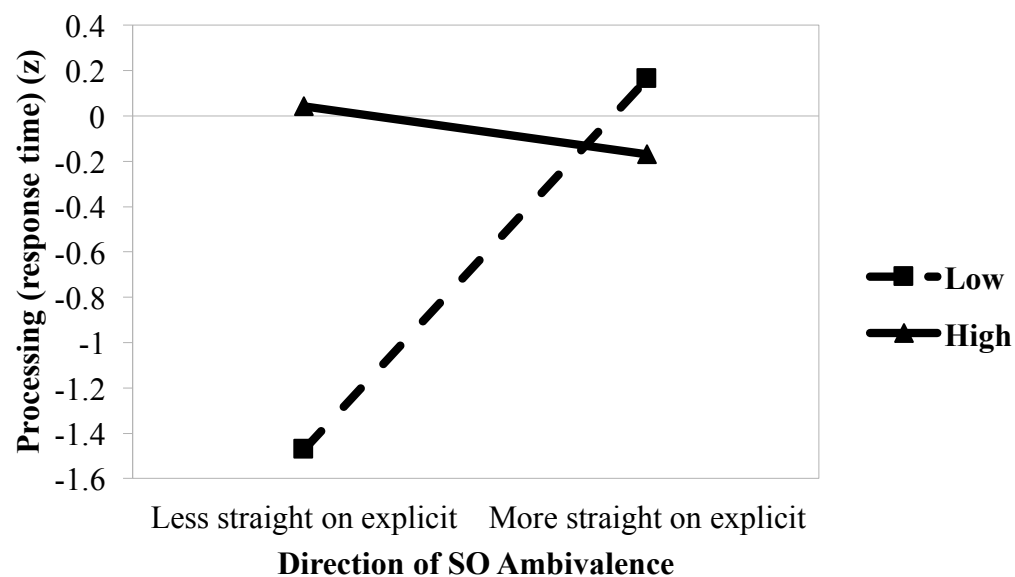
Feeling torn about one's sexuality: Consequences of explicit-implicit SO ambivalence for information processing

In a regression model the amount and the direction of ambivalence and their interaction were used as the independent variables. The dependent variable was the mean time taken to read and respond to all questions on the explicit measure of SO. In line with hypothesis 2.3, the analysis revealed a marginally significant main effect of the amount of SO ambivalence on reading time, $\beta = .29$, $t(66) = 1.78$, $p = .08$. Greater ambivalence was associated with longer response times to explicit questions about sexuality. In support of hypothesis 2.4, the main effect was qualified by an interaction between the amount and direction of ambivalence, $\beta = -.62$, $t(66) = -2.78$, $p = .01$ (see Figure 2.3).

Breaking down the interaction, there was a clear distinction among those with high and low amounts of SO ambivalence when individuals reported being less straight on the explicit measure of SO relative to their score on the implicit measure of SO. In this directional context, those with greater SO ambivalence engaged in more systematic processing of SO-relevant information relative to those with low amounts of ambivalence, $\beta = .76$, $t(66) = 2.91$, $p = .01$, $d = .72$. Among individuals who reported being more straight on the explicit measure of SO relative to the implicit measure of SO, there was no observable difference as a

function of the amount of ambivalence. In other words, those with low and high amounts of ambivalence deliberated equally highly about their SO, $\beta = -.17, t < 1$.

Figure 2.3 The impact of the amount (separate lines) and direction (x-axis) of SO ambivalence on information processing (response time measure).



Discussion

The aim of Section 2 of this chapter was to provide an initial exploration of the effects of individual differences in the amount and the direction of explicit-implicit SO ambivalence on the processing of ambivalence-relevant information. In support of hypothesis 2.3, there was a (marginal) main effect of the amount of explicit-implicit SO ambivalence on processing. In line with past research that has found an associative link between reading time and information processing (Chaiken, 1980; Edwards & Smith, 1996; Pratkanis & Greenwald, 1993), this finding implies that individuals with high ambivalence engaged in deeper, systematic processing of direct information relevant to SO. Moreover, as

described in Chapter One, this finding also supports past work that has shown greater amounts of explicit-implicit ambivalence to result in the systematic processing of information that is relevant to the domain of the ambivalence being experienced (Briñol et al., 2006).

Importantly, this finding corresponds to that described in Section 1 on psychological health and self-identity. Specifically, in Section 1 it was shown that individuals with greater amounts of SO ambivalence were found to have low levels of cognitive reappraisal in addition to negative perceptions of self-identity, with ambivalence being a likely cause (e.g., Rydell & Durso, 2012; Rydell et al., 2008). The findings described in Section 2 show that individuals with greater amounts of ambivalence also engaged in systematic processing. As such, it is plausible that the deep and systematic processing of SO-relevant information demonstrates a motivation to reduce the negative effects associated with the experience of high amounts of SO ambivalence.

In line with hypothesis 2.4, an interaction between the amount and the direction of SO ambivalence on processing was found. This interaction revealed two key effects. First, among those who reported being less straight on the explicit measure of SO relative to their score on the implicit measure of SO, individuals with high (but not low) ambivalence took more time to read and respond to explicit questions on both same- and opposite-sex attraction and behaviour. This implies that individuals with high ambivalence in this directional context engaged in deeper, systematic processing of SO relevant information in an attempt to resolve their ambivalence (Briñol et al., 2006; Chaiken, 1980; Edwards & Smith, 1996; Pratkanis & Greenwald, 1993). Second, among individuals who reported being more straight on the explicit measure of SO

relative to the implicit measure, reading time was comparable (and high) between those with both high and low amounts of SO ambivalence. This implies that individuals with high and low amounts of ambivalence in this directional context engaged in deeper, systematic processing of relevant information.

This interactive pattern is *novel* relative to past research on explicit-implicit attitudinal. Importantly, the interaction between the amount and the direction of SO ambivalence corresponds to findings described in Section 1 on self-identity – findings where ambivalence was described as a likely cause (Rydell & Durso, 2012; Rydell et al., 2008). In particular, among individuals who reported being less straight on the explicit measure of SO relative to their score on the implicit measure, those with high (but not low) amounts of ambivalence, had negative perceptions of self-identity. Among those who reported being more straight on the explicit measure of SO relative to the implicit measure, individuals with high and low amounts of ambivalence had negative perceptions of self-identity. The research described in this section of the chapter confirms that this pattern of results also corresponds to systematic processing. As such, it is plausible that the deep and systematic processing of SO-relevant information demonstrates a motivation to reduce the negative effects associated with individual differences in the amount and the direction of explicit-implicit SO ambivalence.

General Summary

The research described in this chapter aimed to provide an initial investigation into the effects of individual differences in the amount and the direction of explicit-implicit SO ambivalence. Study 1 had two strands. Section 1

described findings on the effect of SO ambivalence on psychological health and self-identity. Here evidence was described showing greater amounts of SO ambivalence to have negative implications for psychological well-being and emotion regulation. Further, individual differences in the amount *and* the direction of SO ambivalence related to perceptions of self-identity. This interaction revealed two key effects. First, among those who reported being less straight on the explicit measure of SO relative to their score on the implicit measure, those with high (but not low) amounts of ambivalence had negative perceptions of self-identity. Second, among those who reported being more straight on the explicit measure of SO relative to the implicit measure, individuals with high and low amounts of ambivalence had negative perceptions of self-identity. In Section 2 a similar pattern of findings was found when using a measure of systematic processing. First, individuals with high SO ambivalence processed SO-relevant information, and second, there was an interaction between the amount and the direction of SO ambivalence on processing. In all, the findings in this chapter imply that systematic processing of SO-relevant information occurs in an attempt to resolve the negative effects of individual differences in the amount and the direction of SO ambivalence. The next chapter examines replications of this information processing effect.

CHAPTER THREE:
SEXUAL ORIENTATION AMBIVALENCE AND INFORMATION PROCESSING –
TWO REPLICATIONS

Overview of Chapter

This chapter reports two studies that build on the information processing findings described in Chapter Two. In both studies, participants self-identified as straight. The primary aim of Study 2 was to conduct a direct replication of the response time effects found in Study 1. Concurrent with Study 1, the results of Study 2 found that greater amounts of SO ambivalence resulted in more time spent deliberating direct questions on sexuality, implying systematic processing. Like Study 1, this main effect was qualified by the same interaction between the amount and the direction of SO ambivalence. The aim of Study 3 was to replicate the observed effects using an alternative measure of systematic processing (thought listing). Here, participants read an editorial on the introduction of gay marriage that was framed as either relevant or non-relevant to SO. Among participants who read SO-relevant information, generated thoughts yielded a pattern of results identical to the reading time measure of processing. This provided additional evidence that the reading time findings described in this thesis reflect differences in the processing of SO-relevant information. Study 3 also extended these findings by investigating the moderating influence of anti-gay attitudes on information processing.

Introduction

In Study 1 two key findings were described. First, greater amounts of explicit-implicit SO ambivalence resulted in more time spent reading and responding to questions that directly measured same- and opposite-sex

attraction and behaviour. Second, there was an interaction between the amount and the direction of SO ambivalence on the time taken to read and respond to questions on same- and opposite-sex attraction and behaviour. Among individuals who reported being less straight on the explicit measure of SO relative to their score on the implicit measure, there was more systematic processing of SO-relevant information when the amount of ambivalence was high. On the other hand, among those who reported being more straight on the explicit measure of SO relative to their score on the implicit measure, systematic processing of SO-relevant information was found among those with both high *and* low amounts of SO ambivalence. Relative to past work on explicit-implicit attitudinal ambivalence (Briñol et al., 2006), this interaction represents a novel effect. As such, a primary aim of Study 2 was to investigate the robustness of these findings by replicating the results. On the basis of the findings from Study 1, in Study 2 there were two hypotheses:

Hypothesis 3.1 To the extent that the findings in Study 1 are robust, it is hypothesised that there will be a main effect of the amount SO ambivalence on processing.

Hypothesis 3.2 To the extent that the findings in Study 1 are robust, it is hypothesised that there will be an interaction between the amount and the direction of SO ambivalence on processing.

STUDY 2

Method

Participants

Fifty-eight straight-identified female Cardiff University students participated for course credit ($M_{age} = 20.23$ years, $SD = 2.31$ years). The sample size is appropriate given the number of predictor variables used in this study (Gpower; Faul et al., 2007). For an analysis of three predictors (the maximum number in this study), Gpower recommends a sample of approximately 60 participants to achieve a moderate effect size.

Materials

Sexual orientation and SO ambivalence. The explicit and implicit measures of SO were outlined in Chapter Two. The explicit measure of SO assessed aspects of opposite- and same-sex attraction and behaviour ($\alpha = .69$). The implicit measure of SO was found to be reliable (adjusted $r(56) = .68$). As described in Chapter Two, SO ambivalence was conceptualized in terms of individual differences in the amount of explicit-implicit discrepancy (the absolute difference between the standardized scores on the explicit and implicit measures of SO) and the direction of the discrepancy (dummy code of +1 or -1 according to the valence of the non-absolute difference between the standardized scores on the explicit and implicit measures of SO).

Reading of explicit questions on sexual orientation. As in the previous study, the mean amount of time it took a participant to read and respond to all questions on the explicit measure of SO was used to assess processing. The time was calculated from the moment an item appeared on the screen to when a participant responded to the item ($M = 2650.36\text{ms}$, $SD = 892.46$).

Procedure

The study was conducted using DirectRT (Jarvis, 2008). Participants completed the explicit measure of SO prior to completing the implicit measure of SO.

Results

Descriptive statistics

Sexual orientation measures. As would be expected among self-reported straight females, the explicit measure of SO showed a significantly stronger preference for men ($M = 8.60, SD = .57$) over women ($M = 1.60, SD = .69$; $t(57) = 52.87, p < .0001$). The implicit measure of SO showed an IAT effect indicative of a straight SO ($MD' = .66, SD = .41$). This value was significantly different from zero ($t(57) = 12.06, p < .0001$), indicating that the test measured a difference in valence between the critical blocks.

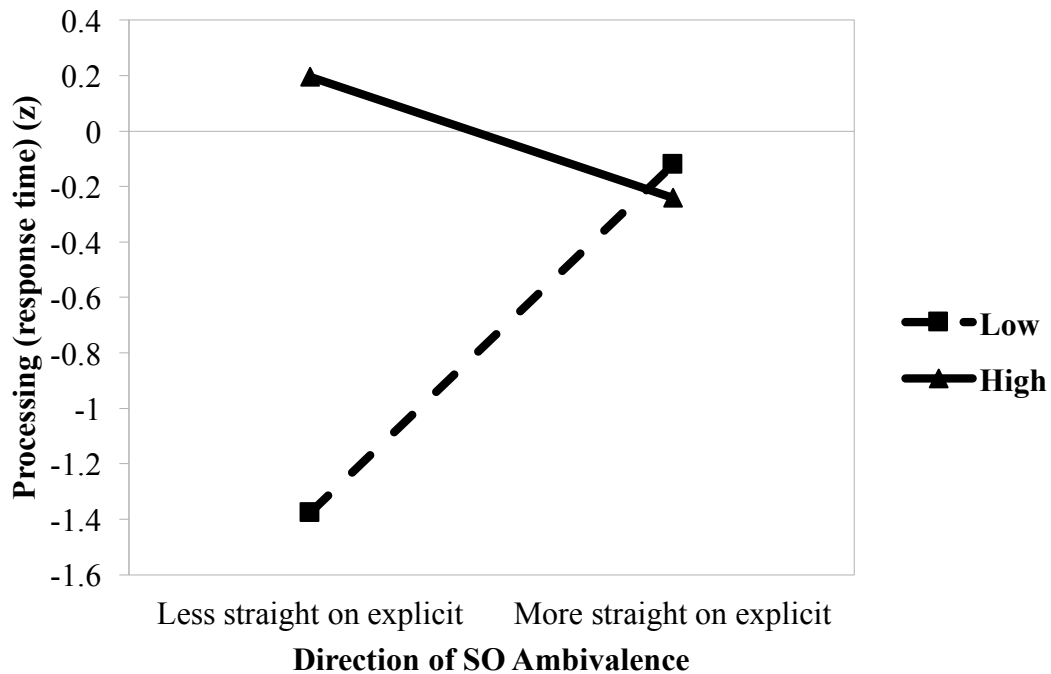
The correlation between the explicit and implicit measures of SO was not significant, $r(56) = .06, ns$.

Feeling torn about one's sexuality: Consequences of explicit-implicit SO ambivalence for information processing

In a regression model the amount and the direction of ambivalence and their interaction were used as the independent variables. The dependent variable was the mean response time of all items on the explicit measure of SO. Replicating Study 1, and in support of hypothesis 3.1, the analysis revealed a significant main effect of the amount of SO ambivalence, $\beta = .31, t(54) = 2.73, p = .01$. Overall, greater ambivalence was associated with more time spent reading and responding to questions on sexuality.

Convergent with Study 1, and in support of hypothesis 3.2, the main effect was qualified by a significant amount by direction interaction, $\beta = -.58$, $t(54) = -3.18$, $p = .002$ (see Figure 3.1). The interaction showed a clear distinction between self-identified straight individuals with low and high amounts of ambivalence *only* when individuals reported being less straight on the explicit measure of SO relative to their score on the implicit measure. In this directional context, those with greater SO ambivalence spent more time reading and responding to questions on sexuality, implying systematic processing, $\beta = .79$, $t(54) = 5.07$, $p < .0001$, $d = 1.38$. However, among individuals who were more straight on the explicit measure of SO relative to their score on the implicit measure, there was no observable difference in the time spent reading and responding to questions on sexuality, $\beta = -.06$, $t < 1$. As such, in this directional context, individuals with *both* high and low amounts of SO ambivalence engaged in systematic processing of SO-relevant information.

Figure 3.1 The impact of the amount (separate lines) and the direction (x-axis) of explicit-implicit SO ambivalence on information processing (response time measure).



Discussion

The primary objective of Study 2 was to investigate the robustness of the information processing effects observed in Study 1. This was accomplished by conducting a direct replication. The results of Study 2 were found to perfectly converge with those described in Study 1. First, there was a main effect of the amount of explicit-implicit SO ambivalence on the time taken to read and respond to explicit questions on sexual attraction and behaviour. Consistent with extant research that has investigated the effects of explicit-implicit attitudinal ambivalence (Briñol et al., 2006), individuals with greater ambivalence engaged in deeper, systematic processing of ambivalence-relevant information.

Second, this main effect was qualified by an interaction between the amount and direction of SO ambivalence. Among individuals who reported being

less straight on the explicit measure of SO relative to their score on the implicit measure, more time was taken to read and respond to explicit questions on sexual attraction and behaviour when the amount of ambivalence was high. On the other hand, among individuals who reported being more straight on the explicit measure of SO relative to their score on the implicit measure, reading time was comparable between those with both high and low amounts of SO ambivalence. Replicating Study 1, this implies that individuals with high and low amounts of ambivalence in this directional context engaged in deeper, systematic processing of relevant information.

While Studies 1 and 2 strongly suggest that individual differences in *both* the amount and the direction of ambivalence are important for understanding the effects of SO ambivalence, the amount of time taken to read and respond to direct questions on same- and opposite-sex attraction and behaviour is not an unambiguous measure of systematic processing. Despite evidence demonstrating an association between reading time and systematic information processing (Chaiken, 1980; Edwards & Smith, 1996; Pratkanis & Greenwald, 1993), there are potential alternative explanations for the present findings.

For example, research has highlighted that slower response time to attitude relevant questions might be a product of *response competition* (see Fazio, 2001). The general idea is that when individuals are presented with something that acts as a prime (e.g., questions on sexual orientation), activated evaluations promote a particular response. In the context of attitudinal ambivalence, competition occurs between conflicting evaluations, resulting in slower response times as a result of needing to use additional cognitive resources to suppress competing responses (Bargh, Chaiken, Govender, & Pratto,

1992). When applied to the present research, as opposed to representing greater amounts of systematic processing, longer response times to questions relevant to sexual orientation could reflect competition between different and competing aspects of sexual orientation.

In a similar vein, van Harreveld, van der Pligt, de Vries, Wenneher, and Verhue (2004) measured attitudes towards genetically modified food using a number of semantic differentiation scales (e.g., bad-good, negative-positive). Subsequently, participants were presented with a list of 14 statements (e.g., disrupts the ecological balance, increases world food production), and participants indicated whether they thought each statement was or was not an attribute of genetically modified food. In three independent samples, it was found that greater amounts of ambivalence were associated with more time completing attitude-relevant questions. However, the same was not found for attribute judgements. As such, the results were interpreted to be a product of individuals needing more time to consider a range of conflicting attitudinal attributes in the context of ambivalence. When applied to the present research, it is conceivable that reading time could be a product of individuals taking more time to consider conflicting aspects of sexuality as opposed to the depth of processing.

In addition, another limitation of the response time measure of processing is the degree of overlap between the independent and dependent measures. In particular, the explicit measure of SO is used to derive a participant's self-reported same- and opposite-sex attraction and behaviour (i.e., the independent variable), and the amount of time required to respond to direct questions on sexual attraction and behaviour (i.e., the independent variable). As

such, in order to rule out these issues, it is necessary to conduct a study that uses a different measure of information processing.

STUDY 3

The results of Studies 1 and 2 provided important insights on the consequences of explicit-implicit SO ambivalence for information processing. Consistent with past research (Briñol et al., 2006), greater explicit-implicit ambivalence was associated with more systematic processing. However, both studies also revealed an interaction between the amount and the direction of SO ambivalence. In light of the issues highlighted above, the aim of Study 3 is to test the generality of these effects using an alternative measure of systematic processing. In addition, this study builds on Studies 1 and 2 by examining the role of anti-gay attitudes (on both the impact of SO ambivalence on anti-gay attitudes and the moderating role of anti-gay attitudes on processing). The paradigm used to assess processing in addition to the rationale for measuring anti-gay attitudes will now be outlined.

An alternative measure of systematic processing – the thought listing technique

In Studies 1 and 2, response time to explicit questions on sexuality was used to quantify the extent of issue-relevant thought. Study 3 used an alternative measure of information processing. The *thought listing* technique asks individuals to write thoughts that come to mind after reading information on a particular topic (e.g., Cacioppo, Glass, & Merluzzi, 1979; Cacioppo, von Hippel, & Ernst, 1997). The paradigm is a measure of elaboration, namely, the number of thoughts listed demonstrates the degree of issue relevant thought (e.g., Edwards & Smith, 1996; Petty & Cacioppo, 1979; see Petty, Haugtvedt, & Smith, 1995 for

an overview). Evidence will now be considered showing that thought listing corresponds to the degree of issue relevant thought, and hence information processing, making this an ideal measure to corroborate the response time measure of processing.

The Elaboration Likelihood Model (Petty & Cacioppo, 1986) implies that the attitude strength is determined by the amount of issue-relevant thought. Proponents of this model have shown that issue relevant thought can be manipulated by increasing the *personal relevancy* of the information (e.g., Petty & Cacioppo, 1979). As such, to the extent that thought listing represents a measure of elaboration, individuals should write more when the information at hand is personally significant. In one example, Edwards and Smith (1996) presented participants with a number of arguments upon which they had strong prior beliefs. Some of the arguments were manipulated such that they were *contrary* to prior beliefs. Because these arguments questioned participants' strong prior beliefs, they were of greater personal relevance when compared to other arguments that did not question their beliefs. The study found that when participants listed thoughts after reading the arguments, more thoughts were generated in response to arguments that questioned prior personal beliefs. Interestingly, the study found the same pattern of findings when considering the amount of time it took participants to read the arguments (i.e., more time for arguments running counter to beliefs). As such, not only does this study demonstrate the utility of thought listing when it comes to understanding the degree of issue relevant thought, and hence processing, the study also shows correspondence between a robust measure of elaboration and a response time measure of processing.

Similarly, in work specific to ambivalence, research has also found that the number of thoughts generated corresponds to greater processing of information relevant to the domain of the discrepancy being experienced (Jonas et al., 1997; Maio et al., 1996; see Chapter 1).

Other evidence has shown that thought listing can help to resolve ambivalence. Nordgren, van Harreveld, and van der Pligt (2006) asked participants to read an article on the consequences of genetically modified food before measuring their ambivalence towards such foods. Participants were then randomly assigned to conditions that manipulated the opportunity to reduce their ambivalence. Some participants were told to write their thoughts on the issue of genetically modified food (high opportunity to resolve), whereas control participants had no such opportunity. Post task assessment of ambivalence showed the greatest reduction among those who were able to generate their thoughts in response to genetically modified foods. Higher ambivalence was also found to be associated with more one-sided thoughts that tended to be in line with initial attitude. As such, this study demonstrates that thought listing corresponds to biased issue-relevant thought, something that permits the reduction of ambivalence.

To summarise, Study 3 utilises an alternative paradigm of information processing to confirm the robustness of the findings demonstrated in Studies 1 and 2. In the study participants were presented with a commentary on the introduction of gay marriage that was either SO-relevant or not SO-relevant. To measure the depth of processing, participants were then invited to report their thoughts in response to the information that was read. The thought listing approach is an established measure of elaborative thought, in other words, it

assesses the amount of issue relevant thinking (e.g., Cacioppo et al., 1979; Cacioppo et al., 1997; Petty et al., 1995). Individuals are motivated to engage in more elaborative thought when the topic is personally significant (e.g., Petty & Cacioppo, 1979). Importantly, when individuals are asked to report their thoughts on personally significant information, this corresponds to the number of thoughts generated (Edwards & Smith, 1996). The generation of thoughts allows those with ambivalence to reduce their ambivalence – it gives them the opportunity to think carefully about the information at hand, and to generate biased thoughts in an attempt to adopt a unilateral position on the attitude object (Maio et al., 1996; Nordgren et al., 2006). Taken together, this evidence clearly shows that the thought listing procedure is an ideal measure to ascertain whether individual differences in explicit-implicit SO ambivalence impact issue relevant thought. With this in mind, the study makes the following predictions:

Hypothesis 3.3 To the extent that the findings in Studies 1 and 2 reflect differences in the systematic processing of SO-relevant information, a main effect of the amount of SO ambivalence on generated thoughts will be found. This pattern will occur when participants generate thoughts in response to SO-relevant information but not when participants generate thoughts in response to non-SO-relevant information.

Hypothesis 3.4 To the extent that the pattern of findings in Studies 1 and 2 reflect differences in the systematic processing of SO-relevant information, an interaction between the amount and the direction of SO ambivalence on generated thoughts will be found. This pattern will occur

when participants generate thoughts in response to SO-relevant information but not when participants generate thoughts in response to non-SO-relevant information.

The role of anti-gay attitudes

As mentioned in Chapter One, Weinstein et al. (2012) demonstrated that responses on explicit and implicit measures of SO related to self-reported anti-gay attitudes. In four independent samples it was found that when participants reported being straight on the explicit measure of SO, higher levels of anti-gay attitudes were measured when individuals identified as relatively more gay on the implicit measure of SO. This finding was interpreted to be a product of *reaction formation*; Weinstein and colleagues argued that explicitly straight individuals reported anti-gay attitudes because implicit evaluations of sexual identity (“I am gay”) threatened self-reported evaluations (“I am straight”). Self-reported anti-gay attitudes were thus argued to rebuff these negative self-perceptions, reducing the likelihood of self-invalidation.

In terms of the present research, the inclusion of a measure of anti-gay attitudes is important. Specifically, Studies 1 and 2 revealed an interaction between the amount and the direction of SO ambivalence on information processing. One of the most interesting patterns revealed by this interaction was the null difference between those with high and low amounts of SO ambivalence when individuals reported being more straight on the explicit measure of SO relative to their score on the implicit measure. It could be said that responses on the implicit measure of SO among these individuals are *relatively* more gay when compared to explicit responses of SO. As such, parallels can be drawn between this result and the findings of Weinstein et al. (2012). In particular, it is plausible

that the null difference between individuals with high and low amounts of ambivalence in this directional context could be explained by a defensive process, such that these individuals are motivated to process information in the same way because implicit evaluations of SO (“I have some identification with being gay” (relatively speaking)) threaten explicit evaluations of SO (“I am straight”). As such, Study 3 makes the following additional hypothesis:

Hypothesis 3.5 More negative anti-gay attitudes will be found amongst those who report being more straight on the explicit measure of SO relative to their score on the implicit measure of SO.

Method

Participants

One hundred and fifteen self-identified straight females ($M_{age} = 19.12$ years, $SD = 1.57$) participated for course credit. The sample size is appropriate given the number of predictor variables used in this study (Gpower; Faul et al., 2007). For a study of 7 predictors (the maximum in this study), Gpower recommends a sample of approximately 80 participants to achieve a moderate effect size.

Materials

Sexual orientation and SO ambivalence. The explicit and implicit measures of SO were those outlined in Studies 1 and 2. The explicit measure of SO was coded according to opposite-sex ($\alpha = .67$) and same-sex attraction ($\alpha = .55$). The implicit measure of SO orientation was reliable (adjusted $r(113) = .68$). As described in Chapter Two, SO ambivalence was conceptualised in terms of

individual differences in the amount of explicit-implicit discrepancy (the absolute difference between the standardized scores on the explicit and implicit measures of SO) and the direction of the discrepancy (dummy code of +1 or -1 according to the valence of the non-absolute difference between the standardized scores on the explicit and implicit measures of SO).

Processing of explicit questions on sexual orientation. The response time to each question on the explicit measure of SO was used to give an indication of the time spent processing aspects of sexual orientation ($M = 2791.89\text{ms}$, $SD = 930.77$).

Manipulation of topic relevance. To determine the effect of individual differences in the amount and the direction of SO ambivalence on processing, two editorials about gay marriage were created that varied in relevance to the domain of SO (see Appendix 8 for full details). This topic was chosen because at the time of data collection, this was a prominent issue that received much public attention. Approximately half of the participants ($n = 57$) read an editorial favouring the introduction of gay marriage containing information that was clearly related to SO. Specifically, this editorial referred to the views of a gay rights charity, research that supported the robustness of same-sex families, reduction of sexual stigma, and evidence that stipulated the detrimental psychological effects of denying equality to same-sex couples. The remaining participants read an editorial favouring the introduction of gay marriage containing information that was not related to SO. Specifically, this editorial referred to the views of a registry office spokesperson on marriage waiting list times, anticipated monetary gains for the government, and improved inheritance tax rights. The effects of the manipulation were distinguished by assigning a

dummy code of +1 to the high relevance editorial and a dummy code of -1 to the low relevance editorial.¹⁰

Thought listing. As a measure of information processing, participants reported their thoughts in response to the information they read (there were no set limits in terms of time or thought number). The dependent variable was the level of thought detail, as indicated by the number of written words. While research has often used the total number of thoughts as an indication of processing (e.g., Clark et al., 2008), in the present study this index was too conservative. For instance, among participants who reported three thoughts, the number of words ranged from 12 to 120. As such, the number of words written more closely reflected the extent to which participants elaborated.

Post-message attitude towards the introduction of gay marriage.

Participants were asked “On the basis of the article, how favourable is your attitude towards the introduction of gay marriage?” Participants responded using a nine-point scale (1 = very unfavourable; 9 = very favourable). This measure was included to assess the effect of the manipulation on post-message attitude.

Anti-gay attitude. Participants completed 24 items that assessed anti-gay attitudes (Wright, Adams, & Bernat, 1999; $\alpha = .73$; see Appendix 9). This

¹⁰ The efficacy of the manipulations was initially assessed by asking participants to rate the arguments in terms of strength on scale from 1 (very weak) to 9 (very strong). No difference in strength was found between the two editorials ($t < 1$). This is likely a product of the topic that is being studied. When collecting data for this study, the introduction of gay marriage in the United Kingdom was at the forefront of societal debate. Given the positive attitudes of our participants toward the introduction of same-sex marriage, it is likely that any argument presented for the introduction of gay marriage would be seen as strong and compelling. The findings show the expected differences between participants who read information that is *clearly relevant* to SO versus those who read information that *clearly is not* relevant to SO. As such, I am confident that this underlies the effect of the results.

measure was used based on its utility in past research that investigated the relationship between explicit and implicit measures of SO (Weinstein et al., 2012). Sample items include “Gay people make me nervous,” and “I make derogatory remarks about gay people.” Participants responded to each item using a nine-point scale (1 = strongly disagree; 9 = strongly agree).

Procedure

The study was conducted using DirectRT (Jarvis, 2008). Participants completed the explicit measure of SO prior to completing the implicit measure of SO. Subsequently, participants read information on the introduction of gay marriage prior to reporting their thoughts and attitudes in response to the information read. The measure of anti-gay attitude was completed last.

Results

Descriptive statistics

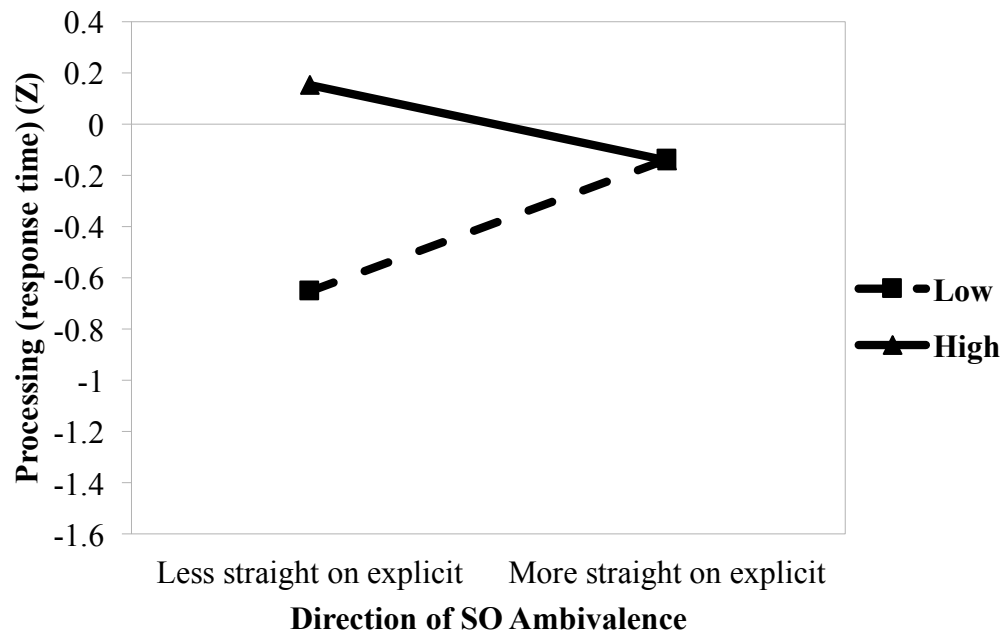
Sexual orientation measures. As would be expected among self-reported straight females, the explicit measure of SO showed a significantly stronger preference for men ($M = 8.66, SD = .67$) over women ($M = 1.70, SD = .82, t(114) = 67.67, p < .0001$). The implicit measure of SO showed an IAT effect indicative of a straight SO ($MD' = .58, SD = .38$). This value was statistically different from zero ($t(114) = 16.44, p < .0001$), indicating that the measure was assessing a difference in valence between the critical blocks.

Within this study, responses on the explicit and implicit measures of SO showed a small positive correlation, $r(113) = .18, p = .05$.

Feeling torn about one's sexuality: Consequences of explicit-implicit SO ambivalence for information processing (response time to direct questions about SO)

In a regression analysis, individual differences in the amount and direction of SO ambivalence, in addition to the respective interaction were included as the independent variables. The dependent variable was the response time measure of processing. Consistent with Studies 1 and 2, greater SO ambivalence was marginally associated with longer deliberation in response to explicit questions about sexuality, $\beta = .17$, $t(111) = 1.80$, $p = .08$. Furthermore, this effect was qualified by a marginally significant amount by direction interaction, $\beta = -.26$, $t(111) = -1.81$, $p = .07$ (see Figure 3.2). The interaction shows a distinction between self-identified straight individuals with low and high amounts of ambivalence *only* when individuals reported being *less straight* on the explicit measure of SO relative to their score on the implicit measure. In this directional context, those with greater SO ambivalence spent significantly more time deliberating their SO relative to those with low amounts of ambivalence, $\beta = .40$, $t(111) = 3.00$, $p = .003$, $d = .57$. However, among individuals who reported being *more straight* on the explicit measure of SO relative to the implicit measure, there was no observable difference as a function of the amount of ambivalence, $\beta = .00$, $t < 1$. Together, these findings replicate those obtained in research described in Studies 1 and 2.

Figure 3.2. The impact of the amount (separate lines) and the direction (x-axis) of explicit-implicit SO ambivalence on information processing (response time measure).



Feeling torn about one's sexuality: Consequences of explicit-implicit SO ambivalence for information processing (elaboration)

In a regression model the amount and the direction of SO ambivalence, information relevance, and the respective interactions were included as the independent variables. The dependent variable was the amount of elaboration in response to the message (as indexed by the number of words). The analysis revealed a significant amount by direction interaction, $\beta = -.39$, $t(107) = -2.68$, $p = .008$. Overall, individual differences in SO ambivalence related to post-message thought elaboration in a pattern identical to that observed with the response time dependent variable of processing.

This effect was qualified by a three-way interaction, $\beta = -.29$, $t(107) = -1.98$, $p = .05$, such that the interaction between the amount and the direction of

SO ambivalence was moderated by the relevancy of the information to sexual orientation. Among participants who read *SO-relevant information*, in line with hypothesis 3.3, there was a marginal main effect of the amount of SO ambivalence on elaboration such that those with greater ambivalence elaborated more, $\beta = .22$, $t(53) = 1.86$, $p = .07$. Unexpectedly, there was also a significant main effect of the direction of SO ambivalence such that those who reported being *more straight* on the explicit measure relative to the implicit measure elaborated more, $\beta = .41$, $t(53) = 2.26$, $p = .03$. In line with hypothesis 3.4, an interaction between the amount and the direction of ambivalence impacted elaboration, $\beta = -.60$, $t(53) = -3.25$, $p = .002$ (see Figure 3.3). As with the response time dependent variable of processing, this interaction revealed two key findings. First, among individuals who reported being *less straight* on the explicit measure of SO relative to their score on the implicit measure, those with greater SO ambivalence elaborated significantly more compared to those with low ambivalence, $\beta = .84$, $t(53) = 3.67$, $p = .001$, $d = 1.01$. Second, among those who reported being *more straight* on the explicit measure of SO relative to their score on the implicit measure, there was no difference in elaboration as a function of the amount of ambivalence, $\beta = -.23$, $t < 1$. These results concur with the reading time dependent variable, providing unequivocal evidence that deliberation about sexuality differs as a function of the amount and direction of SO ambivalence.

When individuals read non-SO-relevant information, there were no significant effects (all $ps > .62$).

Figure 3.3. The impact of the amount (separate lines) and direction (x-axis) of SO ambivalence on elaboration after reading SO-relevant information.

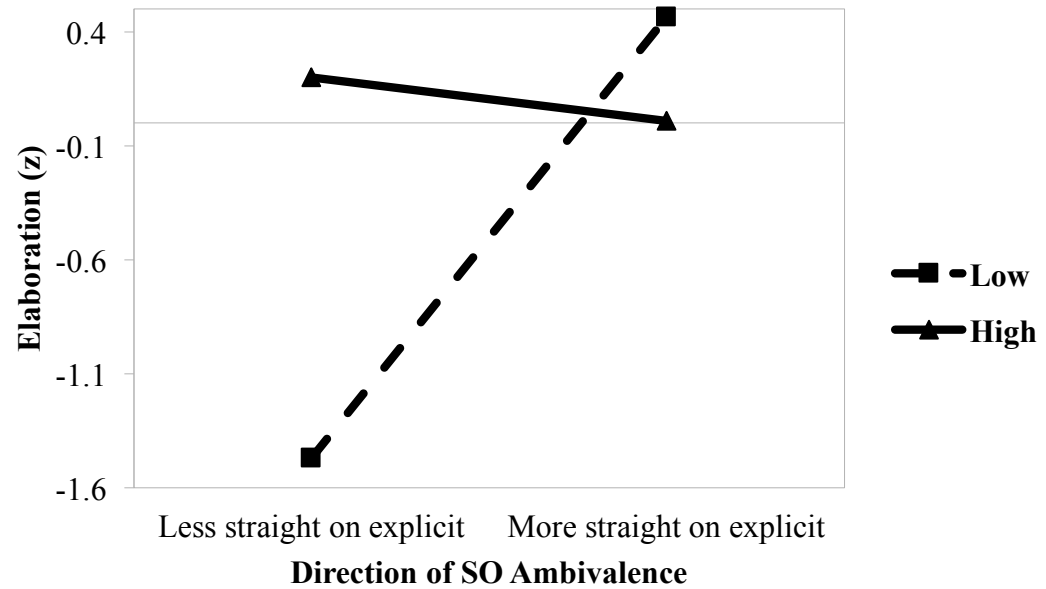


Table 3.1 Summary of standardised regression coefficients (β) and their significance. Columns detail individual differences in SO ambivalence; rows detail dependent measures.

	Amount of SO ambivalence	Direction of SO ambivalence	Amount X Direction
Reading time	.17 ^Δ	.05	-.26 ^Δ
Thought listing, SO relevant information	1.86 ^Δ	.41*	-.60**
Thought listing, non-SO relevant information	.01	.09	-.12

** $p < .01$, * $p < .05$, ^Δ $p < .08$

Feeling torn about one's sexuality: Consequences of explicit-implicit SO ambivalence for post-message attitude on the introduction of gay marriage

In a regression model the amount and the direction of SO ambivalence, information relevance, and the respective interactions were included as the independent variables, with attitude towards gay marriage as the dependent variable ($M = 7.89$; $SD = 1.36$). The analysis revealed a significant main effect of the amount of SO ambivalence, $\beta = .23$, $t(107) = 2.40$, $p = .02$. Overall, greater SO ambivalence was associated with more favourable attitudes towards gay marriage. This main effect was qualified by a significant interaction between the amount of SO ambivalence and information relevance, $\beta = .29$, $t(107) = 2.00$, $p = .05$. This revealed that greater amounts of SO ambivalence resulted in favourable attitudes towards gay marriage after reading SO-relevant information, $\beta = .36$, $t(53) = 2.77$, $p = .01$, $d = .76$. However, ambivalence did not impact attitudes among individuals presented with low relevance information supporting gay marriage, $\beta = .05$, $t(54) < 1$.

Unlike the other outcomes presented in this study, an interaction between the amount and the direction of SO ambivalence on attitude towards the introduction of gay marriage was not found, $\beta = .03$, $t(107) < 1$.

The role of anti-gay attitudes

In a regression analysis, the amount and the direction of SO ambivalence and their respective interaction were included as the independent variables. The dependent variable was anti-gay attitude. The analysis revealed no significant effects (all $ps > .20$). As such, Study 3 did not find support for hypothesis 3.5.

Anti-gay attitudes – a potential moderator of information processing. As an exploratory exercise, in a regression analysis, the amount and

the direction of SO ambivalence, anti-gay attitude, and the respective interactions were included as the independent variables. The dependent variable was the mean reaction time of all items on the explicit measure of SO (response time measure).¹¹ The analysis revealed a significant main effect of anti-gay attitude – overall, individuals with more negative anti-gay attitudes took longer to respond to explicit questions on sexuality, $\beta = .32$, $t(103) = 2.02$, $p = .05$.

Interestingly, this effect was qualified by a three-way interaction, $\beta = -.47$, $t(103) = 2.51$, $p = .01$, such that the interaction between the amount and the direction of ambivalence on processing was moderated by anti-gay attitude. This interaction was explored by breaking it down as a function of the direction of SO ambivalence.¹² Among individuals who reported being *less straight* on the explicit measure of SO relative to their score on the implicit measure, a main effect of the amount of SO ambivalence on processing was found, $\beta = .34$, $t(48) = 2.50$, $p = .02$. However, in this directional context anti-gay attitude ($\beta = .05$, $t(48) < 1$) and the respective interaction ($\beta = -.03$, $t(48) < 1$) were unrelated to the response time measure of processing. As such in this directional context, anti-gay attitudes did not moderate processing.

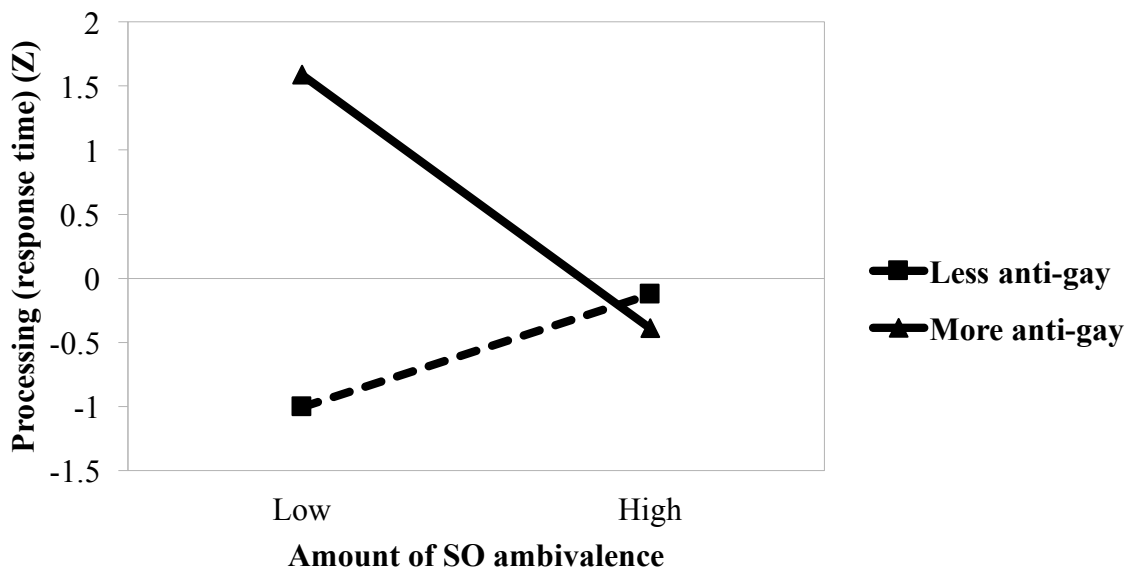
Among individuals who reported being *more straight* on the explicit measure of SO relative to their score on the implicit measure, a main effect of anti-gay attitude on processing was found, $\beta = .57$, $t(55) = 2.66$, $p = .01$ – in this directional context, anti-gay attitudes were associated with taking longer to complete explicit questions on sexuality. This main effect was found to be

¹¹ It was not possible to perform the analysis on the thought listing dependent variable – an analysis with four independent variables (each with two levels) would be underpowered given the number of cases.

¹² Hypothesis 3.5 predicted different effects as the function of the direction of SO ambivalence, explaining this chosen analytical approach.

qualified by a significant interaction between anti-gay attitude and the amount of SO ambivalence, $\beta = -.75$, $t(55) = -3.21$, $p = .002$ (see Figure 3.4). This pattern revealed two key effects. First, among those with high amounts of SO ambivalence, homophobic attitudes were not found to moderate processing, $\beta = -.13$, $t(55) < 1$. Second, among those with low amounts of SO ambivalence, individuals with more negative anti-gay attitudes engaged in significantly deeper processing than those with less negative anti-gay attitudes, $\beta = 1.29$, $t(55) = 3.09$, $p = .003$, $d = .83$. Interestingly, when individuals with low amounts of ambivalence (in this directional context) had low anti-gay attitudes, SO-relevant information was processed in ways that would be expected among those with low amounts of ambivalence. In other words, individuals with low amounts of ambivalence engaged in less processing than those with high amounts of SO ambivalence, $\beta = .44$, $t(55) = 1.88$, $p = .06$, $d = .51$.

Figure 3.4 The impact of anti-gay attitude (separate lines) and amount of SO ambivalence (x-axis) on the response time measure of processing individuals who report being more straight on the explicit measure of SO relative to their score on the implicit measure.



Discussion

The research described in Study 3 had two objectives. First, given the potential limitations of the response time measure of processing used in the preceding studies, this study sought to replicate the effects using an alternative measure of processing. Second, past research has demonstrated that responses on explicit and implicit measures of SO are moderated by self-reported anti-gay attitudes (Weinstein et al., 2012). As such, this research also sought to establish whether explicit-implicit SO ambivalence related to self-reported anti-gay attitudes. These two objectives will now be discussed in turn.

SO ambivalence and systematic information processing

Overall, the amount of elaboration elicited a pattern that was consistent with the response time measure. Importantly, this effect was moderated by

information relevancy. Specifically, among participants who read information on the introduction of gay marriage that was relevant to SO, the findings on the elaboration measure of processing yielded effects that converged with the response time measure. When participants read information on the introduction of gay marriage that was not relevant to SO, there was no association between ambivalence and elaboration. This provides direct and convergent evidence that the response time findings in the preceding studies reflect differences in the deliberation of SO-relevant information, confirming the robustness of the effects reported earlier in this thesis.

In support of hypothesis 3.3, high amounts of ambivalence resulted in more elaboration when individuals read information on gay marriage that was relevant to SO. As such, those with high amounts of SO ambivalence engaged in more issue relevant thought. The study also found an unexpected main effect of the direction of SO ambivalence on elaboration such that those who reported being more straight on the explicit measure of SO relative to their response on the implicit measure engaged in more issue relevant thought. Importantly, and in support of hypothesis 3.4, these main effects were qualified by a significant interaction between the amount and the direction of SO ambivalence. As with the response time measure of processing, the interaction revealed two key findings. First, among those who reported being less straight on the explicit measure of SO relative to the implicit measure, individuals with greater amounts of ambivalence elaborated more than those with low ambivalence. Second, among those who reported being more straight on the explicit measure of SO relative to the implicit measure, individuals with high *and* low amounts of SO ambivalence generated equally high elaboration.

The role of anti-gay attitudes

In the introduction to this study, the findings of Weinstein et al. (2012) were described showing that responses on explicit and implicit measures of SO were related to self-reported anti-gay attitudes. When individuals reported being straight on an explicit measure of SO, high levels of anti-gay attitudes were measured when the individuals also identified as relatively more gay on an implicit measure of SO. This finding was explained to be indicative of reaction formation. Clear parallels can be drawn between this research and the novel interactive effects found in Studies 1-3. Specifically, among those who reported being more straight on the explicit measure of SO relative to the implicit measure, the null difference between those with high and low amounts of ambivalence could be a consequence of a defensive process.

To investigate this possibility, in the present study self-reported anti-gay attitudes were measured to investigate the association with SO ambivalence. While a direct link between SO ambivalence and anti-gay attitudes was not found, for those who reported being more straight on the explicit measure of SO relative to the implicit measure, anti-gay attitudes influenced response times to questions on sexuality. In particular, among those with low ambivalence (in this directional context), those with anti-gay attitudes took longer to complete the explicit questions on sexuality, implying deeper processing. Future research should further investigate whether defensiveness (i.e., anti-gay attitudes) is a key motivator of systematic processing for some people who experience SO ambivalence. Such research would be necessary before any firm conclusions on this could be made, for instance, it could be possible that the findings could be a consequence of the measure of anti-gay attitudes being completed last.

CHAPTER FOUR:
SEXUAL ORIENTATION AMBIVALENCE, INFORMATION PROCESSING AND
WELL-BEING IN *GAY-IDENTIFIED* INDIVIDUALS – SOME INITIAL INSIGHTS

Overview of Chapter

The research in the previous chapters examined implications of SO ambivalence among *self-identified straight individuals*. In this and the subsequent chapter, the research examines the effects of SO ambivalence in samples of *gay-identified individuals*. In this chapter, Study 4 had three predominate aims. The first was to investigate the impact of SO ambivalence on information processing. The second was to investigate the impact of SO ambivalence on psychological well-being. On the basis of a large body of evidence showing poor mental health among gay-identified individuals, a third aim was to investigate implications associated with explicit and implicit (positive/negative) *evaluations* of sexual orientation.

Among gay-identified individuals, Study 4 revealed that the amount and direction of SO ambivalence moderated processing, but in ways different to that observed in straight-identified participants. Further, SO ambivalence was found to be associated with self-esteem and negative implicitly measured evaluations of SO. Discrepant explicit-implicit evaluations of SO were related to discrepant responses on explicit and implicit measures of self-esteem.

Introduction

Study 4 provides an initial exploration on the effects of SO ambivalence on information processing and aspects of psychological health among self-identified gay participants. The work extends that described in Chapter Two (Study 1) where implications of SO ambivalence for information processing (the amount of

time spent completing explicit questions on sexuality), well-being (self-esteem, life satisfaction, happiness), emotional regulation (reappraisal, suppression, rumination), and self-identity were examined among self-identified straight participants. It is possible that the associations among SO ambivalence, information processing, and psychological health might be different relative to those observed among straight-identified individuals. Owing to widespread anti-gay discrimination (e.g., Herek & Garnets, 2013), when it comes to their SO, the experience of gay-identified individuals is likely to be *very* different when compared to that of straight-identified individuals. This experience, coupled with the novel effects of SO ambivalence identified in the previous chapters, makes it difficult to form a priori hypotheses in the present research on the basis of that described in the previous chapters.

The Association Between Sexual Orientation and Well-Being in Gay-Identified Individuals

This section summarises research detailing the association between sexual orientation and psychological well-being among gay-identified individuals. On the basis of this evidence, the section comes to a rationale for the development and inclusion of explicit and implicit measures designed to assess *evaluations* of one's SO in this component of the thesis.

Much research has found that gay-identified individuals (both males and females) are more likely to experience mental health problems. For example, King et al. (2003) examined the mental health and quality of life in samples of gay men, gay women, straight men, and straight women. When compared to straight-identified men, gay men were found to have higher levels of psychological distress (e.g., reported higher levels of irritability, generalised

anxiety, obsessional thoughts, and worse general health). This pattern of results was similarly found when gay-identified females were compared to straight-identified females. In addition, 25% of gay males and 33% of gay females reported self-harm, with many explaining their SO to be the sole motive. In a more recent UK population survey, Chakraborty, McManus, Brugha, Bebbington, and King (2011) investigated the prevalence of mental disorders, self-harm and suicide attempts among LGB individuals.¹³ Within this sample there was higher prevalence of neurotic disorders, depression, generalised anxiety disorder, obsessive-compulsive disorder, phobic disorder, suicidal thoughts and acts, and self-harm among LGB individuals compared to straight individuals.

The higher prevalence of mental health problems among gay-identified individuals is not confined to the United Kingdom. A number of reviews and meta-analyses have confirmed this pattern of findings to occur in other Western Countries, including Australia, Canada, the Netherlands, New Zealand, Norway, and the USA (see Haas et al., 2011; King et al., 2008). That said, on a more positive note, some research has found the mental health of gay individuals to be comparable to that of straight-identified individuals. For instance, Bybee, Sullivan, Zielonka, and Moes (2009) measured indices of mental health (including depression, suicidality, anger, anxiety, self-esteem, etc.) in samples of gay and straight men aged 18-48 years. It was found that gay-identified men from their mid-twenties onwards experienced similar mental health outcomes relative to straight-identified males of the same age. On the basis of this, it is

¹³ LGB – samples that include lesbian, gay, and bisexual individuals. In these studies, authors often report data from these three sexual identity groups in conjunction.

plausible that outcomes of mental health in gay-identified individuals are moderated by a third variable.

As such, instead of addressing the prevalence of mental health in samples of gay-identified individuals generally, other research has studied specific contextual variables that make mental health problems more likely. In one particular vein, researchers have studied whether gay-identified individuals are more likely to experience *stressful life events* as a consequence of minority group membership (Burton, Marshal, Chisolm, Sucato, & Friedman, 2013; Hatzenbuehler et al., 2009; Hatzenbuehler, Keyes, & McLaughlin, 2011; Herek & Garnets, 2007; Meyer, 2003). For instance, in Meyer's (2003) *minority stress* model it is argued that, on account of societal stigma, prejudice, and discrimination, gay-identified individuals experience a number of unique stressors that increase the likelihood of chronic health problems.

One particular stressor that has received much attention in the literature is the concealment of SO (e.g., Frost et al., 2007; Gattis et al., 2012; Ullrich et al., 2003). Concealment of SO requires self-control, namely, the constant monitoring of one's behavioural responses such that they are in line with ideals, values, morals, and social expectations (see Baumeister, Vohs, & Tice, 2007). For example, Meyer (2003) proposed that gay-identified individuals have heightened vigilance when interacting with others, and in certain social situations conceal SO entirely. Understandably, the constant monitoring of one's behavioural responses results in negative effects such as cognitive exhaustion. In one experimental example, Critcher and Ferguson (2014) investigated the effect of concealing sexual orientation on cognitive resources. In this study, participants were instructed to conceal their sexual orientation in an interview. In this

interview, participants were asked a series of questions such as, “What is most different between your life at [this university] and your life before you came to [this university]” and “what sort of activities do you like to do on a first date?” Among participants instructed to conceal their SO, the second question demanded greater cognitive resources (e.g., not revealing the gender of their date and instead saying something along the lines of “my significant other”). After the interview participants completed a task designed to assess cognitive depletion – a 12-minute, 24-item block counting task designed to assess spatial intelligence. Interestingly, participants instructed to conceal their SO completed significantly fewer block items, indicating that concealment of SO resulted in a depletion of cognitive resources.

Factors that result in stress (such as the concealment of SO) also implicate negative psychological health outcomes among gay-identified individuals. For example, Hatzenbuehler et al. (2011) investigated whether living in US States with higher or lower concentrations of same-sex couples moderated the development of mood and anxiety disorders in the context of stressful life events (e.g., low socio-economic status). The study found that when gay-identified individuals experienced financial difficulties (a stressor unspecific to minority group status), there was increased risk for mood and anxiety disorders *only* when individuals lived in states with lower concentrations of same-sex couples. In a similar manner, Legate et al. (2011), in a sample of LGB individuals, measured experiences of autonomy control (restrictive self-expression – minority stress) and autonomy support (unrestrictive self-expression – no minority stress) in a number of social contexts (e.g., family life, friends, co-workers). Participants were also asked to indicate how “out” they were in the

different social contexts, and indices of well-being (self-esteem, depression, and anger) were measured. The study found that disclosure of SO in autonomy *supportive* contexts was associated with *positive* psychological well-being. However, disclosure in autonomy *controlling* social contexts was not associated with psychological well-being. As such, when individuals are exposed to social environments (fewer gay-identified couples; restricted self-expression) that have the potential to increase minority stress (e.g., vigilance when interacting with others, SO concealment etc.), negative psychological outcomes are more likely.

What are the wider impacts of minority stress among gay-identified individuals? Some researchers have argued that minority stress results in negative evaluations of SO in the form of *internalised homophobia*. In one example, Hatzenbuehler et al. (2009) measured responses on explicit and implicit measures of internalised homophobia (negative attitudes towards being gay) in a sample of LGB individuals. The explicit measure of internalised homophobia included items such as “Have you ever felt that being gay, lesbian, or bisexual is a personal shortcoming?” The implicit measure of internalised homophobia was an IAT designed to assess the strength of the automatic association between images of gay couples and positive/negative words (e.g., love, cheer, evil, hate). The study found that, among those with greater internalised homophobia on the implicit measure, there were higher levels of negative psychological outcomes including emotional regulation (rumination, suppression) and general psychological distress. In other words, when gay-identified individuals experience minority stress they negatively evaluate their sexual orientation.

To summarise, the aforementioned research shows greater prevalence of mental health problems among gay-identified individuals (Chakraborty et al., 2011; Haas et al., 2011; King et al., 2003; 2008). Some have interpreted these findings to be a consequence of stress that is experienced in connection with minority group membership (Hatzenbuehler, et al., 2009; Hatzenbuehler et al., 2011; Herek & Garnets, 2007; Meyer, 2003). The experience of minority stress can result in negative evaluations of one's SO in the form of internalised homophobia, something that also has negative consequences of psychological health (Hatzenbuehler et al., 2009). This research provides clear a rationale for the inclusion of (explicit and implicit) measures designed to assess (positive/negative) *evaluations* of one's SO in the following research studies – the inclusion of such measures provides greater detail when trying to ascertain the feelings that gay-identified individuals have towards their SO.

STUDY 4

The research in Study 4 had three predominate aims. The first was to investigate implications of SO ambivalence for information processing. The second was to investigate implications of SO ambivalence for psychological health including measures of well-being, emotional regulation, and self-identity. A final aim was to investigate implications associated with explicit and implicit (positive/negative) evaluations of sexual orientation for the same outcomes of psychological health.

Method

Participants

Forty-eight gay-identified participants (12 females; $M_{age} = 31.65$ years, $SD = 12.38$) participated for £5. Participants were recruited via LGBT social groups and staff networks in South Wales and the South West and South East of England. Participants were also recruited via a snowballing method. The sample size is less than that recommended for a study with three predictor variables (60 participants; Faul et al., 2007). The gender composition of the study is also unbalanced. These limitations reflect the difficulty of recruiting gay-identified individuals for this research. The low number of females made it inappropriate to consider gender as an independent variable.

Materials

Sexual Orientation and Information Processing Measures

Sexual orientation and SO ambivalence. The explicit and implicit measures of SO were those outlined in the preceding studies. As noted in Chapter 2, there were separate versions of this test for female and male participants. Ambivalence was conceptualized in terms of individual differences in the amount of explicit-implicit discrepancy (the absolute difference between the standardized scores on the explicit and implicit measures of SO) and the direction of the discrepancy (dummy code of +1 or -1 according to the valence of the non-absolute difference between the standardized scores on the explicit and implicit measures of SO).

Processing of explicit questions on sexual orientation. The response time to each question on the explicit measure of SO was used to provide an

indication of the time spent processing aspects of sexual orientation ($M = 3135.81\text{ms}$, $SD = 1188.84$).

Measures of Well-Being

Measures of self-esteem. The study used the single-item explicit (ESE; Robins et al., 2001) and implicit (ISE; Gebauer et al., 2008) measures described in Study 1.

Life satisfaction. As described in Study 1, five items were used to measure global cognitive judgements of life satisfaction (Diener et al., 1985; $\alpha = .82$).

Happiness. As described in Study 1, four items were used to measure global subjective happiness (Lyubomirsky & Lepper, 1999; $\alpha = .60$).

Measures of Emotion Regulation

Reappraisal and suppression. As described in Study 1, the emotion regulation questionnaire was used to assess individual tendencies of reappraisal and suppression (Gross & John, 2003). Six items assess reappraisal ($\alpha = .84$), and a further four items assess suppression ($\alpha = .74$).

Rumination. As described in Study 1, ten items were used to assess self-focused attention (Treynor et al., 2003; $\alpha = .83$).

Measures of Self-Identity

This study used the three measures of self-identity described in Study 1, however, these items were semantically modified to reflect a gay orientation. Seven items measured the extent to which participants perceived their SO to be a part of the self (the centrality component; $\alpha = .74$). Five items measured positive and negative feelings participants felt towards their SO (the affect component; α

= .85). A final six items measured perceived similarities and commonalities with other gay individuals (the ties component; $\alpha = .86$).

Evaluation of One's SO

Explicit measure. This measure was the affect component of the measure of self-identity.¹⁴

Implicit measure. This measure has procedural similarities to that used in past research to assess implicit self-stigma/internalised homophobia (e.g., Hatzenbuehler et al., 2009). However, in keeping with the implicit measure of SO, the *SO-evaluation* IAT was also personalised. The measure assessed the strength of the automatic association between an individual's SO and positive/negative evaluation words (for a full account on the stimuli used, see Appendix 10). Like the implicit measure of SO, Block One (10 trials) and Two (10 trials) were simple categorization tasks. In Block One, participants classified pictures that were representative of their sexual orientation or not representative of their sexual orientation. The pictures, taken from publicly available sources, were pictures of straight or gay couples, and were different to those used in the implicit measure of SO. The pictures presented were dependent on participant gender – males saw images of male-gay couples, females saw images of female-gay couples. All participants saw the same images of straight couples. In Block Two, participants classified words as either “positive” (e.g., happiness, warmth) or “negative” (e.g., corpse, vomit). In Block Three (20 trials), both pictures and words were presented. Participants responded via a button press that corresponded to “My

¹⁴ The items on the affect facet have semantic similarities to measures used in past research to assess self-stigma/internalised homophobia (e.g., Hatzenbuehler et al., 2009). For example, the measure used by Hatzenbuehler et al. (2009) included items such as, “you have felt that being gay, lesbian, or bisexual is a personal shortcoming,” and “you have wished you weren't gay, lesbian or bisexual.” Participants responded using a scale from 0 (=never) to 3 (=often).

sexual orientation or positive,” and another button press that corresponded to “Not my sexual orientation or negative.” Block Four (10 trials) repeated Stage One, however the category labels were presented on the opposite side of the screen. Block Five (20 trials) was similar to Stage Three, however one button press now corresponded to “My sexual orientation or negative,” and another button press corresponded to “Not my sexual orientation or positive.” Split-half reliability analyses indicated acceptable reliability (adjusted $r = .65$).

Assessing the Effects of Discrepant Responses on Explicit and Implicit Measures of Evaluation of One’s SO

As an exploratory exercise this study investigated the consequences of ambivalence between responses on explicit and implicit measures of evaluation of one’s SO. This was done by examining the discrepancy between scores on the affect component of the self-identity measure and the implicit measure of evaluation of one’s SO. Explicit-implicit ambivalence was calculated in the same way as explicit-implicit SO ambivalence. Namely, parameters were calculated to quantify the amount and the direction of ambivalence (for an overview see Table 4.1). Calculating the difference between standardised scores on the explicit and implicit measures derived these values. The *amount* of ambivalence concerns the absolute value of this difference, such that the greater the value from zero, the greater the discrepancy between scores on the explicit and implicit measures. The *direction* of SO ambivalence concerns the relative positivity or negativity of the standardised explicit-implicit (non-absolute) difference. When a negative value was calculated (indicating less positive evaluation on the explicit measure relative to the implicit measure [$E < I$]), a dummy code of -1 was used. When a

positive value was calculated (indicating more positive evaluation on the explicit measure relative to the implicit measure [$E > I$]), a dummy code of +1 was used.

Table 4.1 A table showing the amount (2 levels) and the direction (2 levels) of ambivalence between responses on explicit and implicit measures of evaluation of one's SO

The direction of ambivalence	The amount of ambivalence	
	<i>High</i>	<i>Low</i>
Explicit score < Implicit score ($E < I$)	Less positive evaluation towards SO on the explicit measure relative to the implicit measure, to a large degree.	Less positive evaluation towards SO on the explicit measure relative to the implicit measure, to a small degree.
Explicit score > Implicit score ($E > I$)	More positive evaluation towards SO on the explicit measure relative to the implicit measure, to a large degree.	More positive evaluation towards SO on the explicit measure relative to the implicit measure, to a small degree.

Procedure

The study was conducted using DirectRT (Jarvis, 2008). Participants completed the explicit measure of SO prior to the measures well-being, emotional regulation, and self-identity. The implicit measures of SO and evaluation were completed at the end.

Results

Owing to the number of findings presented in this chapter, the results have been divided into three different sections. The first section presents relevant descriptive statistics and relationships among the measures. At the end

of this section is a correlation table detailing the associations among the measures. The second section focuses on the consequences of explicit-implicit SO ambivalence. The third section focuses on the effects of discrepant responses on explicit and implicit measures of evaluation towards one's SO. For the purpose of succinctness, within the second and third sections only significant results are described in depth. However, at the end of these sections, for convenience, are tables summarising the standardised regression coefficients for each analysis.

Descriptive Statistics and Correlations

Sexual orientation measures

As would be expected, self-identified gay participants were more attracted to same-sex ($M = 8.40, SD = .73$) than opposite-sex individuals ($M = 1.75, SD = .89; t(47) = -39.46, p < .0001$). The implicit measure of SO showed an IAT effect indicative of a gay SO ($MD' = -.77, SD = .33$). This value was statistically different from zero, indicating that the measure was assessing a difference in valence between the critical blocks, $t(47) = -16.39, p < .0001$.

Responses on the explicit and implicit measures of SO were not correlated, $r(46) = -.02, p = .89$.

Evaluation of SO

Explicit measure. Overall, participants had positive evaluations of their SO on the explicit measure ($M = 7.72, SD = 1.50$), as shown by this value being significantly greater than the scale mid-point, $t(47) = 14.90, p < .0001$.

Implicit measure. This measure revealed an IAT effect that was generally indicative of positive evaluations ($MD' = .51, SD = .47$). This value was statistically different from zero, indicating that the measure was assessing a difference in valence between the critical blocks, $t(47) = 7.41, p < .0001$.

Relationships among Measures

Please see Table 4.2 for a summary of correlations. Below I highlight the relationships for the primary variables (these are also shaded in Table 4.2) .

Sexual orientation measures. As can be seen from Table 4.2, the explicit measure of SO did not significantly correlate with any of the variables. However, there was a marginally significant negative association between this measure and centrality scores ($r(46) = -.27, p = .06$) – SO was reported to be more central to the sense of self among those who reported being more gay. The implicit measure did not significantly correlate with any of the variables.

Evaluation of one's SO. The explicit measure was positively associated with happiness ($r(46) = .35, p = .02$) and ties ($r(46) = .35, p = .02$). The implicit measure was positively associated with both centrality ($r(46) = .31, p = .03$) and ties ($r(46) = .31, p = .03$), and unrelated to affect ($r(46) = .05, p = .72$).

Self-esteem. The explicit and implicit measures of self-esteem were positively associated, $r(46) = .32, p = .03$. To examine the effects of discrepant SE, a participant's standardised ISE score was subtracted from their standardised ESE score. This additional variable is coined "ESE-ISE."

Table 4.2 Summary of Correlations, Means, and Standard Deviations

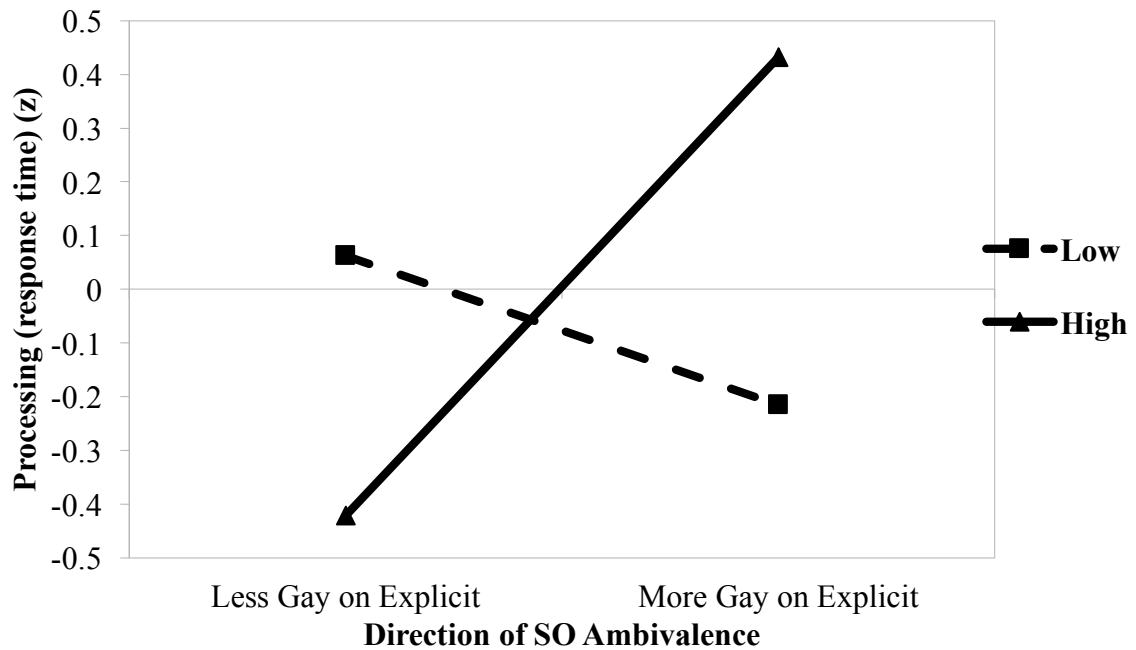
Measure	1	2	3	4	5	6	7	8	9	10	11
1. Explicit SO	_	-.02	.21	-.07	.26	.21	.11	-.15	.08	.20	-.27
2. Implicit SO	-.02	_	-.10	.06	-.14	-.07	-.13	-.14	.05	-.03	.09
3. Explicit self-esteem	.21	-.10	_	.32*	.78**	.39**	.55**	.30*	-.18	-.18	-.29*
4. Implicit self-esteem	-.07	.06	.32*	_	-.35*	.14	.23	.04	-.21	-.50**	-.13
5. ESE-ISE	.26	-.14	.78**	-.35*	_	.29*	.39**	.27	-.03	.16	-.20
6. Life satisfaction	.21	-.07	.39**	.14	.29*	_	.61**	.15	-.13	-.33*	-.27
7. Happiness	.11	-.13	.55**	.23	.39**	.61**	_	.36*	-.29*	-.39**	-.22
8. Reappraisal	-.15	-.14	.30*	.04	.27	.15	.36*	_	.01	-.21	.01
9. Suppression	.08	.05	-.18	-.21	-.03	-.13	-.29*	-.01	_	.17	-.06
10. Rumination	.20	-.03	-.18	-.50**	.16	-.33*	-.39**	-.21	.18	_	.16
11. Centrality	-.27	.09	-.29*	-.13	-.20	-.27	-.22	.01	-.06	.16	_
12. Explicit evaluation of SO	.09	-.07	.23	.21	.09	.25	.35*	-.06	-.23	-.21	-.09
13. Ties	-.14	-.20	.22	.03	.20	.09	.30*	-.04	-.24	-.05	.11
14. Implicit evaluation of SO	-.19	-.10	-.05	-.09	.01	-.18	-.12	.17	-.08	-.10	.31*

The Effects of Explicit-Implicit SO Ambivalence

Information Processing

In a regression model the amount and the direction of ambivalence and their interaction were used as the independent variables. The dependent variable was the mean time taken to respond to all questions on the explicit measure of SO. The analysis revealed a marginally significant interaction between the amount and the direction of SO ambivalence, $\beta = .41$, $t(44) = 1.81$, $p = .08$ (see Figure 4.1). Interestingly, this interaction reveals a pattern of results that is different to those observed in straight-identified individuals. Within this sample of gay-identified individuals, the amount of time spent completing SO-relevant questions did not differ among those with low amounts of SO ambivalence as a function of the direction of SO ambivalence, $\beta = -.14$, $t(44) < 1$. However, the direction of SO ambivalence did produce a significant difference in SO-relevant processing when the amount of SO ambivalence was high. In particular, when the amount of SO ambivalence was high, those who reported being more gay on the explicit measure of SO relative to the implicit measure spent more time processing SO-relevant information than those who reported being less gay on the explicit measure of SO relative to the implicit measure, $\beta = .43$, $t(44) = 3.27$, $p = .002$, $d = .99$

Figure 4.1 The impact of the amount of SO ambivalence (separate lines) and the direction of SO ambivalence (x-axis) on information processing (response time measure).

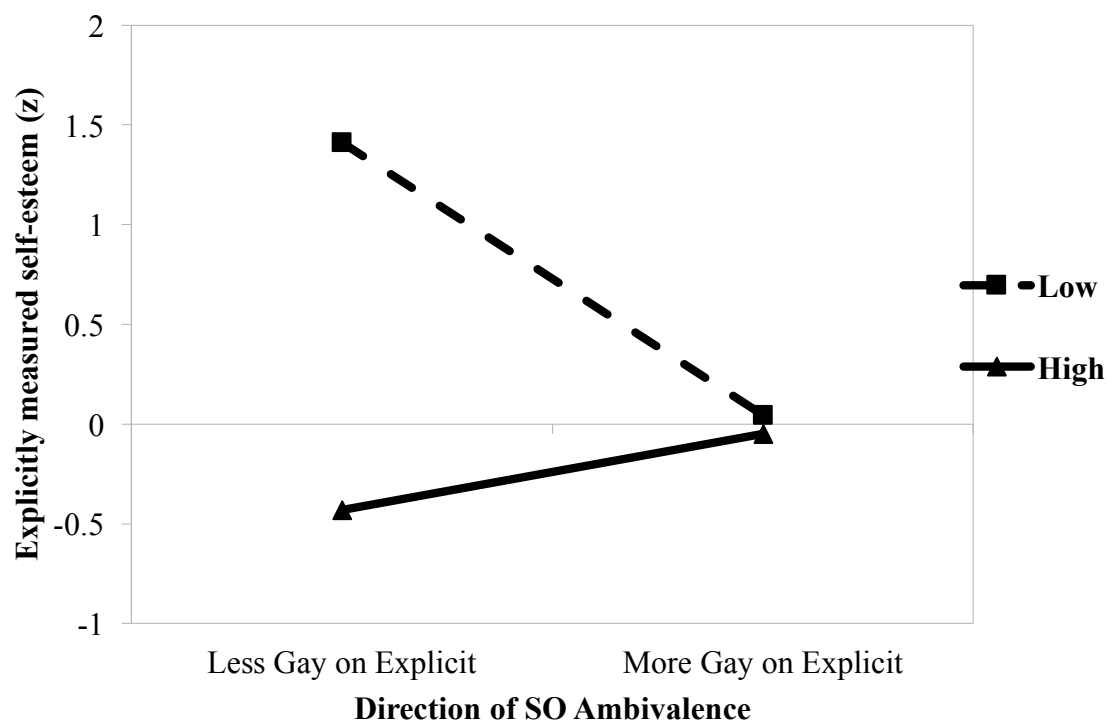


Psychological Well-Being

Explicit measure of self-esteem (ESE). In a regression analysis, individual differences in the amount and the direction of SO ambivalence and the respective interaction were included as the independent variables. ESE score was included as the dependent variable. The analysis revealed a significant interaction, $\beta = .62$, $t(44) = 2.61$, $p = .01$ (see Figure 4.2). This interaction revealed significantly higher ESE among those who reported being less gay on the explicit measure of SO relative to the implicit measure when the amount of SO ambivalence is low. This is found when these individuals are compared to

those with high amounts of ambivalence in the same direction ($\beta = -.68, t(44) = -3.12, p = .003, d = .94$), in addition to those who report being more gay on the explicit measure of SO relative to their score on the implicit measure when ambivalence is low, $\beta = -.92, t(44) = -2.37, p = .02, d = .71$. In essence, individuals low in ambivalence and less gay on the explicit measure reported higher scores on the explicit measure of self-esteem.

Figure 4.2 The impact of the amount of SO ambivalence (separate lines) and the direction of SO ambivalence (x-axis) on explicitly measured self-esteem.



Other measures of well-being. As noted in Table 4.3, individual differences in SO ambivalence were unrelated to implicitly measured self-esteem (all $ps > .13$), ESE-ISE discrepancy (all $ps > .13$), life satisfaction (all $ps > .18$) and happiness (all $ps > .43$).

Emotion Regulation

As noted in Table 4.3, individual differences in SO ambivalence were unrelated to reappraisal (all $ps > .28$), suppression (all $ps > .58$), and rumination (all $ps > .63$).

Self-Identity

Centrality. As noted in Table 4.3, individual differences in SO ambivalence were unrelated to centrality (all $ps > .12$).

Ties. As noted in Table 4.3, individual differences in SO ambivalence were unrelated to ties (all $ps > .68$).

Evaluation of one's SO

In a regression analyses, individual differences in the amount and the direction of SO ambivalence and the respective interaction were included as the independent variables. The explicit and implicit measures of evaluation of one's SO were included as dependent variables. As noted in Table 4.3, individual differences in SO ambivalence were unrelated to scores on the explicit measure (all $ps > .59$). For the implicit measure, however, the analysis revealed a significant main effect of the amount of SO ambivalence, such that greater amounts of explicit-implicit SO ambivalence resulted in negative implicitly

measured evaluations of SO, $\beta = -.30$, $t(44) = -2.07$, $p = .05$. The analysis did not reveal any other significant effects (all $ps > .05$).

Table 4.3 Summary of standardised regression coefficients (β) and their significance – the effects of explicit-implicit SO ambivalence.

	Amount of SO ambivalence	Direction of SO ambivalence	Amount X Direction
Processing	.03	.15	.41 ^Δ
ESE	-.20	-.49*	.62*
ISE	.05	-.40	.24
ESE-ISE	-.22	-.07	.33
Life satisfaction	.20	-.09	.26
Happiness	.01	.21	.00
Reappraisal	-.02	-.29	.23
Suppression	.09	.02	.00
Rumination	.04	.13	.05
Centrality	-.23	-.02	-.23
Affect	-.04	-.03	.14
Ties	-.06	-.03	.07
Implicit evaluation of SO	-.30*	.00	-.06

* $p < .05$, ^Δ $p < .08$

Evaluation of one's SO – The effect of explicit-implicit discrepancy

Well-Being

Self-esteem. As can be seen from Table 4.4, individual differences in explicit-implicit ambivalence were found to relate to implicitly measured self-esteem and ESE-ISE discrepancy. With respect to ISE, a regression was conducted in which the amount and the direction of ambivalence and their interaction were used as the independent variables.. The analysis revealed a significant main effect of the direction of ambivalence, $\beta = .62$, $t(44) = 2.44$, $p = .02$. Overall, among those who were more positive towards their SO on the explicit measure relative to the implicit measure, there were higher levels of ISE.

With respect to ESE-ISE discrepancy a regression was conducted in which the amount and the direction of ambivalence and their interaction were used as the independent variables. The analysis revealed a significant main effect of the amount of ambivalence, $\beta = .33$, $t(44) = 2.25$, $p = .03$. In other words, discrepant explicitly and implicitly measured evaluations of one's SO was associated with discrepant self-esteem.

Other measures of well-being. As can be seen from Table 4.4, individual differences in the amount and the direction of ambivalence were unrelated to ESE (all $ps > .11$), life satisfaction (all $ps > .10$), and happiness (all $ps > .26$).

Emotion Regulation

Suppression. In a regression model, the amount and the direction of ambivalence and their interaction were used as the independent variables. The dependent variable was suppression score. The analysis revealed a significant

main effect of the direction of ambivalence, $\beta = -.53$, $t(44) = -2.10$, $p = .04$.

Overall, higher suppression was found among those who were less positive towards their SO on the explicit measure of affect relative to the implicit measure.

Other measures of emotion regulation. As can be seen from Table 4.4, individual differences in the amount and the direction of ambivalence were unrelated to reappraisal (all $ps > .18$), and rumination (all $ps > .35$).

Table 4.4 Summary of standardised regression coefficients (β) and their significance – the effect of discrepant explicitly and implicitly measured evaluations of one’s SO.

	Amount of Ambivalence	Direction of Ambivalence	Amount X Direction
ESE	.24	.23	-.04
ISE	-.14	.62*	-.27
ESE-ISE	.33*	-.18	.26
Life satisfaction	.25	-.15	-.04
Happiness	.17	-.03	.22
Reappraisal	.21	.10	.02
Suppression	-.03	-.53*	.20
Rumination	.01	-.25	-.02

* $p < .05$

Discussion

The research described in this chapter examined the effects of SO ambivalence and evaluations of SO in samples of gay-identified individuals. Overall, there were three objectives. The first was to investigate implications of SO ambivalence for information processing; the second was to investigate implications of SO ambivalence for psychological health; and the final aim was to examine consequences of discrepant explicit and implicit evaluations of one's SO. These objectives will now be discussed in turn.

On feeling torn about one's SO: The effects of explicit-implicit SO ambivalence in gay-identified individuals.

Information processing

In Study 4, the effects of SO ambivalence on information processing were examined by measuring response time to explicit questions on sexuality. The results revealed that SO ambivalence impacted the processing of SO-relevant information, but in ways different to those observed in straight-identified individuals. Among gay-identified individuals, a difference in deliberation as a function of the direction of SO ambivalence was observed only in those with high amounts of SO ambivalence. Specifically, individuals with high amounts of SO ambivalence spent longer completing explicit questions on sexuality when they reported being more gay on the explicit measure of SO relative to the implicit measure.

What might explain this finding? While more research would be necessary to make firm conclusions, this finding could reflect an identity conflict

– these individuals self-identify as gay, yet responses on the implicit measure of SO are less congruent with this perception. In other words, this could represent a group of individuals who have “come out” as gay while maintaining a degree of *opposite-sex* interest (with the latter perhaps impacting spontaneous, implicit evaluations of sexual identity). This interpretation is congruent with literature suggesting that labels of sexual orientation, such as straight and gay, do not capture the *complexity* that is sexual orientation (for a review see Diamond, 2003). For instance, whilst work has demonstrated that sexual orientation, over time, remains relatively stable (e.g., Diamond, 2000), other research has shown that people’s self-reported sexual orientation does not necessarily align with attraction and interest (Diamond, 1998; Gattis et al., 2012). As such, other authors have proposed new categories of sexual orientation. For example, in a survey of more than 1,700 individuals, Vrangalova and Savin-Williams (2012) measured self-reported sexual identity, sexual attraction, and sexual partners. Overall, the results supported a *five-category* model of SO that included traditional labels (i.e., straight, gay, bisexual), in addition to the categories of *mostly straight* and *mostly gay*. These latter categories reflected individuals who identified as either straight or gay, while having sexual attraction and partners that were distinct from the respective identity. As such, it is understandable that the deeper processing of SO-relevant information among those who reported being more gay on the explicit measure of SO relative to the implicit measure (in the context of high ambivalence) might reflect the complex phenomenon of sexual orientation: people feel compelled to report being gay because this is a

label of SO that is socially, culturally, and politically entrenched. However, such a label might not truly reflect underlying sexual attractions and behaviours, resulting in deep and systematic processing of relevant information when such a discrepancy occurs.

Psychological well-being

This study also investigated implications of SO ambivalence for psychological health. Significantly higher (explicitly measured) self-esteem was found among those who reported being less gay on the explicit measure of SO relative to the implicit measure (when the amount of SO ambivalence was low). It is possible to explain this effect in two ways. First, given that prejudice towards gay individuals remains widespread (Herek & McLemore, 2013), self-reported responses that minimise one's orientation (e.g., "I am not very gay") could be adaptive in light of such prejudice. Second, because high amounts of explicit-implicit ambivalence typically result in worse psychological outcomes (e.g., self-doubt and discrepant self-esteem; Briñol et al., 2006; Creemers et al., 2012; Schröder-Abé et al., 2007), low amounts of ambivalence should result in relatively better psychological outcomes. It is plausible that the combination of these two factors could result in higher levels of self-esteem in samples of gay-identified individuals.

Interestingly, Study 4 found an association between the experience of SO ambivalence and implicitly measured evaluations of one's SO. Specifically, greater amounts of SO ambivalence were associated with negative implicitly measured evaluations of SO. This finding implies that SO ambivalence is

associated with a known associate of minority stress, namely internalised negativity towards being gay (i.e., self-stigma, internalised homophobia; Hatzenbuehler et al., 2009; Meyer, 1995; Meyer, 2003). Why would SO ambivalence be associated with minority stress? While it is not possible to ascertain causality on the basis of the present study, one plausible explanation is that when a gay-identified individual is exposed to social contexts that increase minority stress, such individuals are motivated to conceal SO to avoid stigma (Baumeister et al., 2007; Critcher & Ferguson, 2014; Meyer, 2003). In this scenario, it is understandable that more traditional labels of SO (i.e., straight) would be affirmed, creating ambivalence between explicit measures of SO (I am straight) and implicit measures of SO (I am gay). As explicit-implicit ambivalence results in negative feelings (Briñol et al., 2006; Creemers et al., 2012; Schröder-Abé et al., 2007) gay-identified individuals might come to dislike the object *focal* to their ambivalence, resulting with internalised shame of being gay.

I like it and I don't like it – the effect of discrepant explicitly and implicitly measured evaluations of one's SO.

As an exploratory exercise, the final aim of Study 4 was to examine the effect of discrepant explicitly and implicitly measured evaluations towards one's SO. The most interesting finding concerned an association between the amount of ambivalence and discrepant self-esteem. In particular, there was a significant main effect of the amount of ambivalence on an index of discrepant (explicit-implicit) self-esteem. Overall, individuals with discrepant explicitly and implicitly measured evaluations towards their SO were more likely to report discrepant

self-esteem. On the basis of this finding, it is plausible that discrepant explicitly and implicitly measured evaluations towards one's SO could be associated with psychological outcomes specific to the experience of discrepant self-esteem including perfectionism (Frost, Marten, Lahart, & Rosenblate, 1990), actual-ideal discrepancy (Pelham & Swann, 1989), and out-group discrimination (Jordan et al., 2003).

CHAPTER FIVE:
WIDER IMPLICATIONS OF SO AMBIVALENCE AND DISCREPANT
EVALUATIONS OF SEXUAL ORIENTATION IN GAY-IDENTIFIED
INDIVIDUALS

Overview of Chapter

This chapter describes a study that builds on the findings in Study 4. In another sample of gay-identified individuals, one aim of Study 5 was to replicate the effects of SO ambivalence on the time taken to complete explicit questions on sexuality. The study found that those with high amounts of SO ambivalence took more time to complete the explicit questions, implying deeper processing. In Study 4, a main effect of the amount of ambivalence on implicitly measured negative evaluations of SO was found, suggesting that SO ambivalence could be associated with minority stress. To extend this finding, Study 5 investigated the association between SO ambivalence and another outcome of minority stress, discrimination on the basis of SO. The study found that participants who reported being less gay on the explicit measure of SO relative to their score on the implicit measure reported higher discrimination (directed towards gay-individuals generally and personally experienced discrimination within the last 12-months) when the amount of ambivalence was low.

In Study 4 discrepant explicit-implicit evaluations of one's SO related to discrepant explicit-implicit self-esteem. To extend this, Study 5 examined the impact of discrepant explicit-implicit evaluations of one's SO on outcomes related to discrepant self-esteem. Study 5 found that discrepant evaluations of

SO were associated with smaller actual-ideal discrepancies. Interestingly, those who positively evaluated their SO on the explicit measure whilst being *somewhat* (i.e., low ambivalence) more negative towards it on the implicit measure experienced a number of negative outcomes, including perfectionist tendencies, higher reports of discrimination (that experienced more than 12-months ago), and poorer psychological health.

Introduction

The work described in the previous chapter produced a number of novel findings regarding the effects of SO ambivalence and discrepant explicit-implicit evaluations of SO in a sample of *gay-identified* individuals. The research described in this chapter aims to extend these findings using a different sample of gay-identified males and females. The aims of the research will now be described in turn.

In Study 4, SO ambivalence impacted the processing of SO-relevant information among gay-identified individuals, but in a way different to those observed in straight-identified individuals. In particular, an interaction between the amount and the direction of SO ambivalence was found to impact the amount of time spent completing explicit questions on sexuality. When ambivalence was high, those who reported being more gay on the explicit measure of SO relative to the score on the implicit measure spent significantly more time completing the explicit questions about sexuality, implying deeper processing. Given the novel pattern of findings, one aim of Study 5 was to investigate the robustness of this

effect by conducting a direct replication. To the extent that this finding is robust, the following hypothesis was formed:

Hypothesis 5.1. There will be an interaction between the amount and the direction of SO ambivalence on the time taken to complete direct questions on sexuality. Among those with high ambivalence, individuals who report being more gay on the explicit measure of SO relative to the implicit measure will take significantly longer to respond to such questions compared to those who report being less gay on the explicit measure of SO relative to the implicit measure. For those with low ambivalence, the direction of SO ambivalence will not moderate the association with processing.

In the previous chapter, a main effect of the amount of explicit-implicit SO ambivalence on implicitly measured evaluations of one's SO was found. This implied that the greater the amount of SO ambivalence, the more negative participants felt about their sexual orientation. This finding suggests that SO ambivalence is associated with a known associate of minority stress, namely internalised shame of being gay (i.e., self-stigma / internalised homophobia; Hatzenbuehler et al., 2009; Meyer, 1995; 2003). To provide further evidence that SO ambivalence is associated with the experience of minority stress, the research in this chapter examines the association between SO ambivalence and another

factor known to result in minority stress, namely discrimination on the basis of SO.

Discrimination on the basis of SO was used as an outcome of minority stress based on research stemming from the Minority Stress Model (Meyer, 1995, 2003). This model argues that, on account of societal stigma, prejudice, and discrimination, gay-identified individuals are likely to experience negative mental health outcomes. As a starting point, research shows that sexual minorities are more likely to experience discrimination. In one example, Balsam, Rothblum, and Beauchaine (2005) measured levels of lifetime victimisation reported by sexual minorities and straight-identified individuals. The study found that sexual minorities were more likely to have experienced victimisation during both childhood and adulthood. Further, research has demonstrated that the experience of discrimination among sexual minorities is associated with psychological distress (Wamala, Boström, & Nyqvist, 2007), a link that diminishes when adjusting for discrimination (Frisell, Lichtenstein, Rahman, & Långström, 2010). Taken together, the research shows that gay-identified individuals are more likely to experience discrimination. On the basis of the finding in Study 4 – greater amounts of SO ambivalence result in negative implicit evaluations of SO – the following hypothesis was formed:

Hypothesis 5.2. To the extent that the greater amounts of SO ambivalence is associated with minority stress, higher levels of

discrimination on the basis of one's SO will be reported among those with high amounts of ambivalence.

A final finding from Study 4 that is focal to the present chapter was an association between discrepant explicit-implicit evaluations of one's SO and discrepant explicit-implicit self-esteem. To further investigate this finding, this chapter assessed whether discrepant explicit-implicit evaluations of one's SO predict known outcomes of discrepant self-esteem. This was done by including measures of perfectionism (Frost et al., 1990), self-discrepancy (Pelham & Swann, 1989), and out-group discrimination (Tajfel, 1970).

The rationale for including a measure of perfectionism stems from work conducted by Ziegler-Hill and Terry (2007); in their research, participants completed explicit and implicit measures of self-esteem, in addition to a measure of perfectionism. The measure of perfectionism (Frost et al., 1990) assessed two kinds of perfectionist tendencies. *Adaptive* perfectionism (e.g., "I set higher goals than most people") refers to traits that are associated with healthy functioning (e.g., positive affect; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993), whereas *maladaptive* perfectionism (e.g., "People will probably think less of me if I make a mistake") refers to high personal standards, and a need to avoid failure. This aspect of perfectionism is associated with poorer psychological functioning (e.g., anxiety; Suddarth & Slaney, 2001). Ziegler-Hill and Terry (2007) found that discrepant self-esteem was positively associated with both adaptive *and* maladaptive perfectionism.

Past research has revealed an association between discrepant self-esteem and *self-discrepancy* (Bosson, Brown, Zeigler-Hill & Swann, 2003; Haddock & Gebauer, 2011). Self-discrepancy measures (e.g., Pelham & Swann, 1989), ask participants to rate their current standing on a series of attributes (e.g., emotional stability, physical attractiveness), and where they would *ideally* like to fall on the same set of attributes. In one study, Bosson et al. (2003) asked participants to complete explicit and implicit measures of self-esteem in addition to a measure of self-discrepancy. Smaller actual-ideal discrepancies were found among participants with discrepant self-esteem.

The final outcome related to discrepant self-esteem considered in the present research was *out-group discrimination*. In one study example, Jordan et al. (2003) asked participants to complete explicit and implicit measures of self-esteem. To measure out-group discrimination, the minority-group paradigm was used (Tajfel, 1970). In this paradigm, participants are ostensibly allocated to a group (Group A; the in-group), and are then asked to assign points to other members in *their* group, in addition to members from another group (Group B). Jordan et al. (2003) found discrepant self-esteem to implicate in-group favouritism. Subsequent research demonstrated that this effect extends to more specific discriminatory behavioural responses such as ethnic discrimination (Jordan, Spencer, & Zanna, 2005).

The research described above implies that the experience of discrepant self-esteem is associated with psychological mechanisms designed to enhance self-worth (i.e., perfectionism, lower actual-ideal discrepancy, out-group

discrimination). On the basis of Study 4's finding of a positive association between discrepant explicit-implicit evaluations of one's SO *and* discrepant self-esteem, it is understandable that discrepant explicit-implicit evaluations of one's SO could also be associated with similar self-enhancement strategies. To this extent, the following hypothesis is formed:

Hypothesis 5.3. Higher levels of self-enhancement will be shown amongst those with discrepant explicit-implicit evaluations of one's SO. Specifically, among such individuals there will be higher scores on measures of perfectionism and out-group discrimination, and lower scores on a measure of actual-ideal discrepancy.

Finally, Study 5 included two exploratory measures, the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), and an assessment of the Big-Five personality constructs (Gosling, Rentfrow, & Swann, 2003). Past research has demonstrated that both of these measures are associated with an array of well-being outcomes including depression, self-esteem, alcoholism, and subjective well-being (Brown & Ryan, 2003; Gutiérrez, Jiménez, Hernández, & Puente, 2005; Laursen, Pulkkinen & Adams, 2002). As such, these measures were included to investigate the wider potential psychological impacts of SO ambivalence. Owing to the exploratory nature of this work, a priori hypotheses were not formed.

STUDY 5

The research in Study 5 had three predominate aims. The first was to replicate the effects of SO ambivalence on information processing. The second was to provide further evidence that the experience of SO ambivalence is associated with minority stress by investigating the association between SO ambivalence and discrimination on the basis of SO. The final aim was to examine the association between discrepant explicit-implicit evaluations of one's SO and self-enhancement strategies - perfectionism, self-discrepancy, and out-group discrimination.

Method

Participants

Thirty-nine self-identified gay individuals (9 females; $M_{\text{age}} = 37.97$ years, $SD = 11.94$) participated for a payment of £5. Participants were recruited via LGBT social groups and staff networks in South Wales. Participants were also recruited via a snowballing method. The sample size is lower than that recommended for a study with three predictor variables (60 participants; Faul et al., 2007). This was due to the difficulty of recruiting gay-identified participants for this research.

Materials

Sexual Orientation and Information Processing Measures

Sexual orientation and SO ambivalence. The explicit and implicit measures of SO were those outlined in the preceding studies. The explicit measure of SO was coded according to opposite-sex and same-sex attraction. As

described in Chapter Two, SO ambivalence was conceptualised in terms of individual differences in the amount of explicit-implicit discrepancy (the absolute difference between the standardized scores on the explicit and implicit measures of SO) and the direction of the discrepancy (dummy code of +1 or -1 according to the valence of the non-absolute difference between the standardized scores on the explicit and implicit measures of SO).

Processing of explicit questions on sexual orientation. The response time to each question on the explicit measure of SO was used to give an indication of the time spent processing various aspects of sexual orientation ($M = 3183.92\text{ms}$, $SD = 1119.89$).

Evaluation of One's SO

Explicit measure. This measure was the affect component of the measure of self-identity (see below).

Implicit Measure. This study used the same implicit measure that was outlined in Study 4. Split-half reliability analyses indicated good reliability (adjusted $r = .82$).

Measures of Self-Identity

This study used the three measures of self-identity described in Study 4. Based on Cameron's (2004) social identity measure, seven items measured the extent to which participants perceived their SO to be a part of the self (the *centrality* component; $\alpha = .85$). Five items measured positive and negative feelings participants felt towards their SO (the *affect* component; $\alpha = .86$). Six

items measured perceived similarities and commonalities with other gay individuals (the *ties* component; $\alpha = .81$).

Measures of Well-being

Measures of self-esteem. The study used the single-item explicit (ESE; Robins et al., 2001) and implicit (ISE; Gebauer et al., 2008) measures described in Study 1.

ESE-ISE discrepancy. To examine the effects of discrepant SE, a participant's standardised ISE score was subtracted from their standardised ESE score (see Study 4). Using this conceptualisation, a negative score refers to ISE being higher than ESE, whereas a positive score refers to ISE being lower than ESE.

Positive and negative affect scales (PANAS). Participants were presented with 17 different feelings and emotions (Watson, Clark, & Tellegen, 1988; $\alpha = .90$).¹⁵ Nine of these correspond to negative affect (e.g., jittery, afraid; reverse scored), whereas the remaining eight correspond to positive affect (e.g., excited, active). Participants indicated the extent to which they *generally* felt each emotion using a judgement from 1 (very slightly or not at all) to 5 (extremely). A higher score on this index was indicative of more positive affect. For a list of the items, see Appendix 11.

Measures of Discrimination on the Basis of SO

Eighteen items were used to assess discrimination on the basis of SO. These items were based on those used by the European Union Agency of

¹⁵ A technical issue meant that three emotions were missed out (2 positive, 1 negative).

Fundamental Human Rights to assess homophobia and discrimination across EU member states (FRA, 2013). Six items measured *group-level* discrimination ($\alpha = .90$). Example items include “How widespread are casual jokes in everyday life about gay individuals?” and “How widespread are expressions of hatred and aversion towards gay individuals?” Participants responded to these items using a nine-point scale (1 = not at all widespread; 9 = very widespread). A further six items measured *personal* discrimination on the grounds of SO. Example items include “I have felt discriminated or harassed on the grounds of sexual orientation” and “I have felt discriminated because of being gay at work.” Participants responded using a nine-point scale (1 =strongly disagree; 9 =I strongly agree). Participants were first instructed to complete the items with reference to the past 12 months ($\alpha = .79$) and then the items were completed again to report discrimination that was experienced more than 12 months ago ($\alpha = .73$). For a list of the items, see Appendix 12.

Correlates of Discrepant Self-Esteem Measures

Multidimensional Perfectionism Scale. Thirty-five items were used to assess adaptive and maladaptive forms of perfectionism (Frost et al., 1990). Adaptive perfectionism items ($\alpha = .86$) include personal standards (e.g., “I set higher goals than most people”) and organisation (e.g., “Neatness is very important to me”). The remaining items measured maladaptive forms of perfectionism ($\alpha = .94$) including concern over mistakes (e.g., “If I fail partly, it is as bad as being a complete failure”), parental criticism (e.g., “As a child, I was punished for doing things less than perfect”), parental expectations (e.g., “Only

outstanding performance is good enough in my family”), and doubts over actions (e.g., “I tend to get behind in my work because I repeat things over and over”).

Participants responded to each item using a nine-point scale (1 = I strongly disagree; 9 = I strongly agree). For a list of the items, see Appendix 13.

Actual-ideal discrepancy. Based on a self-ideal discrepancy measure introduced by Pelham and Swann (1989), participants rated the certainty of their *current* standing on a list of 10 attributes (e.g., intellectual ability, social skills/competence). Participants responded using a nine-point scale from 1 (not at all certain) to 9 (extremely certain). Subsequently, participants rated their *ideal* standing for the same attributes using a nine-point scale from 1 (not reflective of ideal self) to 9 (very reflective of ideal self). Actual-ideal discrepancy was calculated by subtracting current-self score (averaged across attributes) from ideal-self score (averaged across attributes). For a list of the items, see Appendix 14.

Out-group discrimination. Based on a procedure outlined by Jordan et al. (2003) participants were initially allocated into a group based on their “performance” in three different tasks. In the first, participants saw an image and were told to select an area that stood out the most. In the second, participants were presented with an image containing a large number of different coloured dots – participants were then instructed to estimate the number of pink dots on the screen. Finally, participants saw an image of an optical illusion, and were asked to indicate the direction of movement (clockwise or anti-clockwise). Afterwards, participants were told “based on your performance, you have been

placed into a group of individuals known as Group A.” Participants were also told that other individuals, based on their performance, are placed into Group B. Owing to all participants being placed into Group A, this is defined here as the *in-group*, whereas Group B is the *out-group*.

Participants then completed a point allocation task using Tajfel’s (1970) minimal group paradigm matrices. In this task participants allocate points to members within their in-group (i.e., Group A) and to members in the out-group (i.e., Group B). In line with past research (e.g., Rubin, Paolini, & Crisp, 2010) the mean difference in point allocation was calculated. Specifically, the mean number of points allocated to the out-group (i.e., Group B) was subtracted from the mean number of points allocated to the in-group (i.e., Group A). As such, a higher score on this index showed greater in-group bias, and hence greater out-group discrimination. See Appendix 15 for an overview of the procedure.

Exploratory Measures

Mindful Attention Awareness Scale (MAAS). Participants responded to 15 items developed by Brown and Ryan (2003; $\alpha = .85$). Example items include “I could be experiencing some emotion and not be conscious of it until sometime later” and “I rush through activities without being very attentive to them.” Participants responded using a six-point scale from 1 (almost always) to 6 (almost never). For a list of the items, see Appendix 16.

Big-five personality constructs. Participants indicated their standing on a list of 10 attributes (Gosling et al., 2003). Participants rated two attributes per personality construct including extraversion (e.g., “I see myself as extraverted,

enthusiastic”), agreeableness (e.g., “I see myself as sympathetic, warm”), conscientiousness (e.g., “I see myself as dependable, self-disciplined”), emotional stability (e.g., “I see myself as calm, emotionally stable”), and openness to experiences (e.g., “I see myself as open to new experiences, complex”).

Participants responded using a nine-point scale from 1 (I strongly disagree) to 9 (I strongly agree). For a list of the items, see Appendix 17.

Procedure

The study was conducted using DirectRT (Jarvis, 2008) and Qualtrics (2013). Participants first completed the explicit measure of SO prior to the implicit measures of SO and evaluation (via Direct RT). Participants then completed the measures of self-identity, well-being, discrimination on the basis of SO, correlates of discrepant self-esteem, and the exploratory measures (via Qualtrics).¹⁶

Results

Owing to the number of findings presented, the results are split into three sections. The first section presents relevant descriptive statistics and relationships among the measures. At the end of this section are correlation tables detailing the associations among the key variables in the study. The second section focuses on the consequences of explicit-implicit SO ambivalence. The third section focuses on the effects of discrepant responses on explicit and implicit measures of evaluation towards one’s SO. At the end of the second and

¹⁶ Qualtrics was used in this study owing to the number of measures – this experimental platform permits easier data extraction.

third sections, for convenience, are tables summarising the standardised regression coefficients for each analysis.

Descriptive statistics

Sexual orientation measures. As would be expected among gay-identified individuals, participants were significantly more attracted to same-sex ($M = 8.90, SD = .19$) than opposite-sex individuals ($M = 1.75, SD = 1.14; t(38) = -37.29, p < .0001$). The implicit measure of SO showed an IAT effect indicative of a gay SO ($MD' = -.86, SD = .30$). This value was statistically different from zero, indicating that the measure assessed a difference in valence between the critical blocks, $t(38) = -17.74, p < .0001$.

Responses on the explicit and implicit measures of SO were not correlated, $r(37) = -.04, p = .80$.

Relationships among the measures

Sexual orientation measures. A positive association was found between scores on the explicit measure of SO, extraversion ($r(37) = .33, p = .04$), and openness to new experiences ($r(37) = .34, p = .04$). These correlations suggest that participants who were more straight on the explicit measure of SO were more extraverted and open to new experiences.

Scores on the implicit measure of SO were negatively associated with the self-identity variable, ties ($r(37) = -.37, p = .02$), and extraversion ($r(37) = -.46, p = .003$) – participants who were more gay on the implicit measure of SO reported more social connections and commonalities with other gay individuals and were more extraverted.

Evaluation of one's SO. Explicitly measured evaluations of SO positively correlated with scores on the PANAS ($r(37) = .37, p = .02$) and MAAS ($r(37) = .47, p = .003$), and negatively correlated with perfectionism ($r(37) = -.54, p < .0001$). Implicitly measured evaluations were not correlated with the other variables.

Table 5.1 Sexual orientation measures – summary of correlations, means and standard deviations

Measure	1	2	3	4	<i>M</i>	<i>SD</i>
1. Explicit SO	-	-.01	.04	.02	-7.14	1.20
2. Implicit SO	-.01	-	-.01	-.01	-.86	.30
3. Explicit eval. of SO	.04	-.01	-	-.08	7.87	1.46
4. Implicit eval. of SO	.02	-.01	-.08	-	.51	.45

Table 5.2 Measures of self-identity – summary of correlations, means and standard deviations (1 – 4 correspond to the SO measures in Table 5.1).

Measure	1	2	3	4	5	6	<i>M</i>	<i>SD</i>
5. Centrality	-.05	-.14	.08	-.09	-	.25	6.21	1.76
6. Ties	.05	-.34*	.11	.16	.25	-	6.62	1.33

* $p < .05$

Table 5.3 Well-being measures – summary of correlations, means and standard deviations (1 – 4 correspond to the SO measures in Table 5.1).

Measure	1	2	3	4	7	8	9	10	<i>M</i>	<i>SD</i>
7. ESE	.00	-.13	.00	.14	-	.31	.59**	.67**	5.59	2.21
8. ISE	.12	.11	.13	.10	.31	-	-.59**	.40*	7.43	1.86
9. ESE-ISE	-.10	-.21	-.17	.04	.59**	-.59**	-	.23	.00	1.18
10. PANAS	.02	-.14	.37*	.08	.40*	.67**	.23	-	5.81	.62

** $p < .01$ * $p < .05$

Table 5.4 Discrimination on the basis of SO measures – summary of correlations, means and standard deviations (1 – 4 correspond to the SO measures in Table 5.1).

Measure	1	2	3	4	11	12	13	<i>M</i>	<i>SD</i>
11. Group-level	.10	.01	-.06	.17	-	.22	.43**	5.66	1.72
12. Personal recent	.16	-.18	.12	-.02	.22	-	.71**	2.46	1.58
13. Personal > 12-months ago	-.01	-.02	.15	-.02	.43**	.71**	-	3.21	1.64

** $p < .01$ * $p < .05$

Table 5.5 Correlates of discrepant self-esteem measures – summary of correlations, means and standard deviations (1 – 4 correspond to the SO measures in Table 5.1).

Measure	1	2	3	4	14	15	16	<i>M</i>	<i>SD</i>
14. Perfectionism	-.15	-.13	-.54**	.16	-	.09	.14	4.38	1.39
15. Actual-ideal	-.01	.08	.14	-.05	.09	-	.15	1.52	1.60
16. Out-group discrim.	-.07	-.28	.07	.09	.14	.15	-	2.40	3.42

** $p < .01$

Table 5.6 Exploratory measures – summary of correlations, means and standard deviation (all measures in Table 5.1).

Measure	1	2	3	4	17	18	19	20
17. MAAS	.16	-.06	.47**	-.27	-	.20	.13	.55**
18. Extraversion	.33*	-.46**	.09	.01	.20	-	-.18	.09
19. Agreeableness	.16	-.20	.04	-.03	.13	-.18	-	.21
20. Emotional stability	.01	.01	.25	.12	.55**	.09	.21	-
21. Conscientiousness	-.09	-.13	.21	-.05	.48**	.28	.06	.34*
22. Openness	.34*	-.26	.09	.01	.07	.63*	-.09	-.06

Consequences of Explicit-Implicit SO Ambivalence on Information Processing

In a regression model the amount and the direction of ambivalence and their interaction were used as the independent variables. The dependent variable was the mean reaction time of all items on the explicit measure of SO. The analysis revealed a significant main effect of the amount of SO ambivalence, $\beta = .37$, $t(35) = 2.18$, $p = .04$. Overall, greater ambivalence was associated with more time reading and responding to questions on sexuality, implying more systematic processing. The main effect of the direction of SO ambivalence ($\beta = .11$, $t < 1$), in addition to the interactive effects ($\beta = .12$, $t < 1$), were not significant. In Study 4, the effect of the amount of SO ambivalence on processing was moderated by the direction of ambivalence, as such, hypothesis 5.1 was not supported.

Measures of Self-Identity¹⁷

Centrality. As noted in Table 5.2, individual differences in SO ambivalence were unrelated to centrality (all $ps > .18$).

Ties. In a regression model the amount and the direction of ambivalence and their interaction were used as the independent variables. The dependent variable was the mean ties score. The analysis revealed a marginal main effect of the amount of SO ambivalence, $\beta = -.32$, $t(35) = -1.82$, $p = .08$. This suggests that greater SO ambivalence coincides with less social connections and reported commonalities with other self-identified gay individuals. Other significant effects were not identified (all $ps > .19$).

¹⁷ An analysis was not performed on a composite identity index owing to the low correlation between the self-identity variables in this sample (See Table 5.1).

Evaluation of One's SO.

Explicit measure. In a regression model the amount and the direction of ambivalence and their interaction were used as the independent variables.

Explicitly measured evaluations of one's SO was the dependent measure. The analysis did not reveal any significant effects, however, a pattern suggested that greater amounts of ambivalence tended to be associated with less positive evaluations, $\beta = -.30$, $t(35) = -1.65$, $p = .11$. This suggests that greater SO ambivalence tends to result in less positive a evaluations towards one's SO.

Implicit measure. As noted in Table 5.2, individual differences in SO ambivalence were unrelated to implicitly measured evaluations of SO (all $ps > .60$). This finding diverges with that found in Study 4.

Measures of Well-Being

Self-esteem. As noted in Table 5.2, individual differences in SO ambivalence were unrelated to ESE (all $ps > .13$), ISE (all $ps > .13$), and ESE-ISE discrepancy (all $ps > .52$).

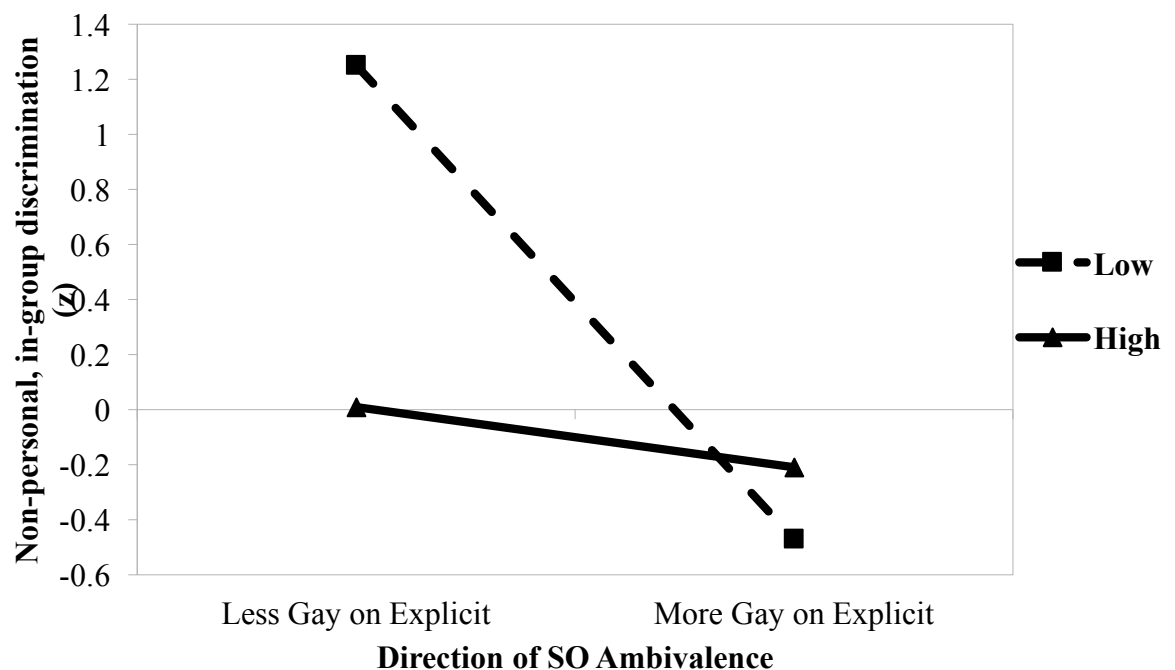
PANAS. As noted in Table 5.2, individual differences in SO ambivalence were unrelated to responses on the PANAS (all $ps > .14$).

Measures of Discrimination on the basis of SO

Non-personal (in-group) discrimination. In a multiple regression model, the amount and the direction of ambivalence and their interaction were included as the independent variables. The dependent variable was perceived non-personal anti-gay discrimination. The analysis revealed an interaction between the amount and the direction of SO ambivalence, $\beta = .53$, $t(35) = 2.00$, $p = .05$ (see Figure 5.1). This interaction reveals greater perceptions of in-group anti-gay discrimination among those who report being less gay on the explicit measure of SO relative to

their score on the implicit measure when the amount of ambivalence is low. This is found when these individuals are compared to those with high amounts of ambivalence in the same direction ($\beta = -.62, t(35) = -1.97, p = .06, d = .67$), in addition to those who report being more gay on the explicit measure of SO relative to their score on the implicit measure when ambivalence is low, $\beta = -.86, t(35) = -2.11, p = .04, d = .71$.

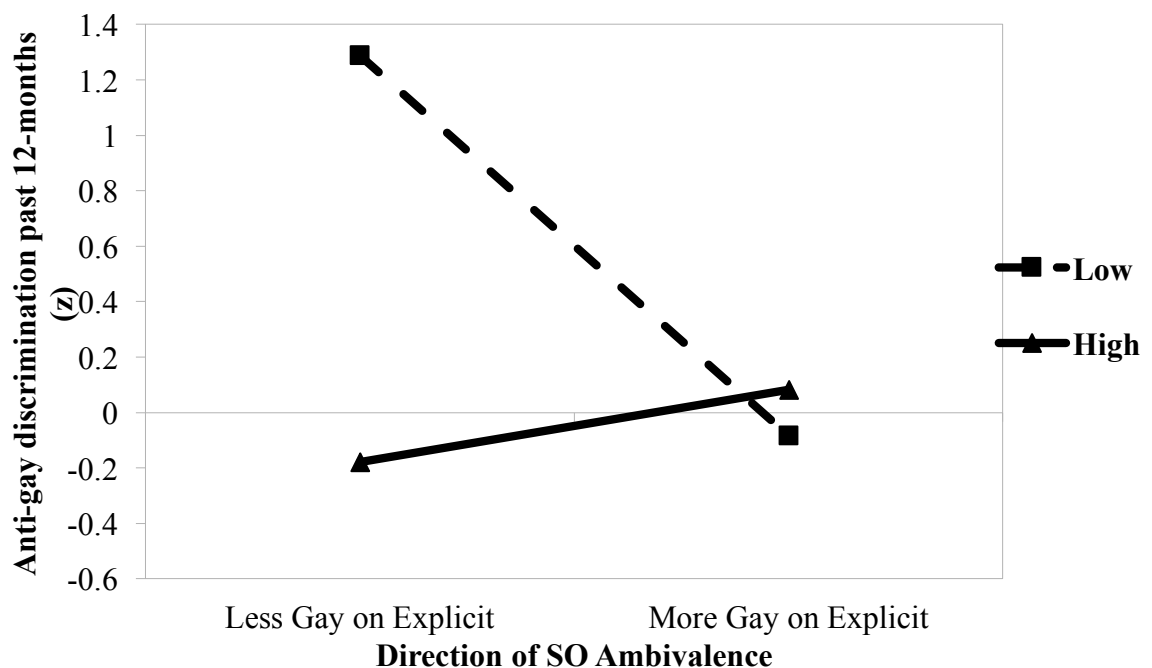
Figure 5.1 The impact of the amount of SO ambivalence (separate lines) and the direction of SO ambivalence (x-axis) on non-personal anti-gay discrimination.



Personal discrimination experienced within the past 12-months. In a multiple regression model, the amount and the direction of ambivalence and their interaction were included as the independent variables. The dependent variable was personally experienced anti-gay discrimination in the past 12-months. The

analysis revealed a significant interaction between the amount and the direction of SO ambivalence, $\beta = .58$, $t(35) = 2.21$, $p = .03$. This interaction replicated the pattern observed above. In particular, more anti-gay discrimination was reported among those who report being less gay on the explicit measure of SO relative to their score on the implicit measure when the amount of ambivalence is low. This is found when these individuals are compared to those with high amounts of ambivalence in the same direction ($\beta = -.73$, $t(35) = -2.37$, $p = .02$, $d = .80$), in addition to those who report being more gay on the explicit measure of SO relative to their score on the implicit measure when ambivalence is low, $\beta = -.69$, $t(35) = -1.70$, $p = .10$, $d = .57$.

Figure 5.2 The impact of the amount of SO ambivalence (separate lines) and the direction of SO ambivalence (x-axis) on anti-gay discrimination in the past 12 months.



Personal discrimination experienced more than 12-months ago. In a multiple regression model, the amount and the direction of ambivalence and their interaction were included as the independent variables. The dependent variable was personally experienced anti-gay discrimination more than 12-months ago. The analysis revealed a marginally significant main effect of the amount of SO ambivalence, $\beta = -.35$, $t(35) = -1.90$, $p = .07$. Overall, greater amounts of ambivalence were associated with less anti-gay discrimination. The analysis did not reveal any other significant effects (all $ps > .17$).

Summary. On the basis of the above findings, support for hypothesis 5.2 (an association between the amount of SO ambivalence and discrimination on the basis of SO) was not supported.

Correlates of Discrepant Self-Esteem Measures

Perfectionism and actual-ideal discrepancy. As noted in Table 5.2, individual differences in SO ambivalence were unrelated to perfectionism (all $ps > .59$) and actual-ideal discrepancy (all $ps > .27$).

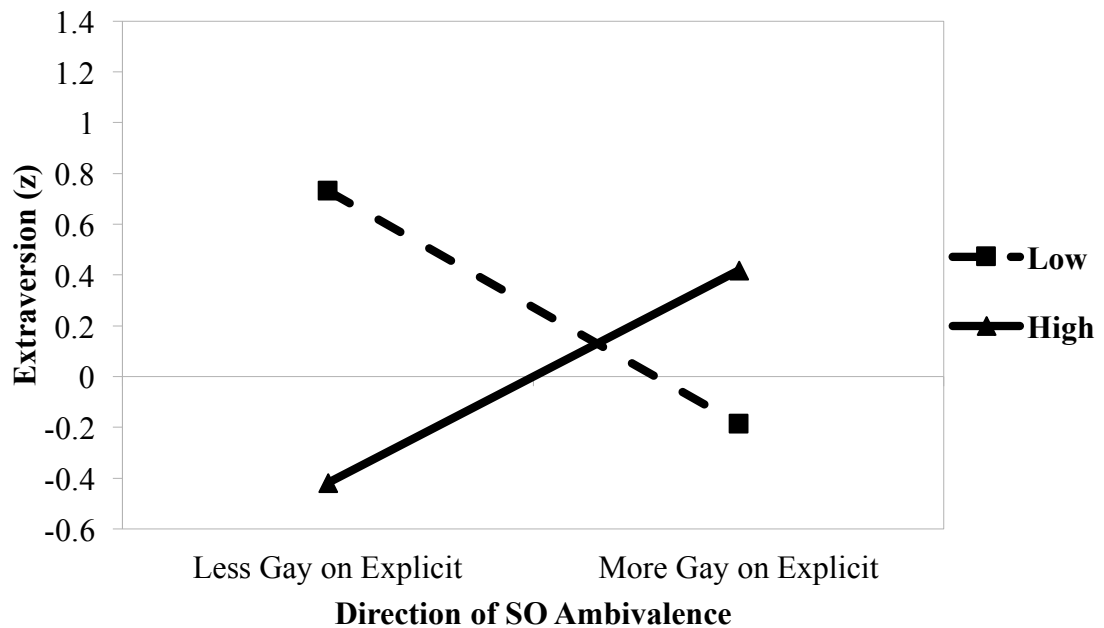
Out-group discrimination. In a multiple regression model, the amount and the direction of ambivalence and their interaction were included as the independent variables. The dependent variable was the measure of out-group discrimination. The analysis revealed a significant main effect of the direction of SO ambivalence, such that those who reported being *more gay* on the explicit measure of SO relative to the implicit measure showed more out-group discrimination, $\beta = .60$, $t(35) = 2.49$, $p = .02$. As shown in Table 5.2, all other effects were non-significant (all $ps > .20$).

Exploratory Measures

MAAS. As noted in Table 5.2, individual differences in SO ambivalence were unrelated to MAAS (all $ps > .33$).

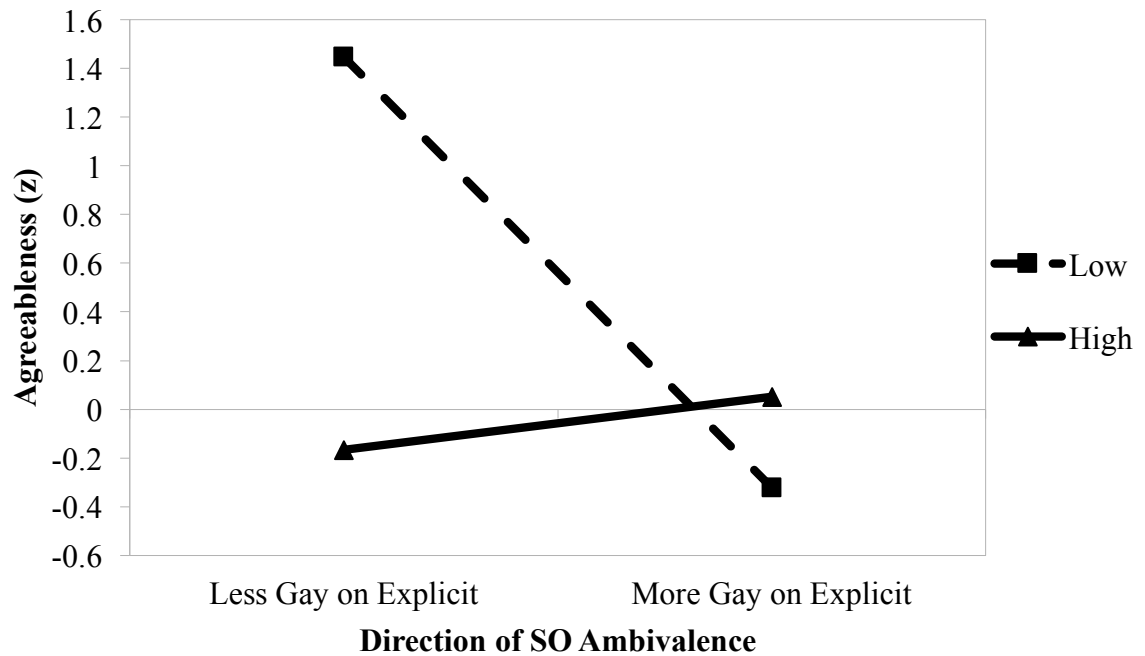
Big-five personality constructs. (1) Extraversion: In a multiple regression model, the amount and the direction of ambivalence and their interaction were included as the independent variables. The dependent variable was extraversion score. The analysis revealed a significant interaction between the amount and the direction of SO ambivalence, $\beta = .44$, $t(35) = 2.65$, $p = .01$ (See Figure 5.3). Greater extraversion was found among those who report being less gay on the explicit measure of SO relative to their score on the implicit measure when the amount of ambivalence is low. This is found when these individuals are compared to those with high amounts of ambivalence in the same direction ($\beta = -.58$, $t(35) = -2.06$, $p = .05$, $d = .70$).

Figure 5.3 The impact of the amount of SO ambivalence (separate lines) and the direction of SO ambivalence (x-axis) on Extraversion.



(2) Agreeableness: In a multiple regression model, the amount and the direction of ambivalence and their interaction were included as the independent variables. The dependent variable was agreeableness score. The analysis revealed a significant interaction between the amount and the direction of SO ambivalence, $\beta = .50$, $t(35) = 2.54$, $p = .02$ (see Figure 5.4). Greater agreeableness was found among those who report being less gay on the explicit measure of SO relative to their score on the implicit measure when the amount of ambivalence is low. This is found when these individuals are compared to those with high amounts of ambivalence in the same direction ($\beta = -.81$, $t(35) = -2.66$, $p = .01$, $d = .90$), in addition to those who report being more gay on the explicit measure of SO relative to their score on the implicit measure when ambivalence is low, $\beta = -.89$, $t(35) = -2.12$, $p = .04$, $d = .72$.

Figure 5.4 The impact of the amount of SO ambivalence (separate lines) and the direction of SO ambivalence (x-axis) on Agreeableness.



(3) Conscientiousness: As noted in Table 5.2, individual differences in SO ambivalence were unrelated to conscientiousness (all $ps > .72$).

(4) Emotional stability: As noted in Table 5.2, individual differences in SO ambivalence were unrelated to conscientiousness (all $ps > .34$).

(5) Openness to experiences: In a multiple regression model, the amount and the direction of ambivalence and their interaction were included as the independent variables. The dependent variable was openness to experiences score. The analysis did not reveal any significant effects, however, an interaction between the amount and the direction of SO ambivalence follows the pattern of results found for extraversion and agreeableness, $\beta = .30$, $t(35) = 1.63$, $p = .11$.

Table 5.7 Summary of standardised regression coefficients (β) and their significance.

	Amount of SO Ambivalence	Direction of SO Ambivalence	Amount X Direction
Processing	.37*	.11	.12
Implicit evaluation of SO	.01	-.11	.10
Centrality	-.26	-.16	.30
Affect / explicit evaluation of SO	-.30	-.04	.20
Ties	-.32 ^Δ	.11	.35
ESE	-.06	.40	-.18
ISE	.09	.24	-.21
ESE-ISE	-.12	.13	.03
PANAS	-.28	-.02	.26
Perfectionism	-.03	-.14	.11
Actual-Ideal	-.21	-.15	.15
Out-group discrim.	.06	.60*	-.34
Non-personal discrim.	-.24	-.48 ^Δ	.54 ^Δ
Discrim. past 12-months	-.31	-.27	.58*
Discrim. > 12-months	-.35 ^Δ	-.28	.37
MAAS	.02	.25	-.04
Extraversion	-.13	-.02	.63*
Agreeableness	-.26	-.38	.63*
Conscientiousness	-.07	-.02	.07
Emotional stability	-.18	-.17	.21
Openness to new experiences	-.12	.07	.30

* $p < .05$ ^Δ $p < .10$

On feeling torn: Consequences of explicit-implicit ambivalence – a summary of the key findings

The results revealed a number of novel effects relative to those described in Study 4. As a starting point, in a different sample of self-identified gay individuals, an association between the experience of SO ambivalence and the processing of explicit questions on sexuality was found. Specifically, among individuals with greater explicit-implicit SO ambivalence, more time was spent completing explicit questions about sexuality. This finding is somewhat different to that described in Study 4, where this main effect was moderated by the direction of SO ambivalence. As such, the findings from this study do not support hypothesis 5.1.

To the extent that SO ambivalence and minority stress are linked, hypothesis 5.2 predicted an association between explicit-implicit SO ambivalence and a factor known to implicate minority stress, discrimination on the basis of SO. Unfortunately, there was no support for this hypothesis. Furthermore, there was no association between the experience of SO ambivalence and negative implicitly measured evaluations of one's SO. Despite this, the study did reveal that more specific individual differences in SO ambivalence were associated with discrimination. Specifically, among individuals who reported being *less gay* on the explicit measure of SO relative to their responses on the implicit measure, high levels of discrimination were measured when the amount of SO ambivalence was low. This was the case for reports of group directed discrimination (i.e., that which is directed against *all* gay-identified individuals within society) in addition to discrimination on the basis of SO directed towards the self in the past 12 months.

Interestingly, the same pattern of findings was revealed for a number of the Big-Five personality characteristics. In particular, higher levels of extraversion and

agreeableness were measured among those who reported being less gay on the explicit measure of SO relative to the implicit measure when the amount of ambivalence was low.

The results also revealed an unexpected finding linking the experience of SO ambivalence to out-group discrimination. In particular among those who reported being *more gay* on the explicit measure of SO relative to their response on the implicit measure, significantly higher levels of out-group discrimination were measured via the minimal group paradigm.

The Impact of Discrepant Explicitly and Implicitly Measured Evaluations Towards One's SO

For ease, the results presented first in this section are those directly relevant to hypothesis 5.3 – an association between discrepant explicit-implicit evaluations of one's SO on outcomes of self-enhancement (perfectionism, actual-ideal discrepancy, and out-group discrimination). Other pertinent findings are reported subsequently.

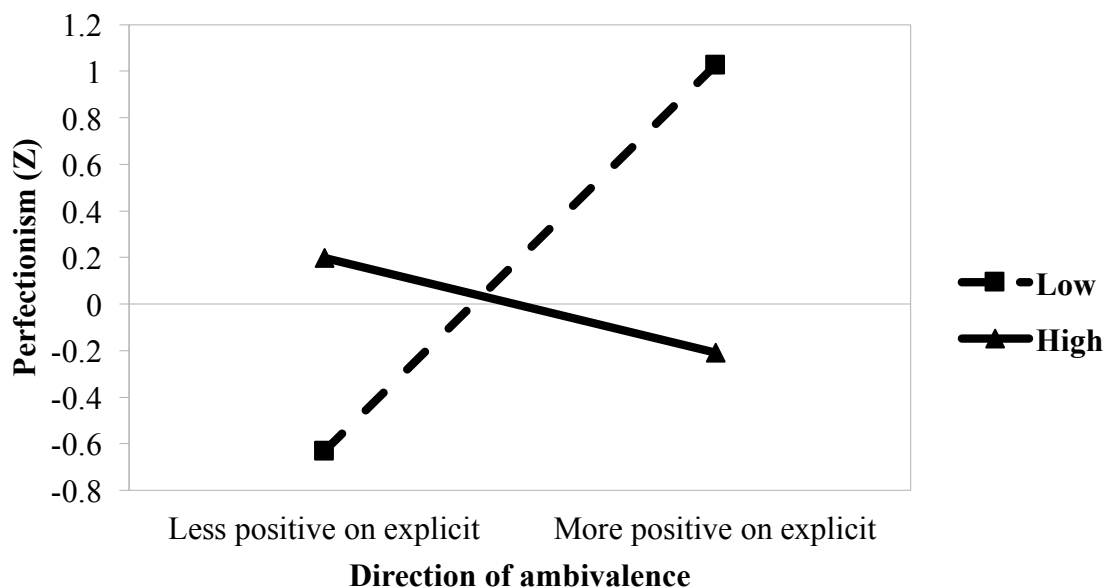
Associates of Discrepant Self-Esteem

Perfectionism. In a multiple regression model, the amount and the direction of ambivalence and their interaction were included as the independent variables. The dependent variable was the *overall* perfectionism score.¹⁸ The analysis revealed a significant interaction between the amount and the direction of ambivalence, $\beta = -.76$, $t(35) = -2.66$, $p = .01$ (see Figure 5.5). In particular, when the amount of ambivalence was low, higher perfectionist tendencies were found

¹⁸ Separate analyses for adaptive and maladaptive perfectionism are not reported owing to the convergent significant interactive effects on both of these variables: adaptive ($\beta = -.74$, $t(35) = -2.45$, $p = .02$), maladaptive ($\beta = -.68$, $t(35) = -2.41$, $p = .02$). This is the case despite these two variables being only moderately correlated, $r(35) = .28$, $p = .09$.

among those who were more positive towards their SO on the explicit measure relative to the implicit measure. This was the case when these individuals were compared to those with a high amount of ambivalence in the same directional context ($\beta = -.62, t(35) = -1.86, p = .07, d = .63$), in addition to those who were less positive towards their SO on the explicit measure relative to the implicit measure when the amount of ambivalence was low ($\beta = .83, t(35) = 1.88, p = .07, d = .64$). This is consistent with the idea that there is a link between this kind of explicit-implicit ambivalence and the self-enhancement mechanism of perfectionism.

Figure 5.5 The impact of discrepant explicitly and implicitly measured evaluations towards one's SO on perfectionism. Separate lines represent the amount of ambivalence. The direction of ambivalence is shown on the x-axis.



Actual-idea discrepancy. In a multiple regression model, the amount and the direction of ambivalence and their interaction were included as the independent variables. The dependent variable was actual-ideal discrepancy score.

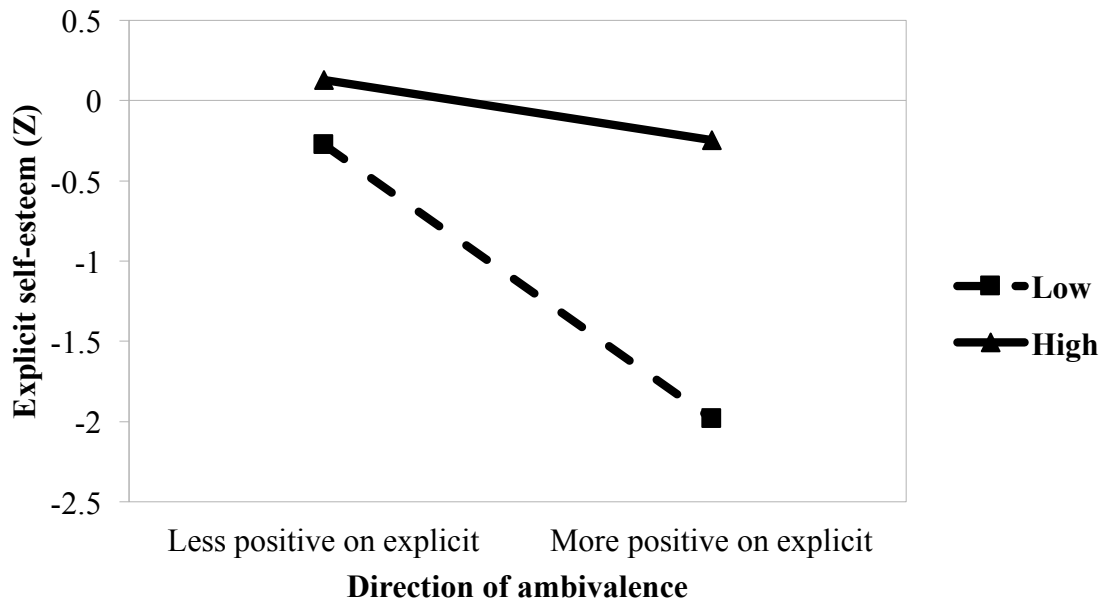
Consistent with hypothesis 5.3, there was a marginally significant main effect of the amount of ambivalence, $\beta = -.32$, $t(35) = -1.77$, $p = .08$. Overall, discrepant explicit-implicit evaluations towards one's SO were associated with less actual-ideal discrepancy. This lends some support to the idea that this kind of explicit-implicit ambivalence could be linked to self-enhancement.

Out-group discrimination. As can be seen in Table 5.3, individual differences in ambivalence were unrelated to out-group discrimination (all $ps > .49$). As such, support for hypothesis 5.3 is not provided with respect to this outcome.

Measures of Well-Being

Self-esteem. In a multiple regression model, the amount and the direction of ambivalence and their interaction were included as the independent variables. Explicitly measured self-esteem was included as the dependent variable. The analysis revealed a significant main effect of the amount of ambivalence, such that those with greater ambivalence had higher self-esteem, $\beta = .53$, $t(35) = 2.66$, $p = .01$. This main effect was qualified by a marginal interaction between the amount and the direction of ambivalence, $\beta = .33$, $t(35) = 1.66$, $p = .11$ (See Figure 5.6). When individuals were more positive towards their SO on the explicit measure relative to the implicit measure, lower ESE was reported when the amount of ambivalence was low. This was found when these individuals were compared to those with a high amount of ambivalence in the same directional context ($\beta = .87$, $t(35) = 2.54$, $p = .02$, $d = .86$), in addition to those who were less positive towards their SO on the explicit measure relative to the implicit measure when the amount of ambivalence was low ($\beta = -.85$, $t(35) = -1.87$, $p = .07$, $d = .63$).

Figure 5.6 The impact of discrepant explicitly and implicitly measured evaluations towards one's SO on explicitly measured self-esteem. Separate lines represent the amount of ambivalence. The direction of ambivalence is shown on the x-axis.

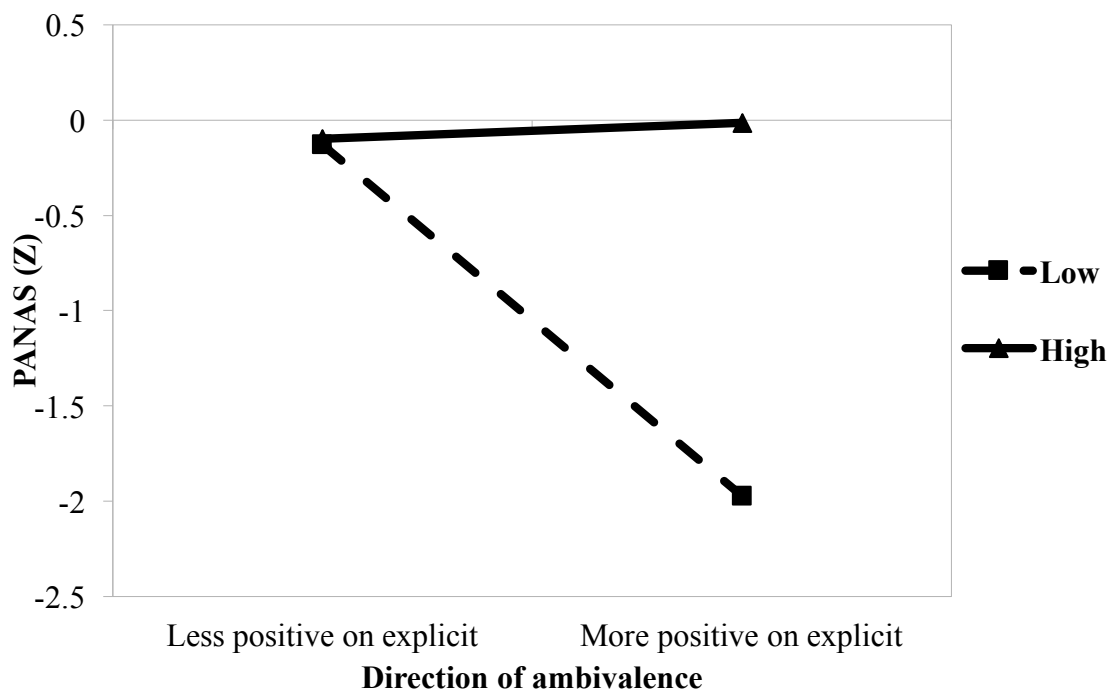


As can be seen in Table 5.3, individual differences in ambivalence were unrelated to implicitly measured self-esteem (all p 's > .19).

PANAS. In a multiple regression model, the amount and the direction of ambivalence and their interaction were included as the independent variables. The dependent variable was overall PANAS score. The analysis revealed a significant main effect of the amount of ambivalence, such that those with great ambivalence reported more positive affect, $\beta = .42$, $t(35) = 2.47$, $p = .02$. However, this main effect was qualified by a significant interaction between the amount and the direction of ambivalence, $\beta = .71$, $t(35) = -2.40$, $p = .04$ (see Figure 5.7). When individuals were more positive towards their SO on the explicit measure relative to the implicit measure, less positive affect on the PANAS was reported when the

amount of ambivalence was low. This was found when these individuals were compared to those with a high amount of ambivalence in the same directional context ($\beta = .98, t(35) = 2.87, p = .01, d = .97$), in addition to those who were less positive towards their SO on the explicit measure relative to the implicit measure when the amount of ambivalence was low ($\beta = -.92, t(35) = -2.02, p = .05, d = .68$).

Figure 5.7 The impact of discrepant explicitly and implicitly measured evaluations towards one's SO on PANAS. Separate lines represent the amount of ambivalence. The direction of ambivalence is shown on the x-axis.



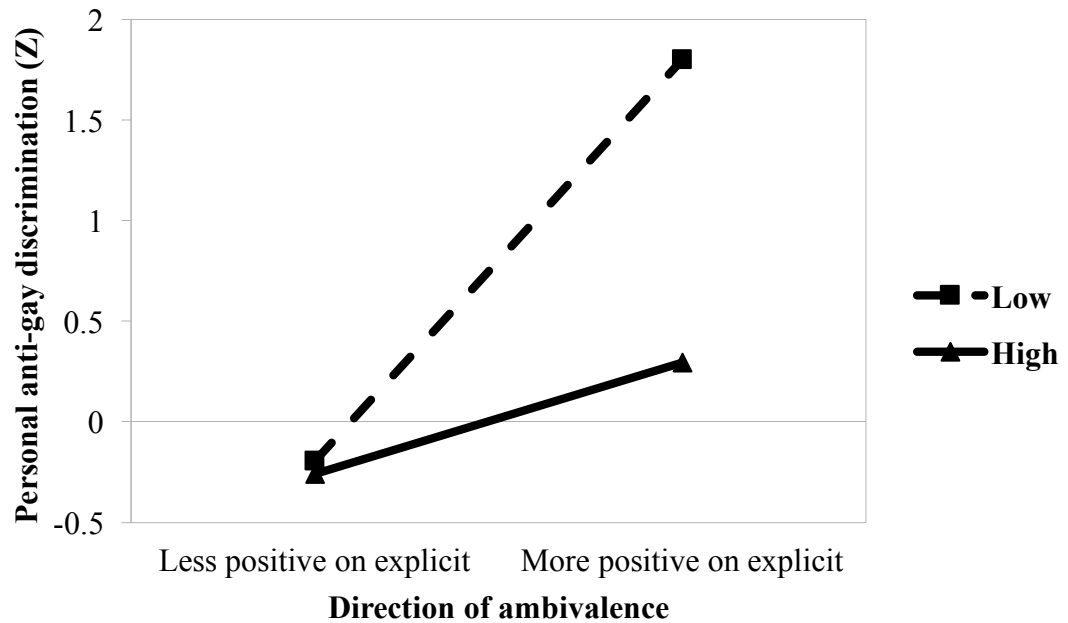
Measures of Discrimination on the basis of SO

Non-personal (in-group) discrimination. As can be seen in Table 5.3, individual differences in ambivalence were unrelated to non-personal in-group anti-gay discrimination (all $ps > .27$).

Personal discrimination experienced within the past 12-months. As can be seen in Table 5.3, individual differences in ambivalence were unrelated to anti-gay discrimination experienced in the past 12-months (all $ps > .22$).

Personal discrimination experienced more than 12-months ago. In a multiple regression model, the amount and the direction of ambivalence and their interaction were included as the independent variables. The dependent variable was personally experienced anti-gay discrimination more than 12-months ago. The analysis revealed a marginal main effect of the amount of ambivalence, such that those with high ambivalence reported lower discrimination, $\beta = -.33$, $t(35) = -1.91$, $p = .07$. Furthermore, a main effect of the direction of ambivalence was found, such that those who were more positive towards their SO on the explicit measure relative to the implicit measure reported higher discrimination, $\beta = .64$, $t(35) = 2.22$, $p = .03$. These main effects were qualified by a marginally significant interaction between the amount and the direction of ambivalence, $\beta = -.54$, $t(35) = -1.76$, $p = .09$ (See Figure 5.8). When individuals were more positive towards their SO on the explicit measure relative to the implicit measure, significantly more anti-gay discrimination was reported when the amount of ambivalence was low. This was found when these individuals were compared to those with a high amount of ambivalence in the same directional context ($\beta = -.75$, $t(35) = -2.17$, $p = .04$, $d = .73$), in addition to those who were less positive towards their SO on the explicit measure relative to the implicit measure when the amount of ambivalence was low ($\beta = 1.00$, $t(35) = 2.12$, $p = .04$, $d = .72$).

Figure 5.8 The impact of discrepant explicitly and implicitly measured evaluations towards one's SO on personal anti-gay discrimination. Separate lines represent the amount of ambivalence. The direction of ambivalence is shown on the x-axis.

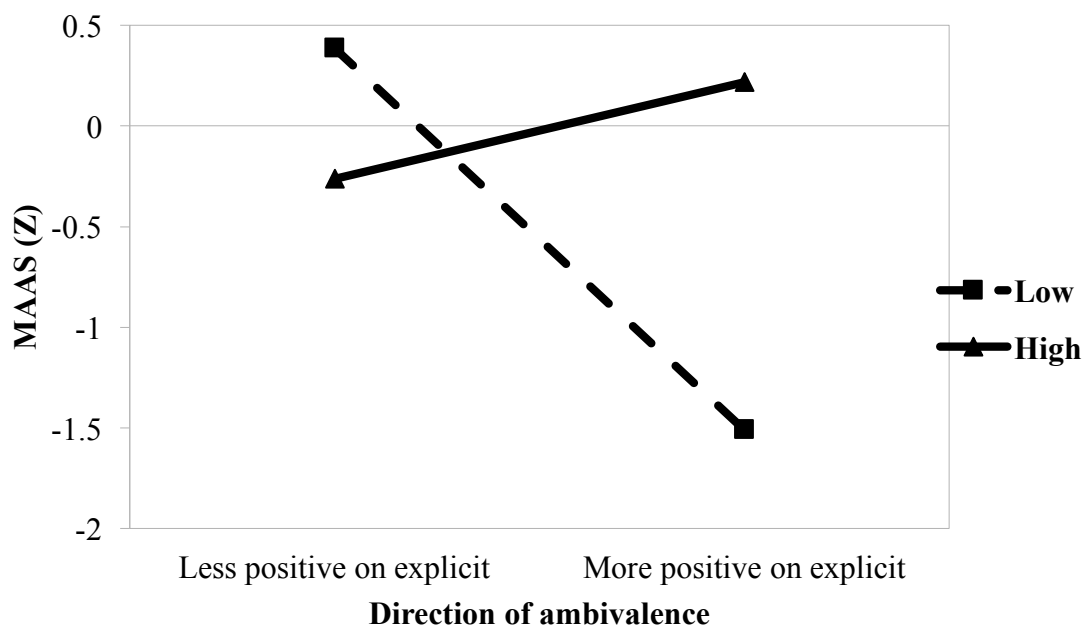


Exploratory Measures

MAAS (mindfulness). In a multiple regression model, the amount and the direction of ambivalence and their interaction were included as the independent variables. The dependent variable was MAAS score. The analysis revealed a significant interaction between the amount and the direction of ambivalence, $\beta = .87$, $t(35) = 3.19$, $p = .003$ (See Figure 5.9). When individuals were more positive towards their SO on the explicit measure relative to the implicit measure, significantly less mindfulness was reported when the amount of ambivalence was low. This was found when these individuals were compared to those with a high amount of ambivalence in the same directional context ($\beta = .86$, $t(35) = 2.71$, $p = .01$, $d = .92$), in addition to those who were less positive towards their on the

explicit measure relative to the implicit measure when the amount of ambivalence was low ($\beta = -.95$, $t(35) = -2.23$, $p = .03$, $d = .75$).

Figure 5.9 The impact of discrepant explicitly and implicitly measured evaluations towards one's SO on MAAS. Separate lines represent the amount of ambivalence. The direction of ambivalence is shown on the x-axis.



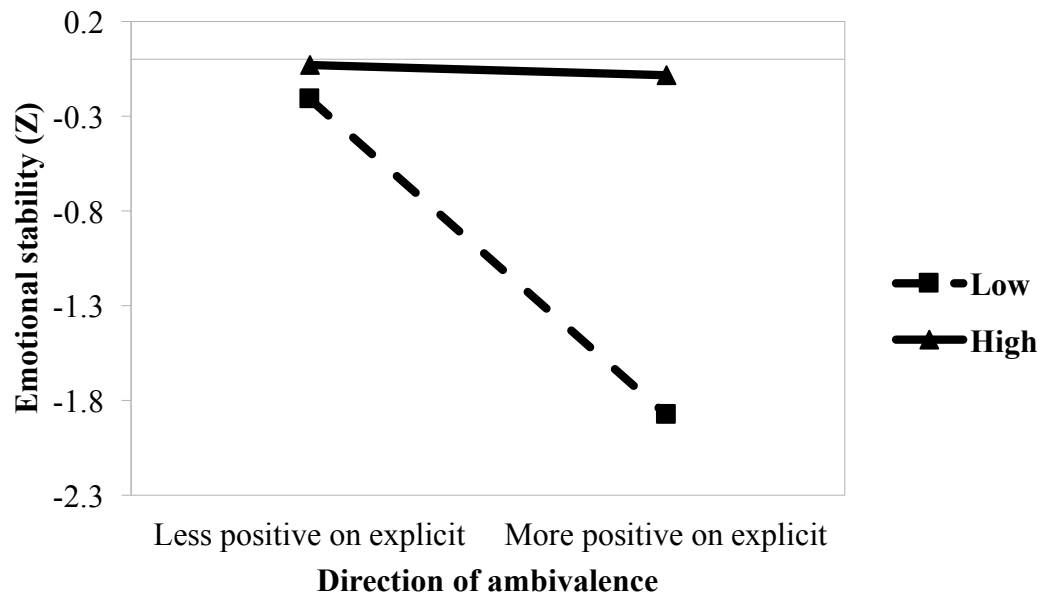
Big-five personality constructs. (1) Extraversion: As can be seen in Table 5.3, individual differences in ambivalence were unrelated to extraversion (all $ps > .20$).

(2) Agreeableness: As can be seen in Table 5.3, individual differences in ambivalence were unrelated to agreeableness (all $ps > .65$).

(3) Conscientiousness: As can be seen in Table 5.3, individual differences in ambivalence were unrelated to conscientiousness (all $ps > .74$).

(4) Emotional stability: In a multiple regression model, the amount and the direction of ambivalence and their interaction were included as the independent variables. The dependent variable was emotional stability score. The analysis revealed a significant main effect of the amount of ambivalence showing discrepant explicit-implicit evaluations towards one's SO to implicate more emotional stability, $\beta = .42$, $t(35) = 2.40$, $p = .02$. This main effect was qualified by a marginal interaction between the amount and the direction of ambivalence, $\beta = .59$, $t(35) = 1.96$, $p = .06$ (See Figure 5.10). When individuals were more positive towards their SO on the explicit measure relative to the implicit measure, less emotional stability was reported when the amount of ambivalence was low. This was found when these individuals were compared to those with a high amount of ambivalence in the same directional context ($\beta = .89$, $t(35) = 2.56$, $p = .01$, $d = .87$), in addition to those who were less positive towards their SO on the explicit measure relative to the implicit measure when the amount of ambivalence was low ($\beta = -.83$, $t(35) = -1.78$, $p = .08$, $d = .60$).

Figure 5.10 The impact of discrepant explicitly and implicitly measured evaluations towards one's SO on Emotional Stability. Separate lines represent the amount of ambivalence. The direction of ambivalence is shown on the x-axis.



(5) Openness to experiences: As can be seen in Table 5.3, individual differences in ambivalence were unrelated to openness to new experiences (all p s > .21).

Table 5.8 Summary of standardised regression coefficients (β) and their significance

	Amount of Ambivalence	Direction of Ambivalence	Amount X Direction
Perfectionism	-.09	.32	-.76*
Actual-Ideal	-.32 ^Δ	.18	-.12
Out-group discrim.	.00	-.22	.16
ESE	.46*	-.53 ^Δ	.49
ISE	.25	-.12	.21
ESE-ISE	.17	-.34	.24
PANAS	.42*	-.45	.71*
Non-personal discrim.	-.02	.24	-.36
Discrim. past 12-months	-.23	.50	-.40
Discrim. > 12-months	-.33*	.64*	-.54
MAAS	.23	-.36	.87**
Extraversion	.24	-.16	.27
Agreeableness	-.05	.15	-.09
Conscientiousness	.00	.08	.11
Emotional stability	.42*	-.43	.59 ^Δ
Openness to new experiences	.24	.01	.13

** $p < .01$ * $p < .05$ ^Δ $p < .08$

I like *and* dislike my sexual orientation: Effects of discrepant explicit-implicit evaluations of one's SO.

A predominate focus of this section was assessing support for hypothesis 5.3 – an association between discrepant explicit-implicit evaluations of one's SO and self-enhancement strategies. Some support for this hypothesis was found. Specifically, individuals with discrepant explicit-implicit evaluations of SO had *smaller* actual-ideal discrepancies. Despite not finding full support for the hypothesis, this section of the thesis uncovered some fascinating and highly convergent findings on the effect of discrepant explicit-implicit evaluations of one's SO.

Taken together, it appears that one group of individuals consistently reported a number of negative psychological outcomes. Specifically, among those who positively evaluated their SO on the explicit measure, but were *somewhat* (i.e., low ambivalence) more negative towards it on the implicit measure, there was low (explicitly measured) self-esteem, and more reported negative affect on the PANAS. Furthermore, these individuals reported being less emotionally stable, and were less mindful. Interestingly, these individuals also reported higher incidence of discrimination on the basis of SO that occurred more than 12-months previously, in addition to higher levels of perfectionist tendencies. A theoretical explanation of these findings is explored in the discussion.

Discussion

The research described in this chapter examined the effects of SO ambivalence and discrepant evaluations of SO in samples of gay-identified individuals. Overall, there were three objectives. To examine the robustness of findings in Study 4, the first aim was to replicate the effects of SO ambivalence on

information processing. The second aim was to investigate whether SO ambivalence *is* linked with a factor associated with minority stress (discrimination on the basis of SO). The final aim was to examine the association between discrepant explicit-implicit evaluations of one's SO and self-enhancement strategies (perfectionism, self-discrepancy, and out-group discrimination). Each of these objectives will now be discussed in turn.

On feeling torn about one's SO: The effects of explicit-implicit SO ambivalence in gay-identified individuals.

Information processing

In Study 5, the effect of SO ambivalence on information processing was examined by measuring response time to explicit questions on sexuality. The results revealed that SO ambivalence impacted the processing of SO-relevant information, but in a way slightly different to that observed in Study 4. In the present research, individuals with greater amounts of ambivalence took longer to complete explicit questions on sexuality, implying deeper processing. Unlike Study 4, this effect was *not* moderated by the direction of SO ambivalence.

The implications of the findings are difficult to explain without conducting further and more expansive research such as a study utilising a non-response time measure of information processing in a sample of gay-identified individuals. Despite this, the results of Studies 4 and 5 present clear evidence that the experience of SO ambivalence in gay-identified individuals *is* associated with the processing of relevant information, however, the precise nature of the association is still slightly unclear.

Minority stress

The second aim of Study 5 was to assess whether the experience of SO ambivalence is associated with minority stress. This was done by investigating the association between SO ambivalence and discrimination on the basis of SO. The study did not find a straightforward association between SO ambivalence and discrimination. Furthermore, and unlike Study 4, an association between SO ambivalence and negative implicitly measured evaluations of one's SO was not found. These findings cast questions that the experience of SO ambivalence *overall* is associated with factors known to result in minority stress.

Despite this, the study revealed that specific individual differences in SO ambivalence were associated with discrimination on the basis of SO. Specifically, among individuals who reported being *less gay* on the explicit measure of SO relative to their responses on the implicit measure, high levels of discrimination were measured when the amount of SO ambivalence was low. This was the case for reports of discrimination directed towards gay-identified individuals within society, in addition to recent personal experiences of discrimination (i.e., that within the past 12-months). As such, is this *specific* combination associated with minority stress? The answer to this question is not straightforward. In particular, research has shown that minority stress is associated with poor psychological health (e.g., Hatzenbuehler et al., 2009; 2011; Meyer, 2003). However, Study 5 did not reveal any evidence suggesting that this specific profile of SO ambivalence implicates relatively poorer psychological health.

Nonetheless, Heatherton, Kleck, Hebl, and Hull (2000) argue that researchers often make the mistake of assuming that stigma necessarily translates into mental health outcomes. For instance, in a review of the literature, Crocker

and Major (1989) found that stigmatised individuals did not differ in self-esteem when compared to non-stigmatised individuals. This was true when comparing Black and White individuals, women and men, disabled and non-disabled, and importantly, gay-identified individuals and straight-identified individuals. Instead, Crocker and Major proposed that stigma relates to psychological health *only* when an individual lacks the resources to cope (for an overview see Heatherton et al., 2000).

Interestingly, the same individuals (i.e., those who reported higher levels of discrimination) also had significantly higher levels of extraversion and agreeableness. Past research has demonstrated that both of these personality constructs implicate positive outcomes for psychological health and functioning (e.g., happiness, stability in adult life; see Hayes & Joseph, 2003; Laursen et al., 2002). As such, it could be the case that this specific kind of SO ambivalence *is* associated with minority stress, however, a degree of psychological resiliency (as a result of extraversion and agreeableness) could mitigate any resulting detriment. As such, future research should examine whether this specific profile of SO ambivalence among gay-identified individuals is associated with a dispositional resiliency to stress.

Outgroup discrimination

The results also revealed an unexpected finding linking the experience of SO ambivalence to out-group discrimination. Specifically, higher levels of out-group discrimination were observed among those who reported being *more gay* on the explicit measure of SO relative to their response on the implicit measure. This finding relates to past research on self-esteem, which has found the same direction of explicit-implicit ambivalence (i.e., $E > I$) to result in out-group discrimination.

Namely, higher levels of discrimination (including racism) have been observed when individuals simultaneously report high self-esteem while scoring low on an implicit measure of self-esteem – something that has been explained to be a consequence of the *defensive* nature of the explicit-implicit discrepancy (Jordan et al., 2003; 2005). As such, this finding could represent the *defensive* nature of this direction of SO ambivalence, and the self-enhancement strategies that this consequentially entails.

I like *and* dislike my sexual orientation: Effects of discrepant explicit-implicit evaluations of one's SO.

The final aim of Study 5 was to investigate the association between discrepant explicit-implicit evaluations of one's SO and perfectionism, actual-ideal discrepancy, and out-group discrimination. The study found that those with discrepant explicit-implicit evaluations of their SO had smaller actual-ideal discrepancies, implying compensatory self-enhancement activity (Bosson et al., 2003; Haddock & Gebauer, 2011). However, clear support linking discrepant explicit-implicit evaluations with perfectionism and out-group discrimination was not found. Despite this, the research uncovered highly convergent findings on the effect of discrepant explicit-implicit evaluations of one's SO.

In particular, negative outcomes for psychological well-being and functioning were consistently found among those who positively evaluated their SO on the explicit measure whilst being *somewhat* (i.e., low ambivalence) more negative towards it on the implicit measure. These outcomes included low self-esteem, higher levels of negative affect, low mindfulness, and low emotional stability. Interestingly, these individuals also reported higher levels of perfectionist

tendencies in addition to higher incidence of discrimination on the basis of SO (but only for that which occurred more than 12-months ago).

What can be made of these findings? While more research would be needed to investigate their generalisability, *three* positions advocate that the findings may represent a group of individuals who experience *stigma* of being gay.

First, it is clear that this profile of ambivalence – those who positively evaluated their SO on the explicit measure whilst being *somewhat* (i.e., low ambivalence) more negative towards it on the implicit measure – is linked with a number of *coping strategies* designed to dispel stigma related stress. As a starting point, in order to defend against internalised negative feelings (i.e., feelings of shame detected by implicitly measured evaluations of SO), positive self-reported evaluations towards one's SO are adopted. This finding is analogous to that observed in the self-esteem literature, where individuals can defend the self against negative implicitly measured self-perceptions by adopting *positive* explicitly measured evaluations of self-worth (e.g., Jordan et al., 2003; 2005). In addition, this particular profile of ambivalence was associated with higher perfectionist tendencies. This can be interpreted to reflect a *problem-focused* method of coping (e.g., Folkman, Lazarus, Gruen, & DeLongis, 1986; Luce et al., 1997). Specifically, research has demonstrated that stigmatised groups, including gay-identified individuals, have heightened awareness of the impact their stigmatised identity has on interpersonal interactions (Pinel, 1999). As such, perfectionism could reflect attempts to improve aspects of the self, mitigating problems that may arise when interacting with individuals who could potentially discriminate. In an experimental example of stigmatised individuals' motivation to inflate aspects of the self to mitigate prejudice, Miller, Rothblum, Felicio, and Brand

(1995) asked obese (i.e., a stigmatised group) and non-obese women (i.e., a non-stigmatised group) to have a telephone conversation with another person. When conversation partners were visible to each other, obese women rated themselves as more likeable and socially skilled when compared to non-obese women. Furthermore, in the context of visibility, conversation partners rated obese women's social skills negatively (demonstrating prejudice). Interestingly, when conversation partners could not see each other, both of these findings were not found. This study shows that stigmatised groups have the propensity to inflate aspects of self when expecting prejudice in order to rebuff its negative effects. As such, it is possible that perfectionism acts in a similar way for those who have internalised stigma of being gay.

Second, this profile of ambivalence – those who positively evaluated their SO on the explicit measure whilst being *somewhat* (i.e., low ambivalence) more negative towards it on the implicit measure – was found to be associated with higher perceptions of discrimination on the basis of SO (that which occurred more than 12-months ago). As described previously, discrimination on the basis of SO is a factor known to result in minority stress, something that has severely negative effects for psychological well-being (Hatzenbuehler et al., 2011; Meyer, 1995, 2003). On account of its negative psychological effects, it is understandable that the experience of discrimination could result in an *internalised* dislike of sexual orientation (i.e., discrimination on the basis of my SO makes me feel bad, therefore I dislike my SO). However, the interpretation that discrimination is an antecedent of stigma related stress should be treated with caution. For instance, the effect was not found for recent reports of discrimination in addition to discrimination directed towards gay individuals more generally (i.e., group-level discrimination).

Furthermore, the finding is at odds with research showing that stigmatised individuals generally report higher levels of group-level discrimination relative to personally felt discrimination (i.e., a personal-group discrimination discrepancy; Taylor, Wright, Moghaddam, & Lalonde, 1990). Despite this, other research demonstrates that stigmatised individuals are likely to deny or minimise reports of discrimination in order to minimise its psychological effects (for an overview see Heatherton et al., 2000). In other words, reports of discrimination, or lack thereof, could be a consequence of stigma. As such, amongst those with this profile of ambivalence, it is plausible that reports of discrimination could either be an antecedent or consequence of stigma. This provides an interesting topic for future research to explore.

Third, the finding that this profile of ambivalence – those who positively evaluated their SO on the explicit measure whilst being *somewhat* (i.e., low ambivalence) more negative towards it on the implicit measure – is associated with an array of negative psychological outcomes is convergent with literature showing the negative effects of internalised anti-gay stigma. For example, Hatzenbuehler et al. (2009) found that negative implicitly measured evaluations of SO among sexual minorities implicated a hindered capacity to regulate emotion (e.g., higher rumination and suppression) in addition to psychological distress. Similarly, in a meta-analysis of 31 studies, Newcomb and Mustanski (2010) found a convincing link between the experience of internalised stigma and symptoms of depression and anxiety. Further support suggesting that stigma is the root of the negative outcomes experienced by those with this profile of ambivalence comes from research that has investigated the link between stigma and self-esteem. As described previously, the experience of stigma has not always been found to

implicate poor psychological health, in the form of low self-esteem (Crocker & Major, 1989; Heatherton et al., 2000). However, when an associative link *does* exist, some have argued that this demonstrates an individual's *acceptance* of negative societal attitudes towards their stigmatised identity. In one example, Chassin and Stager (1984) measured self-esteem in a sample of incarcerated youth criminals (i.e., a stigmatised group). Among those who were aware of negative societal views towards incarcerated youth criminals, there was significantly lower self-esteem. As such, the finding of low self-esteem amongst those with this profile of ambivalence provides further support that these individuals have internalised negative societal views towards their stigmatised identity.

On the basis of the above, there is support that those who positively evaluated their SO on the explicit measure whilst being *somewhat* (i.e., low ambivalence) more negative towards it on the implicit measure experience stigma of being gay. However, one question still remains, *why* are the effects of this more profound amongst those with *low amounts* of ambivalence? Interestingly, this finding adds to an accumulation of evidence presented throughout this thesis that individuals with low amounts of ambivalence experience psychological outcomes that would often only be expected amongst those with high amounts of ambivalence. One possible explanation could be greater overspill between explicit and implicitly measured evaluations amongst those with low ambivalence. In the context of the present research, this could have the effect of individuals being more aware, or accepting, of internalised anti-gay stigma.¹⁹

¹⁹ When examining the association between explicitly and implicitly measured evaluations of SO as a function of the amount of ambivalence, there is greater overlap between these measures amongst those with low ambivalence ($r = .64, p = .002$), when compared to those with high ambivalence ($r = -.42, p = .09$). These analyses are based on a median split, and

CHAPTER SIX:

FEELING TORN AND SEEING TORN – AN INITIAL INVESTIGATION OF THE WIDER EFFECTS OF SEXUAL ORIENTATION AMBIVALENCE

Overview of Chapter

This chapter describes a study that sought to investigate the wider impact of explicit-implicit SO ambivalence. In a sample of straight-identified individuals, the study considered whether information relevant to the experience of explicit-implicit SO ambivalence is communicated non-verbally, and whether one's own experience of SO ambivalence influences the ability to detect this non-verbal information linked with SO ambivalence. In the study, participants saw 139 handwriting samples, each written by a different straight-identified target, who themselves had completed explicit and implicit measures of SO. Participants judged the SO of each target and how torn they believed each target felt towards their SO. Participants also completed explicit and implicit measures of SO. Overall, targets that reported more same-sex attraction and interest were more likely to be perceived as gay. These same targets were also perceived to feel more torn towards their SO. The results also revealed that participants with high amounts of SO ambivalence had unique insights into targets' SO ambivalence. Furthermore, an interaction between participants' amount and direction of SO ambivalence also impacted social perception judgements. This interaction revealed an enhanced ability to detect others' SO ambivalence among participants who reported being more straight on the explicit measure of SO relative to the implicit measure *when* the amount of SO ambivalence was low.

do not discriminate on the basis of directionality; they are cited here purely to illustrate the general phenomenon of low explicit-implicit ambivalence.

Introduction

The work described in this thesis has shown explicit-implicit sexual orientation ambivalence to have important consequences in both straight- and gay-identified individuals. In Studies 1 through 3, the research produced a number of robust effects showing that straight-identified individuals with high amounts of SO ambivalence engaged in deeper processing of SO-relevant information. This is comparable to past work on the effects of explicit-implicit ambivalence (e.g., Briñol et al., 2006). However, the research described in Studies 1 through 3 differed from past work on account of an interaction between the amount of SO ambivalence and the direction of SO ambivalence. Across the studies, when straight-identified individuals reported being *less straight* on the explicit measure relative to their response on the implicit measure, those with high ambivalence engaged in deeper processing of SO-relevant information than those with low ambivalence. However, when straight-identified individuals reported being *more straight* on the explicit measure relative to their response on the implicit measure, those with high *and* low amounts of ambivalence engaged in equally deep processing of SO-relevant information.

In Studies 4 and 5, among gay-identified individuals, SO ambivalence also impacted the processing of SO-relevant information but in ways different to those observed in straight-identified individuals. In Study 4 an interaction between the amount and the direction of SO ambivalence impacted processing, showing deeper processing among those who reported being more gay on the explicit measure of SO relative to the implicit measure *when* the amount of SO ambivalence was high. In Study 5, only those with high amounts of SO ambivalence engaged in deeper processing.

Taken together, these findings illustrate the influence of SO ambivalence on the processing of information that is relevant to sexual orientation in both straight- and gay-identified individuals. The research in this final empirical chapter describes a study that extends this in a novel way by investigating whether SO ambivalence relates to the processing of relevant *non-verbal* information in a sample of *straight-identified individuals*.

Non-verbal communication of SO ambivalence

Previous research has demonstrated that ambivalence impacts non-verbal communication via the face. Griffin and Sayette (2008) coded smokers' facial expressions whilst they were exposed to smoking cues (e.g., a packet of cigarettes) after a period of abstinence. When smokers experienced ambivalence between (a) their inabilities to refrain from smoking and (b) their strong intentions to quit, there was simultaneous activation of positive and negative facial expressions in response to smoking cues. In other words, when individuals experienced ambivalence, this resulted in facial expressions consistent with the nature of ambivalence (i.e., the simultaneous experience of positive and negative feelings). In another example, Heisel and Mongrain (2004) studied the effect of ambivalence over emotion on facial expressions – this refers to an emotional ambivalence whereby individuals feel compelled to express socially desirable emotions and inhibit the expression of less socially desirable emotions (e.g., King, 1998). In the study, couples listed common areas of disagreement in their relationship (e.g., financial, communication, friends, family, etc.). Subsequently, they were asked to resolve the issue ranked highest whilst their facial expressions were recorded. The study found emotional ambivalence to result in a greater number of negative facial expressions and fewer positive facial expressions – effects that remained

significant when the researchers controlled for current mood states. Taken together, this research demonstrates that the experience of ambivalence can result in outward non-verbal and expressive changes via the face. As such, it is plausible that information relevant to explicit-implicit SO ambivalence could also be communicated non-verbally.

To the extent that information relevant to SO ambivalence is communicated non-verbally, it is possible that the perception of such information could be moderated by an individual's own SO ambivalence. Consistent with this possibility is research demonstrating that the accurate perception of non-verbal information is moderated by relevant self-evaluations. For example, Wilson and Rule (2014) presented participants with images of liberal and conservative university students' faces, and participants were asked to rate each face with respect to a number of traits including dominance, facial maturity, likeability and trustworthiness. When participants expressed conservative values, conservative students' faces were perceived as more likeable and trustworthy. In explaining this effect, Wilson and Rule (2014) showed that the effect diminished when controlling for the extent to which a target face "looked conservative." As such, self-evaluations (e.g., particular attitudes and beliefs; "I am a conservative") enhance the ability to detect non-verbal information that is relevant to one's self-evaluation, impacting subsequent social perception judgements. On this basis, it is plausible that other self-evaluations, such as explicit-implicit SO ambivalence, could influence the ability to perceive non-verbal information relevant to SO ambivalence.

Why might participants with SO ambivalence have an enhanced ability to perceive SO-relevant non-verbal information? On the basis of the research described throughout this thesis in addition to other work on ambivalence (e.g.,

Briñol et al., 2006; Maio et al., 1996), we know that the experience of ambivalence is associated with deeper processing of relevant information. As such, any increased propensity to perceive relevant non-verbal information among those with explicit-implicit SO ambivalence could further illustrate preoccupation with SO-relevant information.

To investigate whether information relevant to the experience of explicit-implicit SO ambivalence is communicated non-verbally, and whether one's own experience of SO ambivalence moderates the ability to detect this information, the research described in this chapter asked participants to make social perception judgements based on small samples of handwriting that were offered by different targets. The rationale for this approach stems from presently unpublished raw data of Rule's (2015) showing that people have the ability to detect others' SO on the basis of handwriting. In one study, participants were shown scanned images of 71 identical sentences that read "Psychology is the study of mind and behaviour in relation to a particular field of knowledge or activity." Each sentence was written by a different target person (all were males and 29 self-identified as gay). In response to each image, participants indicated whether they believed the target to be straight or gay. The results revealed that participants were able to identify straight and gay men at levels significantly greater than chance. Two further studies confirmed the robustness of this effect by replicating it with different stimuli. In one study, the presented stimuli were identical images of the letter "e," and in the second, the content of each handwriting sample differed. Taken together, these results show that people are able to detect SO-relevant non-verbal information via small samples of handwriting. As such, this makes samples of handwriting a possible tool to investigate sensitivity to SO-relevant non-verbal

information among those with individual differences in explicit-implicit SO ambivalence.

Other research further demonstrates how small amounts of visual information can influence perception processes. In one study, Rule, Ambady, Adams, and Macrae (2008) presented participants with images of 81 male target faces (45 were photos of gay-identified men), and participants were simply asked to categorise the target's SO. Participants detected SO with accuracy that was significantly greater than chance guessing. In a subsequent study, Rule et al. (2008) presented other participants with the same images, altered to show only the hair, eyes (excluding brows), and mouth, or images with all of these features removed. Participants again detected SO significantly better than chance from the hair, eyes, and mouth (but not without these features). These findings were also replicated when using female targets (Rule, Ambady, & Hallet, 2009). As such, this research demonstrates the strength of using faces when investigating sensitivity to SO-relevant non-verbal information. However, given the preliminary nature of the work described in this chapter it was impractical to collect images of faces. Furthermore, the use of faces would have posed ethical concerns that could only be avoided by collecting the images elsewhere (e.g., participants could be asked to form judgements of known peers). Moreover, the effects described in Rule's work on the detection of SO from handwriting samples are relatively subtle compared to the effects described in his work on the detection of SO from the face.²⁰ As such, to the extent that information relevant to SO ambivalence is communicated non-

²⁰ The data in Rule's (2011) handwriting study were analysed using signal detection theory. This resulted in a non-parametric signal detection statistic (A'), with a higher A' reflecting greater accuracy. Across the handwriting studies the $MA' = .59$ (ranging between .56-.65). In Rule et al. (2009), the ability (A') to detect SO from the whole face equalled .64. As such, in two of the three handwriting studies, the effects were subtle relative to those found with faces.

verbally via handwriting, this will provide strong support for future work that investigates non-verbal communication of information relevant to SO ambivalence via the face.

To summarise, the research described above highlights the very few examples showing that ambivalence can be communicated non-verbally (Griffin and Sayette, 2008; Heisel & Mongrain, 2004). Furthermore, research has also demonstrated the moderating influence of self-relevant evaluations on the perception of relevant non-verbal information (Wilson & Rule, 2014). On the basis of this research it is plausible that one's experience of SO ambivalence could be communicated non-verbally, and that individual differences in SO ambivalence could moderate the accuracy of detecting others with SO ambivalence. These ideas are tested in a study with straight-identified participants *and* targets, with the following hypotheses made:

Hypothesis 6.1 To the extent that information relevant SO ambivalence is non-verbally communicated via handwriting, and that such information is perceived, targets with explicit-implicit SO ambivalence will be perceived as feeling more torn towards their sexuality.

Hypothesis 6.2 In line with the findings reported in Studies 1 through 3, there will be a main effect of the amount of ambivalence on sensitivity to others' explicit-implicit SO ambivalence.

Hypothesis 6.3 In line with the findings reported in Studies 1 through 3, this main effect will be qualified by an interaction between the amount and

the direction of explicit-implicit SO ambivalence. The pattern of this interaction would follow those obtained in Studies 1 through 3.

STUDY 6

Method

Participants

Sixty-eight Cardiff University psychology undergraduate students participated for course credit (7 males; $M_{\text{age}} = 20.11$ years, $SD = 2.61$ years). Fifty-six participants self-identified as straight, two identified as gay, nine identified as bisexual, and one identified as pansexual. The sample size is appropriate given the number of predictor variables used in this study (Gpower; Faul et al., 2007).²¹

Materials

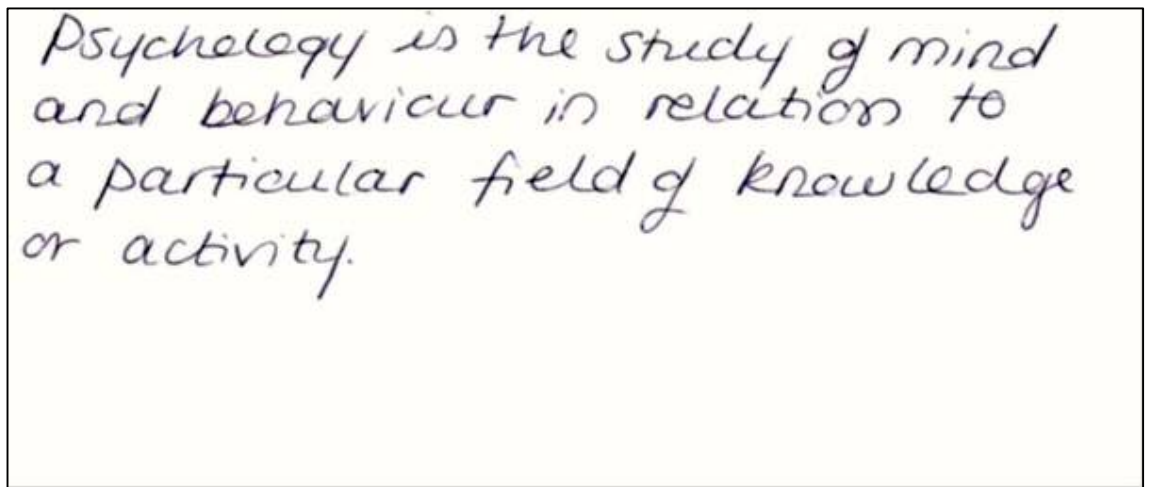
Sexual orientation and SO ambivalence. The study used the same explicit and implicit measures of SO used throughout this thesis. SO ambivalence was conceptualised in terms of individual differences in the amount of explicit-implicit discrepancy (the absolute difference between the standardized scores on the explicit and implicit measures of SO) and the direction of the discrepancy (dummy code of +1 or -1 according to the valence of the non-absolute difference between the standardized scores on the explicit and implicit measures of SO).

Stimuli. In a previous study, 139 straight-identified Cardiff University Psychology Undergraduates (126 females; 13 male; $M_{\text{age}} = 20.14$ years) hand wrote “Psychology is the study of mind and behaviour in relation to a particular field of

²¹ All subsequent analyses report data from participants who identified as straight. This is because the research forms the hypothesis that enhanced sensitivity to relevant non-verbal information reflects an attempt to resolve the ambivalence; given the robust and convergent effects between SO ambivalence and information processing among straight-identified individuals, the study of this group of individuals alone permitted more specific hypotheses. Despite this, when all participants are included in the analysis all patterns of results remain the same, showing that the removal of sexual minorities has low impact.

knowledge or activity.” Each sample was scanned and measured 15cm in length and 6.5cm in height (see Figure 6.1 for an example). In the previous study targets completed the explicit and implicit measures of SO in addition to a number of other measures not relevant to the present discussion.

Figure 6.1 Handwriting sample example.



Procedure

The study was conducted using DirectRT (Jarvis, 2008). Participants completed two social perception tasks. In the first task, participants were not given any information about the targets; they were simply shown each handwriting sample and were asked to indicate the targets’ sexual orientation using a scale from 1 (= gay) to 8 (= straight). In the second task, participants were told that “some people can be said to feel torn towards their sexual orientation. For example, some individuals might report being straight, despite some feelings towards same-sex individuals.” Participants were subsequently told that all of the targets were written by people who identified as straight; they were then shown all of the images again, and were asked to indicate how torn they believed the

target felt towards their sexual orientation using a scale from 1 (= not very torn) to 8 (= very torn). For both social perception tasks, participants were asked to go by their “gut instinct.” At the end of the study, participants completed the explicit and implicit measures of sexual orientation.

Results

The results are divided into two sections. The first section provides descriptive statistics on participants’ overall sensitivity to relevant non-verbal information, whilst the second section reports analyses showing the moderating influence of participants’ SO ambivalence on sensitivity to relevant non-verbal information.

Sensitivity to targets’ SO

Analytic strategy. Sensitivity to non-verbal SO-relevant information was investigated by calculating within-subject correlations (see Rule et al., 2008). In particular, correlations were computed between participants’ judgements and targets’ explicitly measured SO²² and implicitly measured SO. The resulting r values were converted to Fisher’s Z scores,²³ and t-tests were used to calculate the statistical difference from zero. As such, chance guessing would represent no discernible difference between Z scores and zero.

Sensitivity to explicitly and implicitly measured SO. The correspondence between participants’ judgements and the SO of targets’ is detailed in Table 6.1. Overall, the association between participants’ judgements

²² As can be seen below, explicit SO is addressed by looking at targets’ responses on the opposite- and same-sex items separately. From the results it is clear that participants were better able to perceive “markers” of same-sex attraction and interest relative to opposite-sex attraction and interest. The analysis using the composite of these scores does not show this specialised ability.

²³ Fisher’s $Z = \frac{1}{2} * \log_e[(1 + r) / (1 - r)]$

and targets' self-reported opposite-sex attraction and implicitly measured SO did not differ from zero, indicating chance guessing (all $ps > .22$).

The association between participants' judgements of a targets' SO negatively correlated ($r = -.03, p < .01$) with targets' self-reported same-sex attraction and interest, a value that was significantly different from zero $t(55) = -3.271, p = .002, 95\% \text{ CI } [-.053, -.013]$. This shows that when targets reported higher levels of same-sex attraction, the targets' SO was perceived by participants as more gay. Interestingly, this effect corroborated with participants' torn judgements. Here, when targets self-reported same-sex attraction and interest, they were perceived as being more torn towards their SO. The respective correlation ($r = .03, p < .05$) was also significantly different from zero, $t(55) = 2.139, p = .037, 95\% \text{ CI } [.002, .051]$. These findings imply that when straight-identified targets self-report same-sex attraction, this appears to be transmitted via handwriting, impacting perceivers' social perception judgements.

Table 6.1 Fisher's Z scores detailing the association between participants' social perception judgements and targets' SO.

	Targets' same-sex attraction	Targets' opposite-sex attraction	Targets' implicitly measured SO
Participants' SO judgement	-.03**	-.01	.00
Participants' torn judgement	.03*	.00	.01

** $p < .01$, * $p < .05$

Sensitivity to targets' ambivalence

Analytic strategy. Sensitivity to non-verbal information relevant to a torn sexual identity was investigated by calculating within-subject correlations. In particular, associations were computed between participants' judgements and targets' SO *ambivalence*. On the basis of the results described in the previous section – judgements were linked to targets' same-sex attraction and interest but not opposite-sex attraction and interest – as an exploratory exercise, associations between participants' social perception judgements and targets' *explicit* SO ambivalence were calculated.

Sensitivity to explicit-implicit SO ambivalence. The analysis revealed no correspondence between participants' judgements and targets' experience of explicit-implicit SO ambivalence (all $ps > .19$; see Table 6.2). As such, support for hypothesis 6.1 was not found.

Sensitivity to explicit SO ambivalence. As an exploratory exercise, explicit SO ambivalence was derived using The Griffin Index (Thompson et al., 1995).²⁴ This index calculates similarity in reports of opposite- and same-sex attraction and interest plus the intensity of the similarity. Overall, the associations between participants' judgements and explicit SO ambivalence showed some interesting effects (see Table 6.2). First, targets with higher levels of explicit SO ambivalence were perceived as more gay ($r = -.03, p < .01$), a value that was significantly different from zero, $t(55) = -2.733, p = .008, 95\% \text{ CI } [-.049, -.008]$. Second, targets with higher levels of explicit SO ambivalence were perceived as more torn ($r = .02$,

²⁴ Explicit SO ambivalence was calculated using The Griffin Index (Thompson et al., 1995):

$$\begin{aligned} \text{Ambivalence} &= (\text{positive} + \text{negative})/2 - |\text{positive} - \text{negative}| \\ &= (\text{opposite-sex} + \text{same-sex})/2 - |\text{opposite-sex} - \text{same-sex}| \end{aligned}$$

$p < .05$), a value that was also significantly different from zero, $t(55) = 2.081$, $p = .042$, 95% CI [.001, .050]. These findings imply that explicit SO ambivalence is transmitted via handwriting, something that affects social perception judgements.

Table 6.2 Fisher's Z scores detailing the association between participants' social perception judgements and targets' SO ambivalence.

	Targets' implicit SO ambivalence		Targets' Explicit SO
	Amount	Direction	Ambivalence
Participants' SO judgement	.00	.01	-.03**
Participants torn judgement	.00	-.01	.02*

** $p < .01$, * $p < .05$

Summary – Sensitivity to information relevant to SO and SO ambivalence

The results described in this section established participants' ability to detect the SO of targets, in addition to whether participants could detect how torn targets felt towards their SO.

In all, participants were not sensitive to targets' opposite-sex attraction and interest as well as targets' implicitly measured SO. However, participants were sensitive to targets' same-sex attraction and interest. Specifically, targets that reported more same-sex attraction and interest were perceived as more gay. Interestingly, these same targets were also perceived to feel more torn towards their sexual orientation.

The results also established that participants were not sensitive to targets' experience of explicit-implicit SO ambivalence. However, they were sensitive to an explicitly measured discrepancy between targets' reports of same-sex attraction and interest and reports of opposite-sex attraction and interest. In particular, targets with higher amounts of explicit ambivalence were perceived as more gay and more torn.

Feeling torn and seeing torn: The moderating influence of *participants'* SO ambivalence on judgements of targets' sexuality

Analytic strategy. To investigate whether participants' own SO ambivalence moderated perception judgements, a series of multiple regression analyses were conducted. In these analyses, the independent variables were always the participants' amount of SO ambivalence, direction of SO ambivalence, and the interaction between the amount and direction of SO ambivalence. The respective Fisher's Z score was included as the dependent variable (see Table 6.3 for a summary of the analyses reported below).

Sensitivity to targets' SO. A main effect of the amount of SO ambivalence (i.e., that of the participant) marginally impacted the association between torn judgements and targets' self-reported same-sex attraction and interest, $\beta = .278$, $t(52) = 1.896$, $p = .064$, 95% CI $[-.001, .051]$. In other words, when participants had high levels of SO ambivalence, they were more likely to perceive targets as torn when the target expressed same-sex attraction.

In addition, a main effect of the amount of SO ambivalence (i.e., that of the participant) impacted the association between participants' SO judgements and targets' implicitly measured SO, $\beta = .309$, $t(52) = 2.154$, $p = .036$, 95% CI $[-.002, .059]$. In other words, when participants had high levels of SO ambivalence, they

were more likely to perceive targets as gay when the target was relative more gay on the implicit measure of SO.

In addition to these findings, the direction of ambivalence marginally moderated the association between participants' SO judgements and targets' self-reported same-sex attraction and interest, $\beta = -.321$, $t(52) = -1.72$, $p = .091$, 95% CI $[-.052, .004]$. This suggests that participants who were more straight on the explicit measure of SO relative to their score on the implicit measure perceived targets as more gay when the target self-reported more same-sex attraction.

Table 6.3 Summary of standardised regression coefficients (β) and their significance. Rows refer to specific Fisher Z score dependent variables; columns refer to individual differences in participants' SO ambivalence.

	Amount of SO ambivalence	Direction of SO ambivalence	Amount X Direction
SO judgement, target same-sex attraction	.03	-.32 ^Δ	.27
Torn judgement, target same-sex attraction	.28 [†]	-.20	.19
SO judgement, target opposite-sex attraction	.10	-.06	-.07
Torn judgement, target opposite-sex attraction	.05	.06	-.16
SO judgement, target implicit SO	.31*	.06	.19
Torn judgement, target implicit SO	-.04	-.27	.18

* $p < .05$, $†p < .07$, $Δp \leq .09$

Sensitivity to targets' ambivalence. For ease, the results are considered with reference to a number of relevant headings (see Table 6.4 for a table displaying all correlation coefficients).

The association between participants' judgements of torn and targets' amount of SO ambivalence. In line with hypothesis 6.2, the amount of a participant's explicit-implicit ambivalence marginally impacted the association between their judgements of torn and a targets' amount of ambivalence, $\beta = .25$, $t(52) = 1.717$, $p = .092$, 95% CI [-.003, .043]. In other words, when participants had

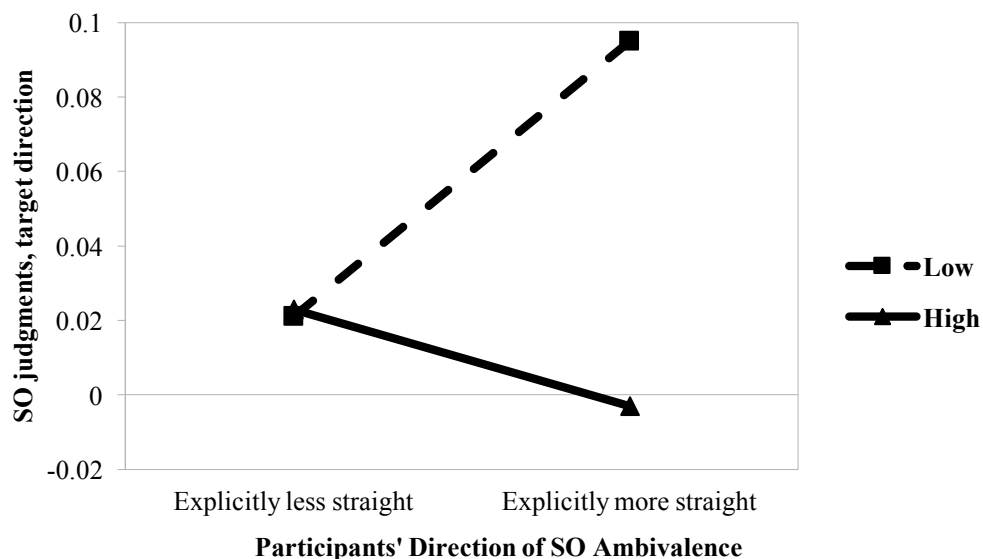
high levels of SO ambivalence, they were more sensitive to discerning targets with high amounts of SO ambivalence.

The association between participants' judgements of SO and targets' direction of SO ambivalence. In line with hypothesis 6.2, the amount of a participant's explicit-implicit ambivalence impacted the relationship between their judgements of targets' sexual orientation and targets' direction of SO ambivalence, $\beta = -.33$, $t(64) = -2.318$, $p = .024$, 95% CI $[-.045, -.003]$. This implies that high ambivalence impacted the association between perceptions of SO and targets' direction of SO ambivalence. This effect has two consequences. First, when targets reported being more straight on the explicit measure of SO relative to the score on the implicit measure, participants with high amounts of ambivalence perceived these targets as more gay. Second, when targets reported being less straight on the explicit measure of SO relative to the score on the implicit measure, participants with high amounts of ambivalence perceived these targets as more straight.

This main effect was qualified by a significant amount by direction interaction. However, the precise pattern of this interaction did not support hypothesis 6.3, $\beta = -.45$, $t(52) = -2.376$, $p = .021$, 95% CI $[-.045, -.004]$ (see Figure 6.2). The interaction revealed that, when participants reported being more straight on the explicit measure of SO relative to their score on the implicit measure, those with low ambivalence perceived targets as straight when the target had the same direction of ambivalence, $\beta = -.049$, $t(52) = -2.829$, $p = .007$, $d = .78$. This same effect showed that, when participants reported being more straight on the explicit measure of SO relative to their score on the implicit measure, those with high ambivalence perceived targets as straight when the target expressed being less straight on the explicit measure relative to their score on the implicit measure.

For participants who reported being less straight on the explicit measure of SO relative to their score on the implicit measure, the amount of ambivalence did not moderate the respective social perception judgement, $\beta = .001$, $t(52) < 1$.

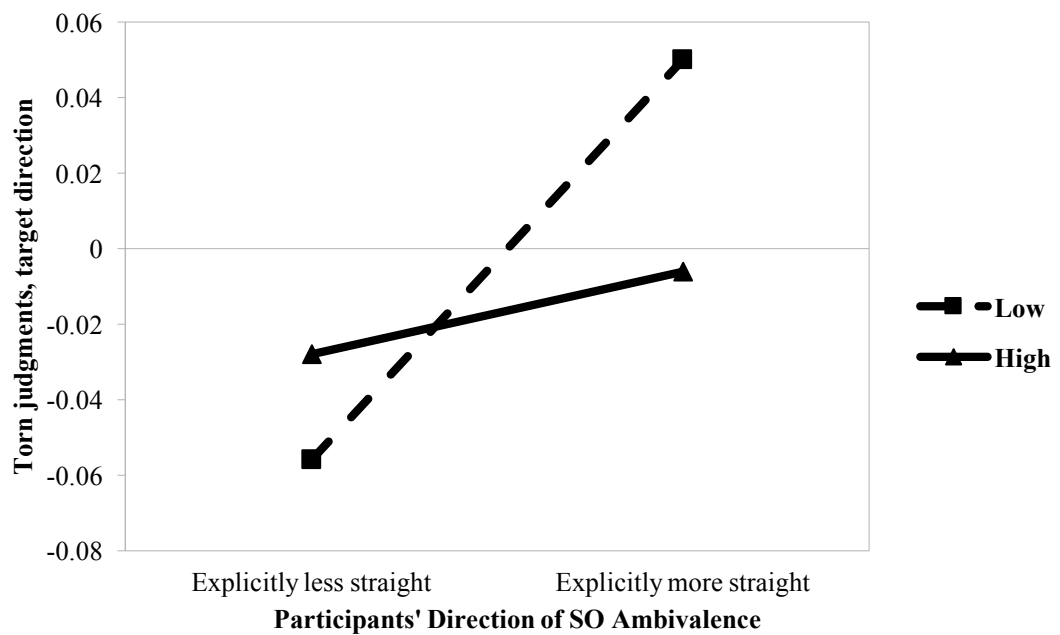
Figure 6.2 The moderating influence of participants' SO ambivalence (separate lines show the amount of SO ambivalence; the direction of SO ambivalence is shown on the x-axis) on the association between judgements of SO and targets' direction of ambivalence.



The association between participants' judgements of torn and targets' direction of SO ambivalence. The direction of a participant's SO ambivalence impacted the association between their judgements of torn and targets' direction of SO ambivalence, $\beta = .39$, $t(52) = 2.106$, $p = .040$, 95% CI [.002, .063]. This suggests that participants who reported being more straight on the explicit measure of SO relative to the implicit measure perceived targets with the same direction of ambivalence as more torn.

This main effect was qualified by a marginal interaction between the amount and the direction of participants' SO ambivalence, $\beta = -.34$, $t(52) = -1.754$, $p = .085$, 95% CI $[-.044, .003]$ (see Figure 6.3). This interaction did not follow the pattern of results predicted by hypothesis 6.3; instead, it revealed a pattern of results somewhat consistent with that described above.

Figure 6.3 The moderating influence of participants' SO ambivalence (separate lines show the amount of SO ambivalence; the direction of SO ambivalence is shown on the x-axis) on the association between judgements of torn and targets' direction of ambivalence.



The association between participants' judgements of torn and targets' explicit ambivalence. The amount of a participant's ambivalence had a marginal impact on the association between their judgements of torn and targets' explicit SO ambivalence, $\beta = .26$, $t(52) = 1.747$, $p = .087$, 95% CI $[-.003, .049]$. This suggests

that participants with greater explicit-implicit SO ambivalence have somewhat better insight into the explicit SO ambivalence of others.

Table 6.4 Summary of standardised regression coefficients (β) and their significance. Rows refer to specific Fisher Z score dependent variables; columns refer to individual differences in participants' SO ambivalence.

	Amount of SO ambivalence	Direction of SO ambivalence	Amount X Direction
SO judgement, target amount	-.17	-.15	-.24
Torn judgement, target amount	.25 ^Δ	-.01	.12
SO judgement, target direction	-.33*	.16	-.45*
Torn judgement, target direction	-.09	.39*	-.34 ^Δ
SO judgement, target explicit ambivalence	.06	-.28	.27
Torn judgement, target explicit ambivalence	.26 ^Δ	-.20	.21

* $p < .05$, ^Δ $p \leq .09$

Summary – The moderating role of a participant’s SO ambivalence on social perception judgements

The results described in this section had the aim of establishing the impact of participants’ SO ambivalence on their ability to detect the SO of targets in addition to how torn targets felt towards their SO.

Overall, participants with high amounts of SO ambivalence had an enhanced ability to detect targets’ SO, but *only* via targets’ responses on the implicit measure of SO. In addition, participants with higher amounts of SO ambivalence perceived targets as feeling more torn towards their sexuality when the target expressed higher levels of same-sex attraction.

In line with hypothesis 6.2, individuals with high amounts of SO ambivalence had unique insights into targets’ SO ambivalence. First of all, targets were more likely perceived as torn when the target had high amounts of ambivalence; however, this effect was marginal. Second, perceptions of targets’ SO appeared to be guided by targets’ direction of SO ambivalence. In particular, targets were perceived as more gay when the target expressed being *more straight* on the explicit measure of SO relative to their score on the implicit measure. Additionally, targets were perceived as more straight when the target expressed being *less straight* on the explicit measure of SO relative to their score on the implicit measure.

Interestingly, an interaction between participants’ amount and direction of SO ambivalence impacted the association between judgements of SO and the direction of targets’ SO ambivalence. That said, the pattern of findings were not consistent with hypothesis 6.3. When participants reported being more straight on the explicit measure of SO relative to their score on the implicit measure, those

with low ambivalence perceived targets as straight when the target had the same direction of ambivalence. The same effect showed that, when participants reported being more straight on the explicit measure of SO relative to their score on the implicit measure, those with high ambivalence perceived targets as straight when the target expressed being less straight on the explicit measure relative to their score on the implicit measure.

Discussion

The final empirical chapter in this thesis describes initial research detailing potential wider influences of explicit-implicit SO ambivalence. As a starting point, the research investigated whether participants could perceive individual differences in straight-identified targets' explicitly and implicitly measured SO, in addition to perceptions of how torn targets felt towards their SO. The research then considered the moderating influence of perceivers' own SO ambivalence on social perception judgements.

General perceptibility of targets' SO ambivalence

Overall, when straight-identified targets reported same-sex attraction and interest, they were more likely to be perceived as gay and torn. This finding corroborates past work demonstrating that SO is communicated via non-verbal markers of SO (Rule, 2015; Rule et al., 2008; 2009). The findings, however, extend past work by showing that *individual differences* in SO can be communicated via such non-verbal markers. In the present research, *all* targets self-identified as straight, and it appears that those with same-sex attraction and interest could have this detected via their handwriting. In addition, while participants overall were unable to detect targets' explicit-implicit SO ambivalence, it appears that

participants were able to detect the discrepancy between targets' self-reported opposite- and same-sex attraction. When such a discrepancy occurred, targets were perceived as more gay and more torn about their sexuality. This finding adds to the few pre-existing research examples highlighting the perceptibility of others' ambivalence (Griffin & Sayette, 2008; Heisel & Mongrain, 2004). Taken together, the findings suggest that the ambivalence people feel towards their sexual orientation can be communicated via perceivable non-verbal markers.

Feeling torn and seeing torn: The moderating influence of SO ambivalence on the perception of non-verbal information

The research described in this chapter provides preliminary evidence documenting that explicit-implicit SO ambivalence is associated with the processing of *non-verbal* information. In particular, participants with high amounts of explicit-implicit SO ambivalence appeared to be more sensitive to targets' SO; something that was revealed by the congruency between participants' SO judgements and targets' implicitly measured SO. Furthermore, participants with high amounts of SO ambivalence perceived targets as feeling more torn towards their SO when the target expressed same-sex attraction and interest.

Participants with high amounts of SO ambivalence also formed judgements of SO on the basis of targets' direction of SO ambivalence. This provides further support for the stipulation that explicit-implicit SO ambivalence is associated with the processing of relevant *non-verbal* information. In particular among participants with high amounts of SO ambivalence, targets were perceived as more gay when the target expressed being *more straight* on the explicit measure of SO relative to their score on the implicit measure. Additionally, targets were perceived as more

straight when the target expressed being *less straight* on the explicit measure of SO relative to their score on the implicit measure.

As an aside, these findings could demonstrate for the first time that ambivalence *generally* could be associated with the processing of relevant non-verbal information. This would have an important impact on attitude and ambivalence research – perhaps the information processing consequences associated with ambivalence go deeper than that previously conceived. In other words, it could be the case that individuals with explicit-implicit ambivalence also process relevant non-verbal information in an attempt to resolve their ambivalence. Other work has demonstrated that a vast range of thoughts, traits and behaviours are communicated non-verbally. For instance, people are accurately able to detect from facial features outcomes such as suicidality, extraversion, and preference for receptive versus insertive intercourse in gay men (Kleiman & Rule, 2013; Rule, Krendl, Ivcevic, & Ambady, 2013; Tskhay, Re, & Rule, 2014). As such, future research should investigate whether explicit-implicit ambivalence moderates the perception of other kinds of thoughts, traits, and behaviours.

Interestingly, an interaction between participants' amount and direction of SO ambivalence impacted the association between social perception judgements and the direction of targets' SO ambivalence. In Studies 1 through 3, one group of individuals were consistently found to process SO-relevant information in a way that would only be expected among those with high amounts of SO ambivalence – particularly when straight-identified participants reported being *more straight* on the explicit measure of SO relative to their score on the implicit measure *and* the amount of ambivalence was low. This finding was explained to be a consequence of

such individuals perhaps concealing elements of same-sex attraction. In the current study, these individuals perceived targets with the same direction of SO ambivalence as more straight and more torn. These findings provide further evidence that this specific profile of SO ambivalence represents something of great empirical interest, perhaps showing that this group of individuals are able to identify similar others. Above all, the findings suggest that this specific profile of SO ambivalence could be communicated via non-verbal markers, and those who experience the ambivalence have an enhanced ability to detect it. This is supported by past work demonstrating that self-relevant evaluations produce an advantage when it comes to perceiving similar others (Wilson & Rule, 2014).

Limitations and concluding remarks

The work described in this chapter has produced some fascinating initial insights into the potential wider effects of SO ambivalence. However, there are a few limitations. In particular, the magnitudes of the correlations described in this research tend to be small, demonstrating that the described effects are particularly subtle. That said, consistent with the effects described in this chapter, unpublished raw data of Nicholas Rule (2015) has shown that peoples' ability to detect targets' SO from samples of handwriting is nuanced relative to detecting SO from images of targets' faces (e.g., Rule et al., 2009). As such, the subtle effects demonstrated in this study would be expected to be greater in future work seeking to replicate this study using images of faces as opposed to samples of handwriting.

In addition, further and more expansive replications of this work will be necessary in order to better understand the results – for example, what is it about handwriting samples that make particular individual differences more perceptible than others? One possibility is that certain stylistic qualities impact perceptual

judgements. For example, Tett and Palmer (1997) asked participants to write out a sentence and to complete a personality inventory. The sentences of each participant were then coded according to a number of “handwriting elements” (e.g., t-crossings, heavy versus light pressure, pointedness). The study found positive associations between social confidence and the angularity of the letters “m” and “n,” empathy and left slant and writing pressure, responsibility and the length of t-cross. Another possibility is the relative femininity or masculinity of the handwriting samples impacting perceptual judgements. For example, Tskhay and Rule (2013) presented participants with faces of gay men who preferred either receptive or insertive intercourse. The faces of gay men who preferred insertive intercourse were perceived as more masculine than those who preferred receptive intercourse. Furthermore, subsequent analyses indicated that participants relied on facial masculinity to interpret men’s sex roles.

Despite these concerns, the work in this chapter documents the potential importance and widespread influences of explicit-implicit SO ambivalence, providing great scope for future work on this topic. Future work should seek to address whether the effects described in this work are of greater magnitude when studying faces. Further, future work should also investigate possible cues that participants base their social judgements on.

CHAPTER SEVEN:
GENERAL DISCUSSION

Overview of Chapter

The work described in this thesis aimed to investigate implications of explicit-implicit SO ambivalence for psychological well-being *and* information processing in samples of straight- and gay-identified individuals. Studies 1 through 3 described research specific to the experience of three independent samples of straight-identified individuals. Studies 4 and 5 described research specific to the experience of two independent samples of gay-identified individuals. The research on gay-identified individuals also examined implications associated with discrepant explicitly and implicitly measured (positive/negative) evaluations towards one's SO. The final empirical study (Study 6) examined the wider implications of SO ambivalence on the processing of relevant non-verbal information in a further sample of straight-identified individuals. This chapter discusses the respective findings and situates them in the context of previous research. The chapter also considers limitations in addition to future directions and the wider implications of the research.

**Implications of Explicit-Implicit SO Ambivalence in Samples of Straight-
Identified Individuals**

Well-being and self-identity

The work described in Chapter Two made the case for the hypothesised agony of explicit-implicit SO ambivalence among straight-identified individuals. This stemmed from research showing reduced psychological health among straight-identified males and females when they reported discrepant same-sex behaviour (see e.g., Gattis et al., 2012). One possible explanation for these findings

could be the experience of explicit-implicit SO ambivalence. Why would straight-identified individuals with same-sex attraction and interest experience explicit-implicit SO ambivalence? Within society exists widespread anti-gay attitudes (Herek & McLemore, 2013) that implicate *normalised* and traditional labels of SO such as “straight” (see Vrangalova & Savin-Williams, 2012). As such, when straight-identified individuals experience a degree of same-sex attraction and interest, they may be motivated to maintain traditional labels of SO to rebuff negative societal perceptions. By affirming socially desirable labels of SO despite same-sex interest, this could attenuate the association between explicit and implicit measures of SO, resulting in explicit-implicit ambivalence. Explicit-implicit ambivalence has well documented negative psychological effects (Creemers et al., 2012; Rydell et al., 2008; Rydell & Durso, 2012; Schröder-Abé et al., 2007). In addition, when individuals are motivated to conceal their SO (something that would imply discrepant explicit and implicit evaluations of SO), this has also been shown to have negative effects for both psychological and physical health (e.g., depression and faster progression of HIV infection; Frost et al., 2007; Ullrich et al., 2003). In conjunction, this research makes it plausible that the effects uncovered by past research (i.e., Gattis et al., 2012), could be a consequence of straight-identified individuals experiencing explicit-implicit SO ambivalence.

In line with the hypothesis that the experience of explicit-implicit SO ambivalence would implicate negative outcomes for psychological health among straight-identified individuals, Study 1 found that high amounts of SO ambivalence resulted in (marginally) poorer psychological well-being on an index of self-esteem, life-satisfaction, and happiness. In addition, high amounts of SO ambivalence was linked with reduced cognitive reappraisal. This latter finding

suggested that high amounts of SO ambivalence could be associated with other cognitive processes. Specifically, it appeared that explicit-implicit SO ambivalence is associated with a reduced capacity to reinterpret the meaning of stressful life events as to reduce their emotional impact (Mauss et al., 2007; Ray et al., 2005).

Given that explicit-implicit SO ambivalence could, theoretically, be a consequence of straight-identified individuals being motivated to self-report their SO in ways that are socially desirable, it was also proposed that SO ambivalence implicates negative perceptions towards one's SO identity. This reasoning was supported by past work that has shown, in samples of gay and bisexual men, the concealment of one's SO (for reasons of social desirability) to result in relative difficulty to form positive feelings towards that identity (Frale et al., 1997).

In line with this hypothesis, Study 1 showed that high amounts of explicit-implicit SO ambivalence resulted in negative perceptions of sexual identity on an index that comprised centrality (the extent to which SO is seen as part of the self), affect (positive/negative feelings felt towards SO), and ties (social connectedness and commonalities with other straight-identified individuals). Specifically, individuals with high amounts of SO ambivalence felt more detached from their SO, felt more negative towards their SO, and reported fewer social connections and commonalities with other straight-identified individuals. Unexpectedly, the direction of SO ambivalence also impacted sexual identity, with the same negative outcomes among those who reported being *more straight* on the explicit measure of SO relative to their score on the implicit measure of SO.

Interestingly, these main effects were qualified by a marginal interaction between the amount and the direction of SO ambivalence. In particular, among those who reported being *less straight* on the explicit measure of SO relative to

their score on the implicit measure, those with high amounts of SO ambivalence felt more detached from, and more negative towards, their SO in addition to reporting fewer social connections and commonalities with other straight-identified individuals. This finding was explained to be a consequence of the magnitude of the explicit-implicit discrepancy producing negative effects, something that is in line with past research (e.g., Rydell et al., 2008; Rydell & Durso, 2012).

In addition, the interaction revealed that among those who reported being *more straight* on the explicit measure of SO relative to their score on the implicit measure, those with high and low amounts of SO ambivalence felt more detached from, and more negative towards their SO, in addition to reporting fewer social connections and commonalities with other straight-identified individuals. As such, for this particular direction of SO ambivalence, negative self-identity was not a consequence of the magnitude of the explicit-implicit discrepancy. Instead, it appeared that the precise implication of this direction of SO ambivalence elicited the observed effects. These individuals self-identify as straight, and in line with this identity they predominately reported opposite-sex attraction and interest. At the same time, responses on the implicit measure of SO revealed a relatively weaker identity with being straight. On this basis it was suggested that this direction of SO ambivalence could reflect a group of individuals who conceal aspects of same-sex attraction and interest, resulting in negative self-identity, a finding that is supported by past research (e.g., Frable et al., 1997).

Information processing

Given the negative psychological effects of explicit-implicit SO ambivalence among straight-identified individuals, a subsequent aim was to investigate *how*

individuals attempt to resolve their SO ambivalence. In particular, the research investigated the impact of individual differences in explicit-implicit SO ambivalence on the processing of SO-relevant information. The rationale for this stems from research linking the experience of explicit-implicit attitudinal ambivalence with deeper processing of information that is relevant to the domain of the ambivalence being experienced (see e.g., Briñol et al., 2006).

Consistent with these effects, Study 1 hypothesised that those with high amounts of ambivalence would be motivated to reduce their ambivalence by systematically processing information relevant to sexuality. Based on the amount *and* the direction of SO ambivalence contributing to negative perceptions of sexual identity, Study 1 further hypothesised that the amount and the direction of SO ambivalence would impact the processing of information relevant to sexuality. In particular, it was predicted that those with high (but not low) amounts of SO ambivalence would process more deeply but only when they reported being *less straight* on the explicit measure of SO relative to their score on the implicit measure. Additionally, comparable high processing was expected among those with high or low SO ambivalence when such individuals reported being *more straight* on the explicit measure of SO relative to their score on the implicit measure.

In Studies 1 and 2, the results supported these hypotheses, demonstrating for the first time that *both* the amount and the direction of ambivalence impact the processing of relevant information. This was the case when the dependent variable was the amount of time it took participants to read and respond to direct questions on sexuality. While past research has often utilised reading time of relevant information to indicate the amount of systematic processing (e.g., Chaiken, 1980;

Edwards & Smith, 1996; Pratkanis & Greenwald. 1993), longer response times could indicate *response competition* (e.g., Fazio, 2001). In other words, when individuals were presented with the direct questions on sexuality, these could have acted as prime that subsequently promoted a particular response. In the context of ambivalence, competition occurs between conflicting evaluations, resulting in slower response times as a result of needing to allocate greater cognitive resources to suppress conflicting responses (Bargh et al., 1992). As such, as opposed to showing systematic processing, response time could simply reflect the amount of conflict between different and competing aspects of SO (see van Harreveld et al., 2004 for a similar conclusion).

To account for this possibility, Study 3 used a well-established paradigm to measure systematic information processing, namely, the *thought listing technique*. This paradigm provided a measure of *elaboration* (e.g., Edwards & Smith, 1996; Petty & Cacioppo, 1979; see Petty, Haugtvedt, & Smith, 1995 for an overview on elaborative processing). In the study, straight-identified participants read information that was either SO-relevant or non-SO-relevant. Subsequently, they were invited to report their thoughts. Overall, the amount of elaboration elicited a pattern of findings consistent with the response time measure. As such, Study 3 provided direct and convergent evidence that the response time findings in Studies 1 and 2 reflected differences in the deliberation of information relevant to sexuality, confirming the robustness of these effects.

Theoretical explanation

Given the robust and convergent findings, the thesis detailed a theoretical explanation of the effects among straight-identified individuals. First, among those who report being *less straight* on the explicit measure of SO relative to their score

on the implicit measure, those with high (but not low) amounts of SO ambivalence deeply processed information that is relevant to SO. Concurrent with research finding explicit-implicit ambivalence to result with negative psychological consequences (Creemers et al., 2012; Rydell et al., 2008; Rydell & Durso, 2012; Schröder-Abé et al., 2007), it is likely that individuals with high amounts of SO ambivalence in this directional context experience negative psychological effects (e.g., negative perceptions of self-identity; Study 1). It appears that these individuals then seek to reduce these effects by processing relevant information in more detail.

Second, among those who reported being *more straight* on the explicit measure of SO relative to their score on the implicit measure, those with high and low amounts of SO ambivalence engaged in systematic processing. This finding is novel relative to that described in past research (i.e., Briñol et al., 2006), and demonstrates that the effect is a consequence of the precise implication imposed by this direction of SO ambivalence. Specifically, these individuals self-identify as straight, and in line with this identity they predominately reported opposite-sex attraction and interest. At the same time, responses on the implicit measure of SO revealed a relatively weaker identity with being straight. As such, it is plausible that this group of individuals may be concealing some elements of same-sex attraction and interest, resulting with implicit associations of SO that conflict with self-identified SO. In other words, it appears that this group of straight-identified individuals affirm the traditional label of SO, perhaps to avoid the societal stigma associated with same-sex attraction and interest (e.g., Herek & McLemore, 2013). This specific set of circumstances may be sufficient to elicit the effects associated

with the experience of ambivalence, and hence the motivation to reduce these effects.

Limitations. This part of the thesis revealed some highly robust and convergent findings. The theoretical explanation of the findings, however, includes assumptions that need further testing in future research. For instance, the research did not include outcomes designed to directly assess the negative feelings of ambivalence. To deal with this concern, a future study could use the procedure of Study 3, but include a measure of *physiological arousal*. Past research has included such a measure to provide a means to establish the aversive nature of ambivalence, with greater physiological arousal showing negative feelings (van Harreveld et al., 2009). Additionally, a future study could also measure the amount of *dissonance* experienced by participants during the procedure – again this has been used by past research to ascertain the discomfort of ambivalence (Rydell et al., 2008).

In a similar vein, the present research did not assess whether SO-relevant elaborative thought was successful in reducing the associated ambivalence. Past research has demonstrated correspondence between the amount of elaboration and a reduction in ambivalence (Nordgren et al., 2006). As such, any future study could address the impact of SO-relevant elaboration on the ambivalence that is experienced.

The role of anti-gay attitudes

A novel component to Study 3 was the decision to include a self-report measure of anti-gay attitudes. The rationale for this stemmed from the work of Weinstein et al. (2012) who found that when participants reported being straight on an explicit measure of SO, anti-gay attitudes were found when individuals were relatively more gay on an implicit measure of SO. Weinstein and colleagues

interpreted this finding to be a product of reaction formation. Namely, self-identified straight individuals were anti-gay when implicit evaluations of SO ("I am gay") threatened self-identified SO ("I am straight"). In other words, self-reported anti-gay attitudes served to rebuff negative self-perceptions, reducing the likelihood of self-invalidation.

In the context of the present research, the interaction between the amount and the direction of SO ambivalence on information processing revealed no difference in processing between those with high and low amounts of ambivalence when such individuals reported being *more straight* on the explicit measure of SO relative to their score on the implicit measure. It could be said that that responses on the implicit measure of SO among these individuals are *relatively gay* when compared to their explicit responses of SO. As such, a parallel can be drawn between this result and the findings of Weinstein et al. (2012). Specifically, it was reasoned that the null difference between those with high and low amounts of ambivalence, in this directional context, could be explained by a defensive process. In other words, anti-gay attitudes were hypothesised among those who reported being *more straight* on the explicit measure of SO relative to their response on the implicit measure because responses on the implicit measure of SO ("I have some identification with being gay") threaten explicit evaluations of SO ("I am straight").

While a direct link between SO ambivalence and anti-gay attitudes was not found, for those who reported being more straight on the explicit measure of SO relative to the implicit measure, anti-gay attitudes influenced response times to questions on sexuality. In particular, among those with low ambivalence (in this directional context), those with anti-gay attitudes took longer to complete the explicit questions on sexuality, implying deeper processing. This finding suggested

that defensiveness (i.e., anti-gay attitudes) could be a key a key motivator of systematic processing for some people who experience SO ambivalence.

Limitations. The research described here implies that anti-gay attitudes have the potential to moderate the processing of information that is relevant to sexual orientation. This finding is of great empirical interest, however, in order for the conclusions to be accepted without doubt, future research needs to replicate the effects with the elaboration measure of processing. This was not done in the Study 3 owing there not being enough cases to conduct the respective analysis. Furthermore, the effect described here could be a consequence of the measure of anti-gay attitudes being completed last. For example, the reading of a commentary on the introduction of gay marriage could have impacted anti-gay attitudes.

Findings Specific to Gay-identified Individuals

The discussion now turns to describing findings specific to gay-identified individuals (Studies 4 and 5). To begin, I describe the rationale for addressing an additional kind of ambivalence in this part of thesis, namely, the discrepancy which occurs between explicitly and implicitly (positive/negative) measured evaluations of one's SO.²⁵ The effect of this discrepancy is then considered. Subsequently, implications of SO ambivalence for information processing and psychological well-being are discussed.

I like it and I don't like it – the effect of discrepant explicitly and implicitly measured evaluations of one's SO

A novel component to this part of the thesis was the inclusion of explicit and implicit measures of (positive/negative) evaluations felt towards one's SO. These

²⁵ The results are discussed in this order because these additional measures are relevant to the discussion on the effects of explicit-implicit SO ambivalence in gay-identified individuals.

measures were included on the basis of a large body of evidence showing that gay-identified individuals are more likely to experience mental health problems (e.g., Chakraborty et al., 2011; Haas et al., 2011; King et al., 2003, 2008). One explanation for the higher prevalence of mental health problems is the experience of *minority stress*, stress that is experienced on account of minority group status (e.g., the negative effects of concealing SO; Critcher & Fergusson, 2014; Hatzenbuehler et al., 2009, 2011; Meyer, 2003). Minority stress among gay-identified individuals can result in negative implicitly measured evaluations of SO, something that also has negative consequences for psychological health (Hatzenbuehler et al., 2009). On this basis it was deemed imperative to measure gay-identified individuals' evaluations towards their SO.

In Study 4, as with explicit-implicit SO ambivalence, the research investigated the impact of discrepant explicit and implicit evaluations of SO by calculating the amount and the direction of explicit-implicit ambivalence. Interestingly, Study 4 found a main effect of the amount of ambivalence on an index of discrepant (explicit-implicit) self-esteem. In other words, gay-identified individuals with discrepant explicitly and implicitly measured evaluations towards their SO were more likely to experience discrepant self-esteem.

To expand on this, Study 5 hypothesised that discrepant explicitly and implicitly measured evaluations towards one's SO would impact associates of discrepant self-esteem, including perfectionism (Ziegler-Hill & Terry, 2007), smaller actual-ideal discrepancy (Bosson et al., 2003), and out-group discrimination (Jordan et al., 2003). In support of this hypothesis, a (marginal) main effect of the amount of ambivalence on actual-ideal discrepancy was found. Specifically, gay-identified individuals with discrepant explicitly and implicitly

measured evaluations towards their SO were more likely to report smaller actual-ideal discrepancies, consistent with the idea that that this kind of ambivalence could be associated with a defensive process (Bosson et al., 2003; Haddock & Gebauer, 2011).

Clear-cut support linking the amount of ambivalence with perfectionism and out-group discrimination was not found. However, the research did uncover a series of unexpected and highly convergent findings on the effect of explicit-implicit evaluations towards one's SO.

Negative outcomes for psychological well-being and functioning were consistently found amongst those who positively evaluated their SO on the explicit measure whilst being *somewhat* (i.e., a low amount of ambivalence) more negative towards it on the implicit measure. These negative outcomes included lower self-esteem, higher levels of negative affect, low mindfulness, and low emotional stability. The same individuals also reported higher perfectionist tendencies and higher incidence of discrimination on the basis of SO (that which occurred more than 12-months ago).

Theoretical explanation

The thesis stated three positions supporting the argument that this profile of ambivalence - those who positively evaluated their SO on the explicit measure of SO whilst being *somewhat* (i.e., low amounts of ambivalence) more negative towards it on the implicit measure – represents a group of individuals who may experience *stigma* of being gay.

First, it is likely that this profile of ambivalence is associated with *coping strategies* designed to dispel stigma-related stress. In order to defend against internalised negative feelings (i.e., feelings of shame that are detected by the

implicit measure), positive self-reported evaluations towards one's SO are reported. This finding concurs with that observed in the self-esteem literature, where individuals defend the self against negative implicitly measured self-perceptions by adopting *positive* explicitly measured evaluations of self-worth (e.g., Jordan et al., 2003, 2005). Second, this particular profile of ambivalence was associated with higher perfectionist tendencies, something that reflects a *problem-focused* method of coping (e.g., Folkman, Lazarus, Gruen, & DeLongis, 1986; Luce et al., 1997). Taken together, these findings suggest that this profile of ambivalence - those who positively evaluated their SO on the explicit measure of SO whilst being *somewhat* (i.e., low amounts of ambivalence) more negative towards it on the implicit measure - is associated with strategies designed to inflate aspects of the self in a favourable way. This may provide such individuals resiliency to stigma and its effects (e.g., Miller et al., 1995; Pinel, 1999).

Second, this profile of ambivalence was found to be associated with higher perceptions of discrimination on the basis of SO (that which occurred more than 12-months ago). This finding could suggest that this profile of ambivalence is an *antecedent of stigma-related stress*. For example, discrimination on the basis of SO is a factor known to result in minority stress, something that has severely negative effects for psychological well-being (Frisell et al., 2010; Wamala et al., 2007). On account of its negative psychological effects, it is understandable that the experience of discrimination could result in an *internalised* dislike of sexual orientation (i.e., discrimination on the basis of my SO makes me feel bad, therefore I dislike my SO). Alternatively, the finding could demonstrate that this profile of ambivalence is a *consequence of stigma-related stress*. Of relevance, the same effect was not found for recent reports of discrimination in addition to discrimination

directed towards gay individuals more generally (i.e., group-level discrimination). Other research demonstrates that stigmatised individuals are likely to deny or minimise reports of discrimination in order to minimise its psychological effects (for an overview see Heatherton et al., 2000). In other words, reports of discrimination, or lack thereof, could be a consequence of stigma.

Finally, the finding that this profile of ambivalence is associated with an array of negative psychological outcomes is convergent with literature showing the negative effects of internalised anti-gay stigma (Hatzenbuehler et al., 2009; Newcomb & Mustanski, 2010). This associative link could also imply *acceptance* of negative societal anti-gay attitudes (Chassin & Stager, 1984).

Summary

To ascertain how gay-identified individuals felt towards their SO, the research described in Studies 4 and 5 included explicit and implicit measures of (positive/negative) evaluations towards one's SO. In Study 4, gay-identified individuals with discrepant explicitly and implicitly measured evaluations towards their SO were more likely to experience discrepant self-esteem. As such, Study 5 investigated the impact this kind of ambivalence had on outcomes of discrepant self-esteem. Individuals with discrepant explicitly and implicitly measured evaluations towards their SO were more likely to report smaller actual-ideal discrepancies. Interestingly, negative outcomes for psychological well-being and functioning were consistently found amongst one group of individuals, specifically, those who positively evaluated their SO on the explicit measure whilst being *somewhat* (i.e., low amounts of ambivalence) more negative towards it on the implicit measure.

Implications of explicit-implicit SO ambivalence

Information processing

The effect of individual differences in explicit-implicit SO ambivalence on information processing was examined in gay-identified individuals using the response time measure of processing. In Study 4, the results revealed that the amount and the direction of SO ambivalence impacted the processing of SO-relevant information, but in ways different to those observed in straight-identified individuals. Among gay-identified individuals this interaction revealed a difference in systematic processing among those with high amounts of SO ambivalence as a function of the direction of SO ambivalence. Specifically, among gay-identified individuals with low amounts of SO ambivalence, processing did not differ as a function of the direction of SO ambivalence. Instead, individuals with high amounts of SO ambivalence spent longer completing direct questions on sexuality when they reported being *more gay* on the explicit measure of SO relative to their score on the implicit measure. This implied that such individuals engaged in systematic processing.

Theoretical explanation. In Study 4 it was implied that this could reflect an identity conflict. Namely, the individuals who engaged in deeper processing identified as gay, yet responses on the implicit measure of SO were *less* congruent with this perception. As such, this could represent a group of individuals who have “come out” while maintaining a degree of opposite-sex attraction and interest – something that prompts the processing of SO-relevant information. Such an explanation is consistent with research showing that the categorical labels traditionally used to describe SO (e.g., straight, gay) *do not* capture the complexity that is sexual orientation (Diamond, 2003; Vrangalova & Savin-Williams, 2012).

Hence, the finding could represent a lack of consensus that has sometimes been reported between differing components of SO (e.g., Gattis et al., 2012; Vrangalova & Savin-Williams, 2012). As such, it is understandable that the finding – deeper processing of SO-relevant information among those who reported being more gay on the explicit measure of SO relative to the implicit measure (in the context of high ambivalence) – reflects the complex phenomenon of sexual orientation: people feel compelled to report being gay because this is a label of SO that they have accepted, and it is one that is socially entrenched. However, such a label might not truly reflect underlying sexual attractions and behaviours, resulting in deep and systematic processing of relevant information when such a discrepancy occurs.

Limitations. The interpretation outlined above needs to be treated with some caution. A proximal aim of Study 5 was to replicate these effects in a different sample of gay-identified individuals. Overall, the interactive pattern of findings was not replicated. Instead, Study 5 revealed a main effect of the amount of explicit-implicit ambivalence on the time it took to complete direct questions on sexuality. The reason for the discrepant findings is difficult explain without conducting a further and more expansive replication in another sample of gay-identified individuals. For instance, in order to be sure that the patterns of findings described here represent processing, it would also be important to replicate this research using an elaboration measure of processing. That said, the results from Studies 4 and 5 in conjunction present clear evidence that the experience of SO ambivalence in gay-identified individuals *is* associated with the processing of direct questions on sexuality, however, the precise nature of the association, and

the extent to which this represents information processing, are still yet to be confirmed.

Well-being

Study 4 also investigated the effect of explicit-implicit SO ambivalence on outcomes of well-being in gay-identified individuals. As a starting point, an interaction between the amount and the direction of SO ambivalence impacted (explicitly measured) self-esteem. This interaction revealed one group of individuals to have significantly higher self-esteem, specifically, when individuals reported being *less gay* on the explicit measure of SO relative to the implicit measure *when* the amount of SO ambivalence was low. Chapter Four presented two arguments that explained why such individuals reported higher self-esteem. First, it could be that this group of individuals *minimise* the extent to which they report same-sex attraction and interest, something that could be adaptive in light of societal anti-gay prejudice. Second, a high amount of ambivalence typically corresponds with worse psychological outcomes (e.g., self-doubt and discrepant self-esteem; Briñol et al., 2006; Creemers et al., 2012; Schröder-Abé et al., 2007). As such, low amounts of ambivalence typically result with better psychological outcomes. It is plausible that the combination of these factors could contribute to reports of higher self-esteem.

Interestingly, Study 4 also found an association between greater amounts of SO ambivalence and negative implicitly measured evaluations of one's SO. This finding suggested that SO ambivalence is associated with an experience of minority stress (Hatzenbuehler et al., 2009; Meyer, 1995; 2003). To the extent that SO ambivalence *is* associated with the experience of minority stress in gay-identified individuals, Study 5 hypothesised that greater amounts of SO ambivalence would

be associated with another outcome of minority stress, namely, discrimination on the basis of SO (Balsam et al., 2005; Frisell et al., 2010; Meyer, 1995; 2003; Wamala et al., 2007).

Specific individual differences in SO ambivalence were associated with discrimination on the basis of SO. High levels of discrimination were reported among individuals who reported being *less gay* on the explicit measure of SO relative to their responses on the implicit measure *when* the amount of ambivalence was low. This was the case for reports of discrimination directed towards gay-identified individuals within society, in addition to recent personal experiences of discrimination (within the past 12-months). Interestingly, the same individuals did not experience negative psychological outcomes, something that is at odds with the experience of minority stress (e.g., Hatzenbuehler et al., 2009; 2011; Meyer, 2003). However, the same individuals were also found to have higher levels of extraversion and agreeableness. As such, it could be the case that this specific kind of SO ambivalence *is* associated with minority stress, however, a degree of psychological resiliency (as a result of extraversion and agreeableness) mitigates any resulting detriment. This argument is supported by research showing that stigma relates to psychological health *only* when an individual lacks the resources to cope (for an overview see Heatherton et al., 2000).

Outgroup discrimination

As described above, Study 5 included a number of measures that are known associates of discrepant self-esteem. The experience of explicit-implicit SO ambivalence was found to be associated with one of these, outgroup discrimination. Specifically, higher levels of were observed among those who reported being *more gay* on the explicit measure of SO relative to their response on

the implicit measure. This finding converges with past research on self-esteem, which has found the same direction of explicit-implicit ambivalence (i.e., $E > I$) to result in out-group discrimination (Jordan et al., 2003; 2005). As with this research, this finding perhaps can be explained by the *defensive* nature of this direction of SO ambivalence, and the self-enhancement strategies that this consequentially entails.

Additional limitations

The findings described in Studies 4 and 5 could be impacted by both Type I and Type II error. In both studies the number of analyses were a large, making a false positive more likely. However, in these latter studies there was considerable coherence among the significant effects. Further, in Studies 4 and 5, the power of the statistical analyses was impacted by low samples sizes due to the difficulty with recruiting gay-identified participants. This scenario decreases the likelihood of detecting significant effects (i.e., Type II error). However, in response to the latter, the sample sizes in both studies are comparable to other *experimental research* that has studied sexual minorities (e.g., Hatzenbuehler et al., 2009; Snowden et al., 2008).

On the Wider Effects of Explicit-Implicit SO Ambivalence: Feeling Torn and Seeing Torn

This thesis has paid considerable attention to the information processing consequences of explicit-implicit SO ambivalence. Taken together, across the independent samples of straight- and gay-identified participants, the results demonstrate the influence of SO ambivalence on the processing of information that is relevant sexuality. To take this further, in an additional sample of straight-

identified participants, Study 6 investigated whether SO ambivalence impacted the processing of *non-verbal* information.

Past research has shown that ambivalence impacts non-verbal communication via the face. In one example, when people were ambivalent towards smoking, this was likely to result in simultaneous activation of positive and negative facial expressions (Griffin & Sayette, 2008). Another study showed that the simultaneous experience of positive and negative emotions also impacted facial expressions (Heisel & Mongrain, 2004). On the basis of this evidence it was hypothesised that explicit-implicit SO ambivalence could be communicated non-verbally. Based on past research finding that people are able to detect the SO of others via their handwriting (Rule, 2015), participants made a series of judgements on the SO ambivalence of others via small samples of handwriting (referred to as *targets*), *all* written by straight-identified individuals in a previous study. Overall, when straight-identified targets reported same-sex attraction and interest, they were more likely to be perceived as gay and feeling torn towards their sexuality. In addition, participants were sensitive to the discrepancy between targets' self-reported opposite- and same-sex attraction. When such a discrepancy occurred, targets were perceived as gay and torn. These findings showed that while explicit-implicit ambivalence cannot be perceived overall, other kinds of ambivalence towards one's SO, namely explicit ambivalence, can be detected.

More recent evidence has demonstrated that peoples' sensitivity to non-verbal information (e.g., faces of those who express conservative values) is enhanced by relevant self-evaluations (e.g., being a conservative; Wilson & Rule, 2014). On this basis it was hypothesised that individual differences in explicit-implicit SO ambivalence would moderate sensitivity to non-verbal SO relevant

information. In line with the research described in Studies 1 through 3 it was predicted that straight-identified participants with high amounts of SO ambivalence would have an enhanced ability to detect the SO ambivalence of targets.

Overall, some support for this hypothesis was found. For instance, when participants had high amounts of SO ambivalence, targets were perceived as torn when they had high amounts of ambivalence. Furthermore, participants with high amounts of SO ambivalence formed judgements of SO on the basis of targets' direction of SO ambivalence - targets were perceived as gay when the target expressed being *more straight* on the explicit measure of SO relative to their score on the implicit measure. Additionally, targets were perceived as straight when the target expressed being *less straight* on the explicit measure of SO relative to their score on the implicit measure.

In addition, participants' amount of SO ambivalence appeared to moderate their sensitivity to non-verbal SO-relevant information. For example, participants with high amounts of explicit-implicit SO ambivalence appeared to be more sensitive to targets' SO; something that was revealed by the congruency between participants' SO judgements and targets' implicitly measured SO. Moreover, participants with high SO ambivalence perceived targets as feeling more torn towards their SO when the target expressed same-sex attraction and interest. Together, this evidence provides support for the stipulation that explicit-implicit SO ambivalence results in an enhanced ability to detect the SO ambivalence of others. Furthermore, such individuals also appear to have an enhanced ability to detect non-verbal information that is relevant to SO.

In line with the research described in Studies 1 through 3, it was also predicted that an interaction between the amount and the direction of participants' SO ambivalence would impact sensitivity to targets' SO ambivalence. The findings revealed that an interaction between participants' amount and direction of SO ambivalence impacted perceptual judgements of targets' SO ambivalence. However, the precise pattern of this interaction did not support the hypothesis.

Limitations

Study 6 provided some fascinating initial insights into the potential wider effects of SO ambivalence on the processing of relevant non-verbal information. However, there are some limitations to this work. First of all, the magnitudes of the correlations described are small, demonstrating that the described effects are subtle. However, unpublished raw data of Nicholas Rule's (2015) has shown that people's ability to detect targets' SO from samples of handwriting is nuanced relative to detecting SO from images of targets' faces (e.g., Rule et al., 2009). As such, if future work was to replicate this study using images of faces as opposed to samples of handwriting, it is likely that the effects would be far greater.

As described in Chapter Six, further and more expansive replications of the work is necessary in order to fully understand the results – for instance, the study did not reveal which cues are being used to inform perceptual judgements. Future research should examine whether perceptual judgements are based on specific stylistic properties of handwriting in addition to how feminine/masculine handwriting is perceived to be (e.g., Tett & Palmer, 1997; Tskhay & Rule, 2013).

Despite the weaknesses, the work described here documents the potential importance and widespread influences of explicit-implicit SO ambivalence,

providing great scope for future work on this topic. (Future directions of this research are discussed under the next heading).

Wider Impacts of the Research

When low equals high: The importance of awareness and stigma

The research in this thesis is the first of its kind to show that individuals with low amounts of explicit-implicit ambivalence can experience the same *or* worse outcomes than those with high amounts of ambivalence. This was demonstrated in both straight- and gay-identified individuals, and with respect to different kinds of explicit-implicit discrepancy. Specifically, when straight-identified individuals reported being *more straight* on the explicit measure of SO relative to the implicit measure, those with high *and* low ambivalence engaged in systematic processing of SO-relevant information. In gay-identified individuals, when participants self-reported positive feelings towards their SO while being negative towards it on the implicit measure, those with *low ambivalence* experienced an array of negative outcomes.

What explains these findings? As a starting point, this could be a consequence of those with low ambivalence being more aware of their implicitly measured evaluations. While some researchers have argued that implicit measures assess non-conscious constructs, others have emphasised the contrary (see Gawronski et al., 2005 for an overview). Moreover, Study 5 demonstrated that there was greater correspondence between responses on the explicit and implicit measures of evaluation towards one's SO in the case of low ambivalence ($r = .64, p = .002$), but not in the case of high ambivalence ($r = -.42, p = .09$; see footnote 21). It is understandable that greater overlap in the context of low ambivalence could

demonstrate greater awareness of implicitly measured evaluations – evaluations which could permeate self-reports.

Why would this awareness even matter? For straight-identified individuals who report being *more straight* on the explicit measure relative to the implicit measure, their implicit evaluations are *stigmatised* on account of societal anti-gay attitudes. For gay-identified individuals who report positive feelings towards their SO whilst feeling negative towards it on the implicit measure, their implicit evaluations are a product of *internalised stigma* of being gay. As such, greater awareness of one's implicit evaluations in these scenarios could have made these individuals more aware of the associated stigma. Future research should address whether those with low ambivalence are more aware of their implicit evaluations in addition to the stigma associated with their implicit evaluations.

Ambivalence and the processing of relevant non-verbal information

The research described in Study 6 is the first to demonstrate that the experience of ambivalence could be associated with the processing of relevant non-verbal information. This could have important implications on the field of attitude and ambivalence research – perhaps the information processing consequences associated with ambivalence go far deeper than that previously conceived. For instance, in Briñol et al. (2006), individuals with discrepant explicit and implicit evaluations towards shyness deeply processed a shyness related persuasive message. Would the same individuals have enhanced sensitivity to detecting shyness from the face? Many studies have demonstrated the effects of discrepant self-esteem (e.g. Bosson et al., 2003; Creemers et al., 2012; Haddock & Gebauer et al., 2011). In line with research showing that self-evaluations enhance the ability to detect similar others (Wilson & Rule, 2014), would the same

individuals have enhanced sensitivity to detecting others with discrepant self-esteem? It could be the case that the processing of relevant non-verbal information in the context of ambivalence could also be an important mechanism used on the road to resolving the ambivalence. Other work has demonstrated that a vast range of thoughts, traits and behaviours are communicated via non-verbally. For instance, people are accurately able to detect from facial features suicidality, extraversion, and preference for receptive versus insertive intercourse in gay men (Kleiman & Rule, 2013; Rule, Krendl, Ivcevic, & Ambady, 2013; Tskhay, Re, & Rule, 2014). As such, future research should investigate whether explicit-implicit ambivalence moderates the perception of other kinds of thoughts, traits, and behaviours.

Conclusion

In all, this research has made a number of novel and important contributions in addition to providing interesting questions for future research. This thesis has shed light on the impact of explicit-implicit SO ambivalence on well-being and information processing in samples of both straight- and gay-identified individuals. For straight-identified individuals individual differences in the amount and the direction of SO ambivalence had clear implications for psychological well-being. Moreover, for straight-identified individuals, one point is abundantly clear: both the amount and the direction of explicit-implicit SO ambivalence are important when investigating how people process relevant information in an attempt to resolve their ambivalence. The robustness of the effects was confirmed by replicating the findings using different paradigms of information processing.

For gay-identified individuals individual differences in the amount and the direction of SO ambivalence also impacted the processing of SO-relevant

information, but in ways different to that observed in straight-identified individuals. Furthermore, individual differences in SO ambivalence were also associated with well-being, an outcome of stigma, in addition to out-group discrimination. Among gay-identified individuals, implications of discrepant explicitly and implicitly measured (positive/negative) evaluations towards one's SO were also measured. The results found that discrepant responses on these measures were associated with discrepant self-esteem and smaller actual-ideal discrepancies. In addition, when gay-identified individuals were positive towards their SO on the explicit measure whilst being somewhat negative towards it on the implicit measure, this scenario produced a wide-range of convergent negative outcomes.

The final part of the thesis examined wider implications of SO ambivalence in a further sample of straight-identified individuals. The findings showed that information relevant to SO ambivalence is communicated non-verbally, and that the experience of SO ambivalence moderates the ability to detect such information.

References

- Aidman, E. V., & Carroll, S. M. (2003). Implicit individual differences: Relationships between implicit self-esteem, gender identity, and gender attitudes. *European Journal of Personality, 17*, 19-37.
- Balsam, K. F., Rothblum, E. D., & Beauchaine, T. P. (2005). Victimization over the life span: A comparison of lesbian, gay, bisexual, and heterosexual siblings. *Journal of Consulting and Clinical Psychology, 73*, 477-487.
- Bargh, J. A., Chaiken, S., Govender, R., & Pratto, F. (1992). The generality of the automatic attitude activation effect. *Journal of Personality and Social Psychology, 62*, 893-912.
- Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007). The strength model of self-control. *Current Directions in Psychological Science, 16*, 351-355.
- Beals, K. P., Peplau, L. A., & Gable, S. L. (2009). Stigma management and well-being: The role of perceived social support, emotional processing, and suppression. *Personality and Social Psychology Bulletin, 35*, 867-879.
- Bosson, J. K., Brown, R. P., Ziegler-Hill, V., & Swann, W. B., Jr. (2003). Self-enhancement tendencies among people with high explicit self-esteem: The moderating role of implicit self-esteem. *Self and Identity, 2*, 169-187.
- Bradley, M. M., Miccoli, L., Escrig, M. A., & Lang, P. J. (2008). The pupil as a measure of emotional arousal and autonomic activation. *Psychophysiology, 45*, 602-607.

- Briñol, P., Petty, R. E., & Wheeler, S. C. (2006). Discrepancies between explicit and implicit self-concepts: Consequences for information processing. *Journal of Personality and Social Psychology*, 91, 154-170.
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84, 822-848.
- Burton, C. M., Marshal, M. P., Chisolm, D. J., Sucato, G. S., & Friedman, M. S. (2013). Sexual minority-related victimisation as a mediator of mental health disparities in sexual minority youth: A longitudinal analysis. *Journal of Youth Adolescence*, 42, 394-402.
- Bybee, J., Sullivan, E., Zielonka, E., & Moes, E. (2009). Are gay men in worse mental health than heterosexual men? The role of age, shame and guilt, and coming-out. *Journal of Adult Development*, 16, 144-154.
- Cacioppo, J. T., Glass, C. R., & Merluzzi, T. V. (1979). Self-statements and self-evaluations: A cognitive-response analysis of heterosocial anxiety. *Cognitive Therapy and Research*, 3, 249-262.
- Cacioppo, J. T., & Petty, R. E. (1981). Social psychological procedures for cognitive response assessment: The thought-listing technique. In X V. Merluzzi, C. R. Glass, & M. Genest (Eds.), *Cognitive assessment* (pp. 309-342). New York: Guilford Press.
- Cacioppo, J. T., & Petty, R. E. (1984). The elaboration likelihood model of persuasion. *Advances in Consumer Research*, 11, 673-675.

- Cacioppo, J. T., von Hippel, W., & Ernst, J. M. (1997). Mapping cognitive structures and processes through verbal content: The thought-listing technique. *Journal of Consulting and Clinical Psychology, 65*, 928-940.
- Cameron, J. E. (2004). A three-factor model of social identity. *Self and Identity, 3*, 239-262.
- Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology, 39*, 752-766.
- Chakraborty, A., McManus, S., Brugha, T. S., Bebbington, P., & King, M. (2011). Mental health of the non-heterosexual population of England. *The British Journal of Psychiatry, 198*, 143-148.
- Chassin, L., & Stager, S. F. (1984). Determinants of self-esteem among incarcerated delinquents. *Social Psychology Quarterly, 47*, 382-390.
- Chivers, M. L., Rieger, G., Latty, E., & Bailey, J. M. (2004). A sex difference in the specificity of sexual arousal. *Psychological Science, 15*, 736-744.
- Cochran, S. D., Sullivan, J. G., & Mays, V. M. (2003). Prevalence of mental disorders, psychological distress, and mental health services use among lesbian, gay, and bisexual adults in the United States. *Journal of Consulting and Clinical Psychology, 71*, 53-61.
- Clark, J. K., Wegener, D. T., & Fabrigar, L. R. (2008). Attitudinal ambivalence and message-based persuasion: Motivated processing of proattitudinal information and avoidance of counterattitudinal information. *Personality and Social Psychology Bulletin, 34*, 565-577.

- Creemers, D. H. M., Scholte, R. H. J., Engels, R. C. M. E., Prinstein, M. J., & Wiers, R. W. (2012). Implicit and explicit self-esteem as concurrent predictors of suicidal ideation, depressive symptoms, and loneliness. *Journal of Behavior Therapy and Experimental Psychiatry*, 43, 638-646.
- Critcher, C. R., & Ferguson, M. J. (2014). The cost of keeping it hidden: Decomposing concealment reveals what makes it depleting. *Journal of Experimental Social Psychology*, 143, 721-735.
- Crocker, J., & Major, B. (1989). Social stigma and self-esteem: The self-protective properties of stigma. *Psychological Review*, 96, 608-630.
- De Houwer, J., Custers, R. & De Clercq, A. (2006). Do smokers have a negative implicit attitude toward smoking? *Cognition and Emotion*, 20, 1274-1284.
- DeMarree, K. G., Wheeler, S. C., Brinol, P., & Petty, R. E. (2014). Wanting other attitudes: Actual-desired discrepancies predict feelings of ambivalence and ambivalence consequences. *Journal of Experimental Social Psychology*, 53, 5-18.
- Diamond, L. M. (1998). Development of sexual orientation among adolescent and young adult women. *Developmental Psychology*, 34, 1085-1095.
- Diamond, L. M. (2000). Sexual identity, attractions, and behaviour among young sexual minority women over a two-year period. *Developmental Psychology*, 36, 241-250.
- Diamond, L. M. (2003). What does sexual orientation orient? A biobehavioral model distinguishing romantic love and sexual desire. *Psychological Review*, 110, 173-192.

- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, 49, 71-75.
- Dovidio, J. F., Kawakami, K., & Gaertner, S. L. (2002). Implicit and explicit prejudice and interracial interaction. *Journal of Personality and Social Psychology*, 82, 62-68.
- Dovidio, J. F., Kawakami, K., Johnson, C., Johnson, B., & Howard, A. (1997). On the nature of prejudice: Automatic and controlled processes. *Journal of Experimental Social Psychology*, 33, 510-540.
- Edwards, K., & Smith, E. E. (1996). A disconfirmation bias in the evaluation of arguments. *Journal of Personality and Social Psychology*, 71, 5-24.
- European Union Agency for Fundamental Human Rights. (2013, May 1). Retrieved June 1, 2013, from <http://fra.europa.eu/en/publication/2013/eu-lgbt-survey-european-union-lesbian-gay-bisexual-and-transgender-survey-results>
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioural, and biomedical sciences. *Behavior Research Methods*, 39, 175-191.
- Fazio, R. H. (2001). On the automatic activation of associated evaluations: An overview. *Cognition and Emotion*, 15, 115-141.
- Fazio, R. H., Jackson, J. R., Dunton, B. C., & Williams, C. J. (1995). Variability in automatic activation as an unobtrusive measure of racial attitudes: A bona fide pipeline? *Journal of Personality and Social Psychology*, 69, 1013-1027.
- Fazio, R. H., & Olson, M. A. (2003). Implicit measures in social cognition research: Their meaning and use. *Annual Reviews of Psychology*, 54, 297-327.

- Fergusson, D. M., Horwood, L. J., Ridder, E. M., & Beautrais, A. L. (2005). Sexual orientation and mental health in a birth cohort of young adults. *Psychological Medicine, 35*, 971-981.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Palo Alto: Stanford University Press.
- Folkman, S., Lazarus, R. S., Gruen, R. J., & DeLongis, A. (1986). Appraisal, coping, health status, and psychological symptoms. *Journal of Personality and Social Psychology, 50*, 571-579.
- Frable, D. E. S., Wortman, C., & Joseph, J. (1997). Predicting self-esteem, well-being and distress in a cohort of gay men: The importance of cultural stigma, personal visibility, community networks, and positive identity. *Journal of Personality, 65*, 599-624.
- Frisell, T., Lichtenstein, P., Rahman, Q., & Långström, N. (2010). Psychiatric morbidity associated with same-sex behaviour: Influence of minority stress and familial factors. *Psychological Medicine, 40*, 315-324.
- Frost, D. M., Parsons, J. T., & Nanín, J. E. (2007). Stigma, concealment and symptoms of depression as explanations for sexually transmitted infections among gay men. *Journal of Health Psychology, 12*, 636-640.
- Frost, R. O., Heimberg, R. G., Holt, C. S., Mattia, J. I., & Neubauer, A. L. (1993). A comparison of two measures of perfectionism. *Personality and Individual Differences, 14*, 119-126.
- Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research, 14*, 449-468.
- Galdi, S., Gawronski, B., Arcuri, L., & Friese, M. (2012). Selective exposure in decided and undecided individuals: Differential relations to automatic

associations and conscious beliefs. *Personality and Social Psychology Bulletin*, 38, 559-569.

Gattis, M. N., Sacco, P., & Cunningham-Williams, R. M. (2012). Substance use and mental health disorders among heterosexual identified men and women who have same-sex partners or same-sex attraction: Results from the national epidemiological survey on alcohol and related conditions. *Archives of Sexual Behavior*, 41, 1185-1197.

Gawronski, B., Hofmann, W., & Wilbur, C. J. (2006). Are “implicit” attitudes unconscious? *Consciousness and Cognition*, 15, 485-499.

Gebauer, J. E., Riketta, M., Broemer, P., & Maio, G. R. (2008). “How much do you like your name?” An implicit measure of global self-esteem. *Journal of Experimental Social Psychology*, 44, 1346-1354.

Gosling, S. D., Rentfrow, P. J., & Swann, W. B., Jr. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality*, 37, 504-528.

Greenwald, A. G. (1968). Cognitive learning, cognitive response, to persuasion, and attitude change. In A. G. Greenwald, T.C. Brock, & T. M. Ostrom (Eds.), *Psychological foundations of attitudes* (pp. 147-170). San Diego, CA: Academic Press.

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review*, 102, 4-27.

Greenwald, A. G., & Farnham, S. D. (2000). Using the implicit association test to measure self-esteem and self-concept. *Journal of Personality and Social Psychology*, 79, 1022-1038.

- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal of Personality and Social Psychology*, 74, 1464-1480.
- Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the Implicit Association Test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology*, 85, 197-216.
- Griffin, K. M., & Sayette, M. A. (2008). Facial reactions to smoking cues relate to ambivalence about smoking. *Psychology of Addictive Behaviors*, 22, 551-556.
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, 85, 348-362.
- Gutiérrez, J. L. G., Jiménez, B. M., Hernández, E. G., & Puente, C. P. (2005). Personality and subjective well-being: Big five correlates and demographic variables. *Personality and Individual Differences*, 38, 1561-1569.
- Haas, A. P., Eliason, M., Mays, V. M., Mathy, R. M., Cochran, S. D., D'Augelli, A. R., ...Clayton, P. J. (2011). Suicide and suicide risk in lesbian, gay, bisexual, and transgender populations: Review and recommendations. *Journal of Homosexuality*, 58, 10-51.
- Haddock, G., & Gebauer, J. E. (2011). Defensive self-esteem impacts attention, attitude strength, and self-affirmation processes. *Journal of Experimental Social Psychology*, 47, 1276-1284.
- Han, H. A., Czellar, S., Olson, M. A., & Fazio, R. H. (2010). Malleability of attitudes or malleability of the IAT? *Journal of Experimental Social Psychology*, 46, 286-298.

- Han, H. A., Olson, M. A., & Fazio, R. H. (2006). The influence of experimentally created extrapersonal associations on the Implicit Association Test. *Journal of Experimental Social Psychology, 42*, 259-272.
- Hatzenbuehler, M. L., Dovidio, J. F., Nolen-Hoeksema, S., & Phillips, C. E. (2009). An implicit measure of anti-gay attitudes: Prospective associations with emotion regulation strategies and psychological distress. *Journal of Experimental Social Psychology, 45*, 1316-1320.
- Hatzenbuehler, M. L., Keyes, K. M., & McLaughlin, K. A. (2011). The protective effects of social/contextual factors on psychiatric morbidity in LGB populations. *International Journal of Epidemiology, 40*, 1071-1080.
- Hayes, N., & Joseph, S. (2003). Big 5 correlates of three measures of subjective well-being. *Personality and Individual Differences, 34*, 723-727.
- Heatherton, T. F., Kleck, R. E., Hebl, M. R., & Hull, J. G. (2000). *The Social Psychology of Stigma*. New York, NY: The Guilford Press.
- Heisel, M. J., & Mongrain, M. (2004). Facial expressions and ambivalence: Looking for conflict in all the right faces. *Journal of Nonverbal Behavior, 28*, 35-52.
- Herek, G. M., & Garnets, L. D. (2007). Sexual orientation and mental health. *Annual Reviews of Clinical Psychology, 3*, 353-375.
- Herek, G. M., & McLemore, K. A. (2013). Sexual prejudice. *Annual Review of Psychology, 64*, 309-333.
- Hofmann, W., Gawronski, B., Gschwendner, T., Le, H., & Schmitt, M. (2005). A meta-analysis on the correlation between the implicit association test and explicit self-report measures. *Personality and Social Psychology Bulletin, 31*, 1369-1385.

- Jarvis, W. B. G. (2008). DirectRT (Version 2008) [Computer software]. New York, NY: Empirisoft.
- Jonas, K., Diehl, M., & Bromer, P. (1997). Effects of attitudinal ambivalence on information processing and attitude-intention consistency. *Journal of Experimental Social Psychology*, 33, 190-210.
- Jordan, C. H., Spencer, S. J., Zanna, M. P., Hoshino-Browne, E., & Correll, J. (2003). Secure and defensive high self-esteem. *Journal of Personality and Social Psychology*, 85, 969-978.
- Jordan, C. H., Spencer, S. J., & Zanna, M. P. (2005). Types of high self-esteem and prejudice: How implicit self-esteem relates to ethnic discrimination among high explicit self-esteem individuals. *Personality and Social Psychology Bulletin*, 31, 693-702.
- Kaplan, K. (1972). On the ambivalence-indifference problem in attitude theory and measurement: A suggested modification of the semantic differentiation technique. *Psychological Bulletin*, 77, 361-372.
- Karpinski, A., & Steinman, R. B. (2006). The Single Category Implicit Association Test as a measure of implicit social cognition. *Journal of Personality and Social Psychology*, 91, 16-32.
- King, L. A. (1998). Ambivalence over emotional expression and reading emotions in situations and faces. *Journal of Personality and Social Psychology*, 74, 753-762.
- King, M., McKeown, E., Warner, J., Ramsay, A., Johnson, K., Cort, C., . . . Davidson, O. (2003). Mental health and quality of life of gay men and lesbians in England and Wales: Controlled, cross-sectional study. *British Journal of Psychiatry*, 183, 552-558.

- King, M., Semlyen, J., Tai, S. S., Killaspy, H., Osborn, D., Popelyuk, D., & Nazareth, I. (2008). A systematic review of mental disorder, suicide, and deliberate self harm in lesbian, gay and bisexual people. *BMC Psychiatry, 8*, Article 70.
- Kinsey, A. C., Pomeroy, W. B., & Martin, C. E. (1948). *Sexual behaviour in the human male*. Philadelphia: W. B. Saunders.
- Kleiman, S., & Rule, N. O. (2013). Detecting suicidality from facial appearance. *Social Psychological and Personality Science, 4*, 453-460.
- Klein, F., Sepekoff, B., & Wolf, T. J. (1985). Sexual orientation: A multi-variable dynamic process. *Journal of Homosexuality, 11*, 35-49.
- Laursen, B., Pulkkinen, L., & Adams, R. (2002). The antecedents and correlates of agreeableness in adulthood. *Developmental Psychology, 38*, 591-603.
- Lavine, H., Thomsen, C. J., Zanna, M. P., & Borgida, E. (1998). On the primacy of affect in the determination of attitudes and behaviour: The moderating role of affective-cognitive ambivalence. *Journal of Experimental Social Psychology, 34*, 389-421.
- Legate, N., Ryan, R. M., & Weinstein, N. (2011). Is coming out always a "good thing"? Exploring the relations of autonomy, support, outness, and wellness for lesbian, gay, and bisexual individuals. *Social Psychological & Personality Science, 1*, 1-8.
- Luce, M. F., Bettman, J. R., & Payne, J. W. (1997). Choice processing in emotionally difficult decisions. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 23*, 384-405.
- Lyubomirsky, S., & Lepper, H. S. (1999). A measure of subjective happiness: Preliminary reliability and construct validation. *Social Indicators Research, 46*, 137-155.

- Maio, G. R., Bell, D. W., & Esses, V. M. (1996). Ambivalence and persuasion: The processing of messages about immigrant groups. *Journal of Experimental Social Psychology, 32*, 513-536.
- Maio, G. R., Esses, V. M., & Bell, D. W. (2000). Examining conflict between components of attitudes: Ambivalence and inconsistency are distinct constructs. *Canadian Journal of Behavioral Science, 32*, 71-83.
- Maio, G. R., & Haddock, G. (2015). *The psychology of attitudes and attitude change* (2nd Ed.). London, England: SAGE.
- Mauss, I. B., Cook, C. L., Cheng, J. Y. J., & Gross, J. J. (2007). Individual differences in cognitive reappraisal: Experimental and physiological responses to an anger provocation. *International Journal of Psychophysiology, 66*, 116-124.
- Meyer, I. H. (1995). Minority stress and mental health in gay men. *Journal of Health and Social Behavior, 36*, 38-56.
- Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychological Bulletin, 129*, 674-697.
- Miller, C. T., Rothblum, E. D., Felicio, D., & Brand, P. (1995). Compensating for stigma: Obese and nonobese women's reactions to being visible. *Personality and Social Psychology Bulletin, 21*, 1093-1106.
- Monteith, M. J. (1996). Contemporary forms of prejudice-related conflict: In search of a nutshell. *Personality and Social Psychology Bulletin, 22*, 461-473.
- Morgan, E. M., Steiner, M. G., & Thompson, E. M. (2010). Processes of sexual orientation questioning among heterosexual men. *Men and Masculinities, 12*, 425-443.

- Morgan, E. M., & Thompson, E. M. (2011). Processes of sexual orientation questioning among heterosexual women. *Journal of Sex Research, 48*, 16-28.
- Newby-Clark, I., McGregor, I., & Zanna, M. P. (2002). Thinking and caring about cognitive inconsistency: When and for whom does attitudinal ambivalence feel uncomfortable? *Journal of Personality and Social Psychology, 82*, 157-166.
- Newcomb, M. E., & Mustanski, B. (2010). Internalized homophobia and internalizing mental health problems: A meta-analytic review. *Clinical Psychology Review, 30*, 1019-1029.
- Nordgren, L. F., van Harreveld, F., & van der Pligt, J. (2006). Ambivalence, discomfort, and motivated information processing. *Journal of Experimental Social Psychology, 42*, 252-258.
- Nosek, B. A. (2005). Moderators of the relationship between implicit and explicit evaluation. *Journal of Experimental Psychology: General, 134*, 565-584.
- Olson, M. A., & Fazio, R. H. (2004). Reducing the influence of extrapersonal associations on the implicit association test: Personalizing the IAT. *Journal of Personality and Social Psychology, 86*, 653-667.
- Pelham, B. W., & Swann, W. B., Jr. (1989). From self-consciousness to self-worth: On the sources and structure of global self-esteem. *Journal of Personality and Social Psychology, 82*, 672-680.
- Petty, R. E., & Cacioppo, J. T. (1979). Issue involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses. *Journal of Personality and Social Psychology, 37*, 1915-1926.

- Petty, R. E., & Cacioppo, J. T. (1984). The effects of involvement on responses to argument quantity and quality: Central and peripheral routes to persuasion. *Journal of Personality and Social Psychology*, 46, 69-81.
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. *Advances in Experimental Social Psychology*, 19, 123-162.
- Petty, R. E., Haugtvedt, C. P., & Smith, S. M. (1995). Elaboration as a determinant of attitude strength: Creating attitudes that are persistent, resistant, and predictive of behavior. In R. E. Petty, & J. A. Krosnick (Eds.), *Attitude strength: Antecedents and consequences* (pp. 93-130). Mahwah, NJ: Lawrence Erlbaum.
- Pinel, E. C. (1999). Stigma consciousness: The psychological legacy of social stereotypes. *Journal of Personality and Social Psychology*, 76, 114-128.
- Pratkanis, A. R., & Greenwald, A. G. (1993). Consumer involvement, message attention, and the persistence of persuasive impact in a message-dense environment. *Psychology & Marketing*, 10, 321-333.
- Priester, J. R., & Petty, R. E. (1996). The gradual threshold model of ambivalence: Relating the positive and negative bases of attitudes to subjective ambivalence. *Journal of Personality and Social Psychology*, 71, 431-449.
- Qualtrics. (2013). [Computer Software]. Provo, Utah: Qualtrics.
- Ray, R. D., Ochsner, K. N., Cooper, J. C., Robertson, E. R., Gabrielli, J. D. E., & Gross, J. J. (2005). Individual differences in trait rumination and the neural systems supporting cognitive reappraisal. *Cognitive, Affective, & Behavioral Neuroscience*, 5, 156-168.
- Rieger, G., & Savin-Williams, R. C. (2012). The eyes have it: Sex and sexual orientation differences in pupil dilation patterns. *PLoS ONE*, 7, e40256.

- Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Construct validation of a singleitem measure of the Rosenberg Self-Esteem scale. *Personality and Social Psychology Bulletin*, 27, 151-161.
- Rubin, M., Paolini, S., & Crisp, R. J. (2010). A processing fluency explanation of bias against migrants. *Journal of Experimental Social Psychology*, 46, 21-28.
- Rule, N. O. (2015). [Detecting sexual orientation from handwriting]. Unpublished raw data.
- Rule, N. O., Ambady, N., Adams, R. B., Macrae, C. N. (2008). Accuracy and awareness in the perception and categorization of male sexual orientation. *Journal of Personality and Social Psychology*, 95, 1019-1028.
- Rule, N. O., Ambady, N., & Hallett, K. C. (2009). Female sexual orientation is perceived accurately, rapidly, and automatically from the face and its features. *Journal of Experimental Social Psychology*, 45, 1245-1251.
- Rule, N. O., Krendl, A. C., Ivcevic, Z., Ambady, N. (2013). Accuracy and consensus in judgements of trustworthiness from faces: Behavioral and neural correlates. *Journal of Personality and Social Psychology*, 104, 409-426.
- Rydell, R. J., & Durso, G. R. O. (2012). Can I borrow a feeling? Spillover of negative arousal from inconsistent information during attitude formation diminishes perceptions of well-being. *Journal of Experimental Social Psychology*, 48, 575-578.
- Rydell, R. J., McConnell, A. R., & Mackie, D. M. (2008). Consequences of discrepant explicit and implicit attitudes: Cognitive dissonance and increased information processing. *Journal of Experimental Social Psychology*, 44, 1526-1532.

- Sandfort, T. G. M., de Graaf, R., Bijl, R. V., & Schnabel, P. (2001). Same-sex sexual behaviour and psychiatric disorders. *Archives of General Psychiatry*, 58, 85-91.
- Savin-Williams, R. C. (2006). Who's gay? Does it matter? *Current Directions in Psychological Science*, 15, 40-44.
- Savin-Williams, R. C., & Ream, G. L. (2007). Prevalence and stability of sexual orientation components during adolescence and young adulthood. *Archives of Sexual Behavior*, 36, 385-394.
- Schroder-Abe, M., Rudolph, A., & Schutz, A. (2007). High implicit self-esteem is not necessarily advantageous: Discrepancies between explicit and implicit self-esteem and their relationship with anger expression and psychological health. *European Journal of Personality*, 21, 319-339.
- Sell, R. L. (1997). Defining and measuring sexual orientation: A review. *Archives of Sexual Behavior*, 26, 643-658.
- Snowden, R. J., & Gray, N. S. (2013). Implicit sexual associations in heterosexual and homosexual women and men. *Archives of Sexual Behavior*, 42, 475-485.
- Snowden, R. J., Wichter, J., & Gray, N. S. (2008). Implicit and explicit measurements of sexual preferences in gay and heterosexual men: A comparison of priming techniques. *Archives of Sexual Behavior*, 37, 558-567.
- Steel, P. (2007). The nature of procrastination: A meta-analytic and theoretical review of quintessential self-regulatory failure. *Psychological Bulletin*, 133, 65-94.
- Suddarth, B. H., & Slaney, R. B. (2001). An investigation of the dimensions of perfectionism in college students. *Measurement and Evaluation in Counselling and Development*, 34, 157-165.

- Tajfel, H. (1970). Experiments in intergroup discrimination. *Scientific American*, 223, 96-102.
- Taylor, D. M., Wright, S. C., Moghaddam, R. M., & Lalonde, R. N. (1990). The personal/group discrimination discrepancy: Perceiving my group but not myself, to be a target of discrimination. *Personality and Social Psychology Bulletin*, 16, 254-262.
- Tett, R. P., & Palmer, C. A. (1997). The validity of handwriting elements in relation to self-report personality trait measures. *Personality and Individual Differences*, 22, 11-18.
- Thompson, M., Zanna, M., & Griffin, D. (1995). Let's not be indifferent about (attitudinal ambivalence). In R. E. Petty, & J. A. Krosnick (Eds.), *Attitude Strength* (pp. 361-386). Mahwah, NJ: Lawrence Erlbaum Associates.
- Treynor, W., Gonzalez, R., & Nolen-Hoeksema, S. (2003). Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research*, 27, 247-259.
- Tskhay, K. O., Re, D. E., & Rule, N. O. (2014). Individual differences in perceptions of gay men's sexual role preferences from facial cues. *Archives of Sexual Behavior*, 43, 1615-1620.
- Tskhay, K. O., & Rule, N. O. (2013). Accurate identification of a preference for insertive versus receptive intercourse from static facial cues of gay men. *Archives of Sexual Behavior*, 42, 1217-1222.
- Ullrich, P. M., Lutgendorf, S. K., & Stapleton, J. T. (2003). Concealment of homosexual identity, social support and CD4 cell count among HIV-seropositive gay men. *Journal of Psychosomatic Research*, 54, 205-212.
- van Harreveld, F., Rutjens, B. T., Rotteveel, M., Nordgren, L. F., & van der Pligt, J. (2009a). Ambivalence and decisional conflict as a cause of psychological

- discomfort: Feeling tense before jumping off the fence. *Journal of Experimental Social Psychology*, 45, 167-173.
- van Harreveld, F., van der Pligt, J., & de Liver, Y. N. (2009b). The agony of ambivalence and ways to resolve it: Introducing the MAID model. *Personality and Social Psychology Review*, 13, 45-61.
- van Harreveld, F., van der Pligt, J., de Vries, N. K., Wenneker, C., & Verhue, D. (2004). Ambivalence and information integration in attitudinal judgement. *British Journal of Social Psychology*, 43, 431-447.
- Vrangalova, Z., & Savin-Willaims, R. C. (2012). Mostly heterosexual and mostly gay/lesbian: Evidence for new sexual orientation identities. *Archives of Sexual Behavior*, 41, 85-101.
- Wamala, S., Boström, G., & Nyqvist, K. (2007). Perceived discrimination and psychological distress in Sweden. *British Journal of Psychiatry*, 190, 75-76.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063-1070.
- Weinstein, N., Ryan, W. S., DeHaan, C. R., Przybylski, A. K., Legate, N., & Ryan, R. M. (2012). Parental autonomy support and discrepancies between implicit and explicit sexual identities: Dynamics of self-acceptance and defence. *Journal of Personality and Social Psychology*, 102, 815-832.
- Wilson, J. P., & Rule, N. O. (2014). Perceptions of others' political affiliation are moderated by individual perceivers' own political attitudes. *PLOS ONE*, e95431.
- Windsor-Shellard, B. (2011). Using a personalized IAT to detect sexual identity and attitudes towards one's sexual orientation (Master's Thesis).

- Windsor-Shellard, B., & Haddock, G. (2014). On feeling torn about one's sexual orientation: The effects of explicit-implicit sexual orientation ambivalence. *Personality and Social Psychology Bulletin, 40*, 1215-1228.
- Wright, L. W., Jr., Adams, H. E., & Bernat, J. (1999). Development and validation of the Homophobia Scale. *Journal of Psychopathology and Behavioral Assessment, 21*, 337-347.
- Ziegler-Hill, V., & Terry, C. (2007). Perfectionism and explicit self-esteem: The moderating role of implicit self-esteem. *Self and Identity, 6*, 137-153.

Appendices

Appendix 1: Explicit measure of SO

In this task you will see a number of statements and you will need to respond using the scale above. Use the numbered keys at the top of the keyboard to respond. By choosing 1 you are indicating that something is definitely not reflective of you. Choosing 9 on the other hand means that something definitely is reflective of you. If you do not wish to respond, hit the space bar.

Response scale

1	2	3	4	5	6	7	8	9
Definitely not me								Definitely me

Measure items

I find men attractive	I find women attractive
I fancy men	I fancy women
I have sex with men	I have sex with women
I prefer intimate relationships with men	I prefer intimate relationships with women
Romance with men is normal for me	Romance with women is normal for me

Appendix 2: Implicit measure of SO

At the beginning of the each experimental procedure, participants provided the following demographical information “to be used in a later stage of the study.” This information comprised the “ME” component of the categorisation task. Words representing a fictitious character fulfilled the “NOT ME” component.

Words representative of the participant (“ME”)	Words of a fictitious character (“NOT ME”)
My birth-date (Day-Month)	February 30 th
My first name	Beatrix
A city/town/ area that I strongly associate myself with	Caracas
My surname	Friedman
A street/ road name where I live/ have lived	Balmoral Road
My year of birth	1972

Images of gay couples (IF FEMALE)



Images of gay couples (IF MALE)



Images of straight couples



Stage 1

Instructions:

In the following categorisation task you will need to make a number of judgements as QUICKLY and as ACCURATELY as possible. A picture OR word shall be presented in the centre of the screen. You then need to respond by hitting either key E or key I. These keys correspond to the category labels, like those above, at the top of the screen. Key E will always correspond to the label on the LEFT and key I will always correspond to the label on the RIGHT.

For example (in the context of the labels above), hitting key E would indicate that a picture is of a gay couple, whereas hitting key I would indicate that a picture is of a straight couple. At each stage be sure to study the category labels closely as these change.

Keep your index fingers on keys E and I throughout, so that you can make your judgements as quickly and as accurately as possible.

****When you are ready, and have studied the category labels, press Space****

Category labels:



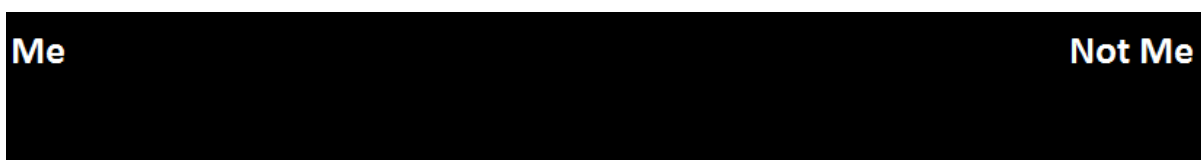
Stage 2

Instructions:

You now have to complete the same task, however the stimuli and category labels (see above) have now changed. Key E corresponds to (me) words that are representative of you; key I corresponds to (not-me) words that are not representative of you.

****Press Space when ready to continue****

Category labels:



Stage 3

Instructions:

At this stage, the category labels (above) are now combined. This means that key E now corresponds to pictures of gay couples and (me) words that are representative of you. Similarly key I corresponds to pictures of straight couples and (not-me) words that are not representative of you.

****When you are ready, and have studied the category labels, press Space****

Category labels:

Gay	Straight
OR	OR
Me	Not Me

Stage 4

Instructions:

This stage now repeats a previous stage, however the category labels have changed slightly.

****When you are ready, and have studied the category labels, press Space****

Category labels:

Not Me	Me
---------------	-----------

Stage 5

Instructions:

As with a previous stage, the category labels above are now combined. Key E corresponds to images of gay couples and (not-me) words that are not representative of you. Key I corresponds to pictures of straight couples and (me) words that are representative of you.

****When you are ready, and have studied the category labels, press Space****

Category labels:

Gay	Straight
OR	OR
Not Me	Me

Appendix 3: Life satisfaction measure (Diener et al., 1985)

For the following, respond using the scale above. A score of 1 means that you strongly disagree and a score of 9 means that you strongly agree.

Response scale

1	2	3	4	5	6	7	8	9
Strongly disagree								Strongly agree

Measure items

1. In most ways my life is close to my ideal
2. The conditions of my life are excellent
3. I am satisfied with my life
4. So far I have gotten the important things I want in life
5. If I could live my life over, I would change almost nothing

Appendix 4: Happiness Measure (Lyubomirsky & Lepper, 1999)

For the following items, please be aware that the response scale may change

1. *"In general, I consider myself..."*

1	2	3	4	5	6	7	8	9
...Not a very happy person								...A very happy person

2. *"Compared to my peers, I consider myself..."*

1	2	3	4	5	6	7	8	9
...Less Happy								...More happy

3. *"Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterisation describe you?"*

4. *"Some people are generally not very happy. Although they are not depressed, they never seem as happy as they might be. To what extent does this characterisation describe you?" **

1	2	3	4	5	6	7	8	9
Not at all								Very much

* Reverse coded

Appendix 5: Reappraisal and Suppression (Gross & John, 2003)

For the following, respond using the scale above. A score of 1 means that you strongly disagree and a score of 9 means that you strongly agree.

Response scale

1	2	3	4	5	6	7	8	9
Strongly disagree								Strongly agree

Reappraisal items

1. I control my emotions by changing the way I think about the situation I'm in
2. When I want to feel less negative emotion, I change the way I'm thinking about the situation
3. When I want to feel more positive emotion, I change the way I'm thinking about the situation
4. When I want to feel more positive emotion (such as joy or amusement), I change what I am thinking about
5. When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about
6. When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm

Suppression items

1. I control my emotions by not expressing them
2. When I am feeling negative emotions, I make sure not to express them
3. I keep my emotions to myself
4. When I am feeling positive emotions, I am careful not to express them

Appendix 6: Rumination measure (Treyner et al., 2003)

In this part of the study, you will see a number of statements assessing your wellbeing. As with before, respond using the scale above. 1 here means that something almost never happens, whereas 9 means that something almost always happens to you.

Response scale

1	2	3	4	5	6	7	8	9
Almost never happens								Almost always happens

Measure items

1. I think "what am I doing to deserve this?"
2. I analyse recent events and try to understand why I feel the way I do
3. I think "why do I always react in this way?"
4. I go away by myself to think about why I feel the way I do
5. I write down what I am thinking and I analyse what I have written
6. I think about a recent situation wishing that it had gone better
7. I think "why do I have problems other people don't have?"
8. I think "why can't I handle things better?"
9. I analyse my personality and try to understand why I feel the way I do
10. I go some place alone to think about my feelings

Appendix 7: Self-identity measures (Cameron, 2004)

For the following items, respond using the scale above. A score of 1 means that you strongly disagree, whereas a score of 9 means that you strongly agree.

Response scale

1	2	3	4	5	6	7	8	9
Strongly disagree								Strongly agree

Centrality items

1. I often think about the fact that I am (**)
2. Overall, being (**) has very little to do with how I feel about myself*
3. In general, being (**) is an important part of my self-image
4. The fact that I am (**) rarely enters my mind*
5. I am not usually conscious of the fact that I am (**)*
6. Being (**) is an important reflection of who I am
7. In my everyday life, I often think about what it means to be (**)

Affect items

1. In general, I am glad to be (**)
2. I often regret that I am (**)*
3. I don't feel good about being (**)*
4. Generally, I feel good when I think about myself as being (**)
5. Just thinking about the fact that I am (**) sometimes gives me bad feelings*

Ties items

1. I have a lot in common with other (**) people
2. I feel strong ties to other (**) people
3. I find it difficult to form a bond with other (**) people*
4. I don't feel a sense of being "connected" with other (**) people*
5. I really "fit in" with other (**) people
6. In a group of (**) people, I really feel that I belong

* Reverse coded

** Participants' respective SO placed here

Appendix 8: Manipulation of topic relevance (Study 3)

Information that is relevant to sexual orientation

The UK has always been notorious for its progressive policies; the legalisation of gay marriage is the next step in this process. At present, while a gay couple may form a civil partnership they are not legally allowed to be married. At face value this seems unfair, however others would argue that legally there is very little difference between a civil partnership and marriage.

However, the fact that gay and non-gay individuals cannot tie the knot in the same way is incompatible with the UK as state of equal opportunity. In an interview the CEO of a leading UK gay rights charity (Stonewall UK), Jason Allanach, informed the BBC that "denying same-sex couples the right to marry serves to stigmatise and not to equalise." Presently, gay couples can legally adopt, however the denial of marriage "stigmatises gay and lesbian families as inferior and sends out the message that it is acceptable to discriminate against them."

Many would also argue that equality in marriage would go against tradition and for this reason it should not happen. However, there is no such thing as a "traditional marriage." Furthermore, half a century of anthropological research has shown no support for the view that either civilisation or viable social order depend upon marriage as an exclusively heterosexual institution. Rather, research supports the conclusion that a vast array of family types, including families built upon same-sex partnerships, can contribute to stable and humane societies.

Not only is equality in marriage common sense, it is also necessary to promote well-being. Recent psychological research, endorsed by the American Psychological Association, has suggested that marriage provides both physical and psychological health benefits, whereas the refusal of marriage to same-sex couples has resulted in harmful psychological effects such as depression. In light of such research, the benefits of equality in marriage are abundantly clear.

Information that is not relevant to sexual orientation

The UK has always been notorious for its progressive policies; the legalisation of gay marriage is the next step in this process. At present, while a gay couple may form a civil partnership they are not legally allowed to be married. At face value this seems unfair, however others would argue that legally there is very little difference between a civil partnership and marriage.

However, with the recent introduction of civil partnerships an additional burden has been placed on the already struggling UK registry offices. In an interview, the former deputy head of the UK association of registry offices (REGIS-UK), Jason Allanach informed Channel 5 that "in the present economic climate, equal marriage could help to reduce the present strain on registry offices and could help to reduce waiting-list times in many areas." Marriage equality will allow gay individuals to get married in institutions other than registry offices, such as churches, and will therefore reduce the necessity to increase the number of registry offices.

In addition to saving the state money, equality in marriage can bring a small financial gain to state and local governments. Additional income shall come from marriage licences and decreases in costs for state benefit programs. On account of states that have enforced equal marriage in the US, research has suggested that this would bring on average \$1.6 million (less than £1 million) to the economy across all of Britain.

To further add to these arguments, equal marriage could be beneficial in relation to inheritance tax. When you die there is a maximum amount that can be passed without paying inheritance tax. Married couples have the ability to transfer their remaining money to the other party. In addition, any gifts between each other pass without having to pay inheritance tax. The legalisation of equal marriage is therefore important for the financial security of couples.

Appendix 9: Anti-gay attitude measure (Study 3; Wright et al., 1999)

The following questions are designed to measure your thoughts, feelings, and behaviours towards gay men and women. It is not a test, so there are no right or wrong answers. Respond using the scale above; a score of 1 means that you strongly disagree whereas a score of 9 means that you strongly agree.

Response scale

1	2	3	4	5	6	7	8	9
Strongly disagree								Strongly agree

Measure items

1. Gay people make me nervous
2. Gay people deserve what they get
3. Homosexuality is acceptable to me*
4. If I discovered a friend was gay I would end the friendship
5. I think homosexual people should not work with children
6. I make derogatory remarks about gay people
7. I enjoy the company of gay people*
8. Marriage between homosexual individuals is acceptable
9. I make derogatory remarks like "faggot" or "queer" to people I suspect are gay
10. It does not matter to me whether my friends are gay or straight*
11. It would not upset me if I learned that a close friend was gay*
12. Homosexuality is immoral
13. I tease and make jokes about gay people
14. I feel that you cannot trust a person who is homosexual
15. I fear homosexual persons will make sexual advances towards me
16. Organisations which promote gay rights are necessary*
17. I have damaged property of gay persons, such as "keying" their cars
18. I would feel comfortable having a gay flat-mate*
19. I would hit a homosexual for coming on to me
20. Homosexual behaviour should not be against the law
21. I avoid gay individuals
22. It does not bother me to see two homosexual people together in public*
23. When I see a gay person I think, "What a waste"
24. When I meet someone I try to find out if he/she is gay
25. I have rocky relationships with people that I suspect are gay

* Reverse coded

Appendix 10: Evaluation of one’s SO measures

Explicit measure

This was the affect facet of the self-identity measure. Please see Appendix 7.

Implicit measure

These words comprised the “positive” and “negative” components of the categorisation task.

Positive	Negative
Happiness	Abuse
Diamond	Assault
Glory	Corpse
Joy	Death
Peace	Killer
Warmth	Poison
Smile	Stink
Health	Torture
Luck	Agony
Gold	Vomit

Straight couples



Gay couples (IF FEMALE)



Gay couples (IF MALE)



Stage 1

Instructions:

The following task has the same procedure as the last (the implicit measure of sexual orientation preceded this IAT), however the category labels and stimuli are now completely different.

In the context of the labels above, pressing key E now indicates that you feel an image is representative of your sexual orientation. Pressing key I means that you feel an image is not representative of your sexual orientation.

****Press Space to continue****

Category labels:

My Sexual Orientation	Not My Sexual Orientation

Stage 2

Instructions:

You now have to complete the same task, however the stimuli and category labels (see above) have now changed. Key E corresponds to positive words; key I corresponds to negative words.

****Press Space when ready to continue****

Category labels:

Positive	Negative

Stage 3

Instructions:

At this stage, the category labels (above) are now combined. This means that key E now corresponds to pictures that you feel are representative of your sexual orientation and positive words. Key I corresponds to pictures that you feel are not representative of your sexual orientation and negative words.

****When you are ready, and have studied the category labels, press Space****

Category labels:

My Sexual Orientation	Not My Sexual Orientation
OR	OR
Positive	Negative

Stage 4

Instructions:

This stage now repeats a previous stage, however the category labels have changed slightly.

****When you are ready, and have studied the category labels, press Space****

Category labels:

Negative	Positive
-----------------	-----------------

Stage 5

Instructions:

At this stage, the category labels (above) are now combined. This means that key E corresponds to images that you feel are representative of your sexual orientation and negative words. Key I corresponds to images that you feel are not representative of your sexual orientation and positive words.

****When you are ready, and have studied the category labels, press Space****

Category labels:

My Sexual Orientation	Not My Sexual Orientation
OR	OR
Negative	Positive

Appendix 11: Positive and negative affect scales (PANAS, Study 5; Watson et al., 1988)

Below are a number of words that describe different feelings and emotions. Read each item and then mark the extent to which you generally feel...

Response scale

1	2	3	4	5
Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1. Interested				
2. Distressed*				
3. Excited				
4. Upset*				
5. Strong				
6. Guilty*				
7. Scared*				
8. Irritable*				
9. Alert				
10. Ashamed*				
11. Inspired				
12. Nervous*				
13. Determined				
14. Attentive				
15. Jittery*				
16. Active				
17. Afraid*				

* Reverse coded

Appendix 12: Measures of discrimination on the basis of SO (Study 5; FRA, 2013)

Group-level discrimination

For the following items about discrimination on the basis of being a gay man or a gay woman in the UK, respond using the scale below. 1 means that you believe something is *not at all widespread*; 9 means that you believe that something is *very widespread*.

Response scale

1	2	3	4	5	6	7	8	9
NOT at all widespread								Very widespread

Measure items

1. How widespread are casual jokes in everyday life about gay individuals?
2. How widespread are expressions of hatred and aversion towards gay individuals?
3. How widespread are assaults and harassment of gay individuals?
4. How widespread is discrimination on the grounds of sexual orientation?
5. How widespread is discrimination because a person is a gay man?
6. How widespread is discrimination because a person is a gay woman?

Discrimination experienced within the past 12-months

The following six items ask about discrimination that has been experienced by you personally on the basis of being a gay man/woman. Please answer these questions bearing in mind the past 12 months only. A score of 1 means that you *strongly disagree* with an item; a score of 9 means that you *strongly agree* with an item.

Response scale

1	2	3	4	5	6	7	8	9
Strongly disagree								Strongly agree

Measure items

1. I have felt discriminated against or harassed on the grounds of my sexual orientation
2. I have felt discriminated or harassed because of being perceived as gay
3. I have felt discriminated against because of being gay when looking for a job

4. I have felt discriminated against because of being gay at work
5. I have felt discriminated against because of being gay at a shop
6. I have felt discriminated against because of being gay at a fitness club/gym

Discrimination experienced more than 12-months ago

The following questions are the same as those answered previously. However, this time answer bearing in mind any discrimination that has ever been experienced but more than 1 year ago.

The measure is the same as that described previously.

Appendix 13: Multidimensional perfectionism scale (Study 5; Frost et al., 1990)

Below are a number of statements; using the scale, indicate your agreement with each. A score of 1 means that you *strongly disagree* whereas a score of 9 means that you *strongly agree*.

Response scale

1	2	3	4	5	6	7	8	9
Strongly disagree								Strongly agree

1. If I fail at work, I am a failure as a person
2. I should be upset if I make a mistake
3. If someone does a task at work better than I, then I feel like I failed the whole task
4. If I fail partly, it is as bad as being a complete failure
5. I hate being less than the best at things
6. People will probably think less of me if I make a mistake
7. If I do not do as well as other people, it means that I am an inferior human being
8. If I do not do well all the time, people will not respect me
9. The fewer mistakes I make, the more people will like me
10. Even when I do something very carefully, I often feel that it is not quite right
11. I usually have doubts about the simple things I do
12. I tend to get behind in work because I repeat things over and over
13. It takes me a long time to do something "right"
14. My parents set very high standards for me
15. My parents wanted me to do the best at everything
16. Only outstanding performance is good enough in my family
17. My parents have expected excellence from me
18. My parents have always had higher expectations for my future than I have
19. As a child I was punished for doing things less than perfect
20. My parents never tried to understand my mistakes
21. I never felt like I could meet my parents' expectations
22. I never felt like I could meet my parents' standards
23. If I do not set the highest standards for myself, I am likely to end up a second-rate person
24. It is important to me that I am thoroughly competent in everything that I do
25. I set higher goals than most people
26. I am very good at focusing my efforts on attaining a goal
27. I have extremely high goals
28. Other people seem to accept lower standards than I do
29. I expect higher performance in my daily tasks than most people
30. Organisation is very important to me

- 31. I am a neat person
- 32. I try to be an organised person
- 33. I try to be a neat person
- 34. Neatness is very important to me
- 35. I am an organised person

Appendix 14: Actual-ideal discrepancy measure (Study 5; Pelham & Swann, 1989)

Actual component

Written below are 10 different attributes. Using the scale below indicate how certain you are about your standing on each one.

A score of 1 means that you are *not at all certain* about your standing on a particular attribute.

A score of 5 means that you are *moderately certain* about your standing on a particular attribute.

A score of 9 means that you are *extremely certain* about your standing on a particular attribute.

Response scale

1	2	3	4	5	6	7	8	9
Not at all certain				Moderately certain				Extremely certain

Measure items

1. Intellectual ability
2. Social skills/competence
3. Artistic/ musical ability
4. Ability in doing sport
5. Physical attractiveness
6. Leadership ability
7. Common sense
8. Emotional stability
9. Luck
10. Discipline

Ideal component

Written below are the same 10 attributes. This time, instead of indicating your standing on each one, we would like to know where you would ideally like to fall on each of these attributes.

A score of 1 means that a given attribute is *not reflective* of your ideal self.

A score of 5 means that a given attribute is *partially reflective* of your ideal self.

A score of 9 means that a given attribute is *very reflective* of your ideal self.

Response scale

1	2	3	4	5	6	7	8	9
Not reflective of idea self				Partially reflective of idea self				Very reflective of idea self

Measure items

11. Intellectual ability
12. Social skills/competence
13. Artistic/ musical ability
14. Ability in doing sport
15. Physical attractiveness
16. Leadership ability
17. Common sense
18. Emotional stability
19. Luck
20. Discipline

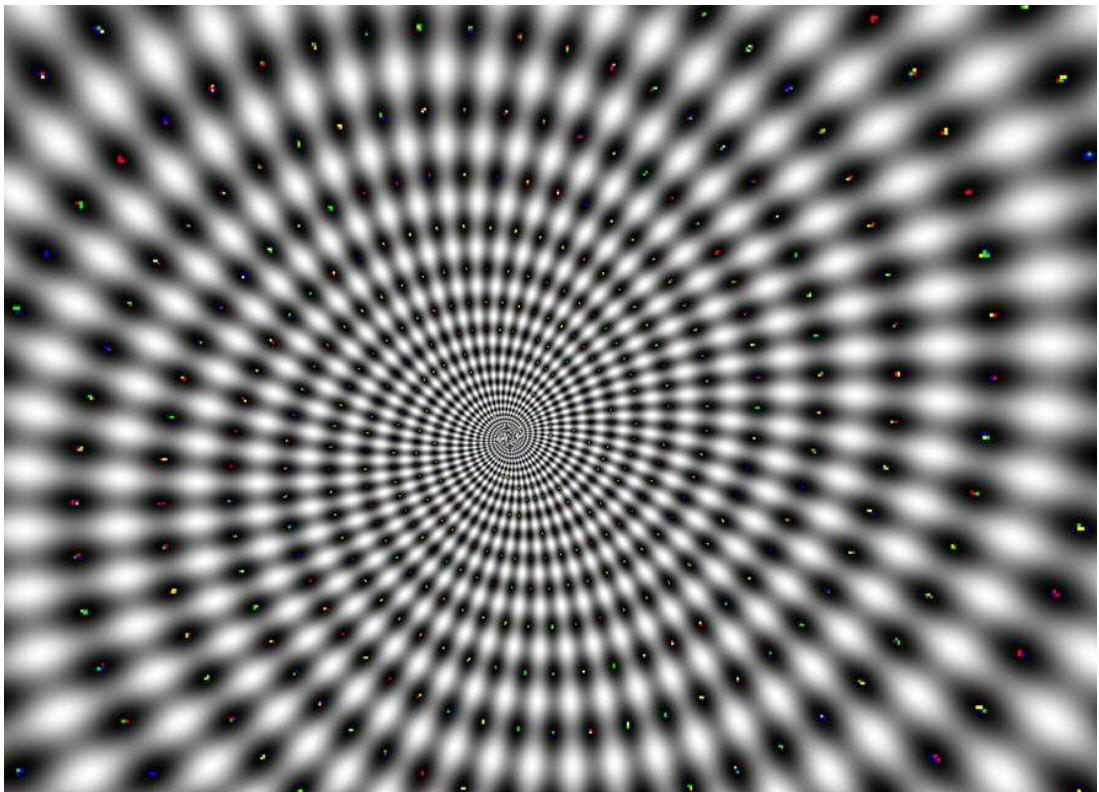
Appendix 15: Out-group discrimination measure (Study 5; Jordan et al., 2003; Tajfel, 1970).

“Group selection”

Participants completed three tasks, and were told that their performance would allocated them to a particular group.

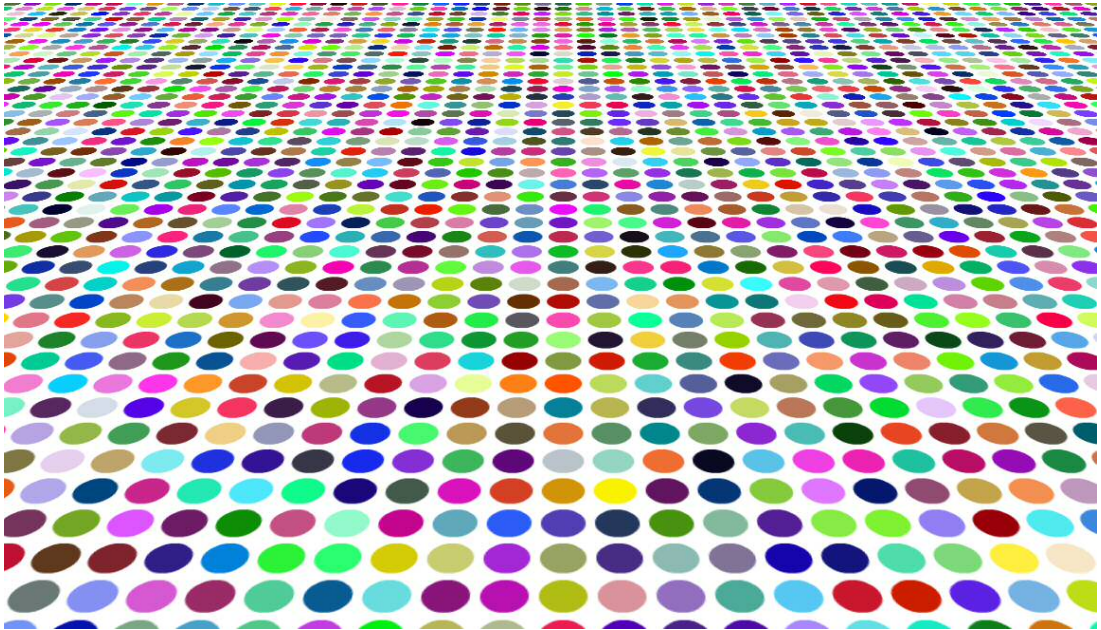
Task one

Select an area of the image that stands out the most.



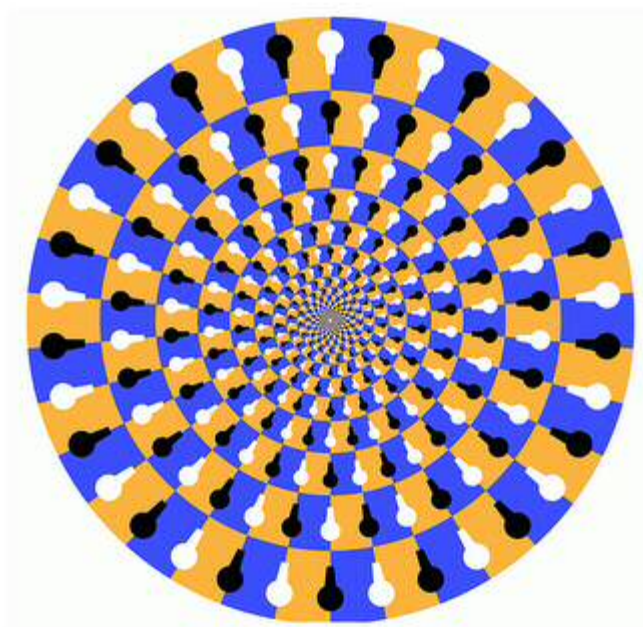
Task two

Estimate the number of pink dots in the image.



Task three

Does the direction of the wheel move clockwise, anticlockwise, or can you not tell?



Minimal group paradigm

The numbers in the matrix below represent rewards *and* penalties that can be given to the individuals listed on the left. In the following tasks *select a column of your choice* to distribute the rewards/penalties. For example, by selecting "column A" a random member in your group (i.e., Group A) would receive a penalty of -19 points, while a random member of Group B would receive a reward of 6 points. Please note, your decision will not affect your own chances of winning the prize.

Response Scale

Points allocated A B C D E F G H I J K L M N*

○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ●

* Example, selected choice

Example of A/B matrix

Individual from...	A	B	C	D	E	F	G	H	I	J	K	L	M	N
...Group A	-19	-16	-13	-10	-7	-4	-1	0	1	2	3	4	5	6
...Group B	6	5	4	3	2	1	0	-1	-4	-7	-10	-13	-16	-19

Example of A/A matrix

Individual from...	A	B	C	D	E	F	G	H	I	J	K	L	M	N
...Group A	12	10	8	6	4	2	0	-1	-5	-9	-13	-17	-21	-25
...Group A	-25	-21	-17	-13	-9	-5	-1	0	2	4	6	8	10	12

Example of B/B matrix

Individual from...	A	B	C	D	E	F	G	H	I	J	K	L	M	N
...Group B	1	2	3	4	5	6	7	8	9	10	11	12	13	14
...Group B	14	13	12	11	10	9	8	7	6	5	4	3	2	1

Appendix 16: Mindful attention awareness scale (MAAS, Study 5; Brown & Ryan, 2003)

Below is a collection of statements about your everyday experience. Using the scale below, please indicate how frequently or infrequently you have had each experience within the last month. Please answer according to what really reflects your experience rather than what you think your experience should be.

Response scale

1	2	3	4	5	6
Almost always	Very frequently	Somewhat frequently	Somewhat infrequently	Very frequently	Almost never

Measure items

1. I could be experiencing some emotion and not be conscious of it until some time later
2. I break or spill things because of carelessness, not paying attention, or thinking of something else
3. I find it difficult to stay focused on what is happening in the present
4. I tend to walk quickly to get where I'm going without paying attention to what I experience along the way
5. I tend not to notice feelings of physical tension or discomfort until they really grab my attention
6. I forget a person's name almost as soon as I've been told it for the first time
7. It seems I am "running on automatic" without much awareness of what I'm doing
8. I rush through activities without being really attentive to them
9. I get so focused on the goal I want to achieve that I lose touch with what I am doing right now to get there
10. I do jobs or tasks automatically, without being aware of what I am doing
11. I find myself listening to someone with one ear, doing something else at the same time
12. I drive places on "automatic pilot" and wonder why I went there
13. I find myself preoccupied with the future or past
14. I find myself doing things without paying attention
15. I snack without being aware of what I am eating

Appendix 17: Big-Five personality constructs (Study 5; Gosling et al., 2003)

Below are a number of personality traits that may or may not apply to you. Please indicate for each statement the extent to which *you agree or disagree with that statement*. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.

Response scale

1	2	3	4	5	6	7	8	9
Strongly disagree								Strongly agree

Measure items

1. Extroverted, enthusiastic*
2. Critical, quarrelsome*
3. Dependable, self-disciplined
4. Anxious, easily upset*
5. Open to new experiences, complex
6. Reserved, quiet
7. Sympathetic, warm
8. Disorganised, careless*
9. Calm, emotionally stable
10. Conventional, uncreative*

* Reverse scored

Extraversion: 1, 6

Agreeableness: 2, 7

Conscientiousness: 3, 8

Emotional stability: 4, 9

Openness to experiences: 5, 10