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Mood and Memory: Explanations and Exploration

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Last but not least, thank you to my closest friends and family for supporting me throughout the course.

Overview

The portfolio has three parts. The first two parts, two articles, concern the interaction of mood and cognitive processes, particularly memory and judgment. Part one is a systematic literature review, in which the empirical literature relating to the Affect Infusion Model (AIM; Forgas, 1995) was reviewed. The AIM is a model of affective influences in social judgment. Twenty-four papers were included in the review, covering a wide range of topics. The AIM was supported by all but three of the articles, suggesting that it is empirically validated. However, burgeoning research in the area of specific emotions and in clinical populations challenges the usefulness of the model and amendments are needed to integrate these fields.

Part two is an empirical paper, a comparison of mood effects on memory processes in bipolar disorder and normal controls, testing mood effects on recall, recognition and perception of memories. Previous studies have found that mood can affect what is recalled and how retrieved information is perceived. Fifty-eight participants, 28 participants with bipolar I disorder and 30 controls with no mental health problems took part. They saw mood-inducing film clips and completed a number of memory tasks. The mood state of participants significantly affected subsequent recognition of inkblots, matched mood aiding the clinical group but not the control group. In addition, mood affected how the self was perceived in memories. These findings add to the literature investigating cognitive differences in mood disorders. Part three comprises the appendixes. This part contains some information from the literature review, information about ethical approval and further details of statistical analyses and materials used in the empirical paper.

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PART ONE: SYSTEMATIC LITERATURE REVIEW

A Systematic Review of the Recent Evidence Testing the Affect Infusion Model

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This paper is written in the format ready for submission to Cognition and Emotion.

Please see Appendix 4 for the Guideline for Authors.

Word count: 12026

Abstract

This paper examines the recent evidence supporting and refuting the Affect Infusion Model (AIM; Forgas, 1995). One hundred and thirty-three papers referencing the AIM were identified by computer searches of 4 databases (including MEDLINE and PsychINFO). Twenty-four experimental papers were suitable for inclusion in the review. The articles identified covered a broad range of experimental fields. All but 3 of the papers supported AIM predictions. The AIM has made a substantial contribution to the research and theoretical area. However, future research needs to directly compare theoretical approaches and integrate the burgeoning research into the role of specific emotions. There would also be substantial value in investigating how these memory processes differ in clinical populations.

A Systematic Review of the Recent Evidence Testing the Affect Infusion Model

Throughout history, philosophers and psychologists have been trying to understand the interrelation between cognition, conation and emotion. The division between these processes is important but also hard to define. This review concentrates on the research supporting a particular theory of cognition and emotion that is intended to explain how moods or emotions can affect interpersonal behaviour, the Affect Infusion Model (AIM: Bower & Forgas, 2000; Forgas, 1995; Forgas, 2002a). The introduction introduces the broad structure and principles of the AIM before elaborating on why it was chosen for review, including some issues highlighted in the literature.

The Affect Infusion Model

The AIM (Forgas, 1995, 2002a) is an attempt to integrate contemporary theories of mood and cognition into a comprehensive account of social behaviour. It tries to specify "the circumstances under which valence effects, motivational effects, or appraisal effects are most likely to occur" (Forgas, 1995, p.39). In the model, the likelihood of mood affecting judgments is determined by the way information is processed.

Forgas (1995) refers to mood effects as *affect infusion*, defined as, "the process whereby affectively loaded information exerts an influence on and becomes incorporated into judgmental process, entering the judge's deliberations and eventually colouring the judgmental outcome" (Forgas, 1995, p.39). The AIM predicts that the biggest determinant of affect infusion is the processing strategy used by the judge. The processing strategy employed is contingent upon three main contextual variables: features of the target, the judge and the situation (Figure 1).

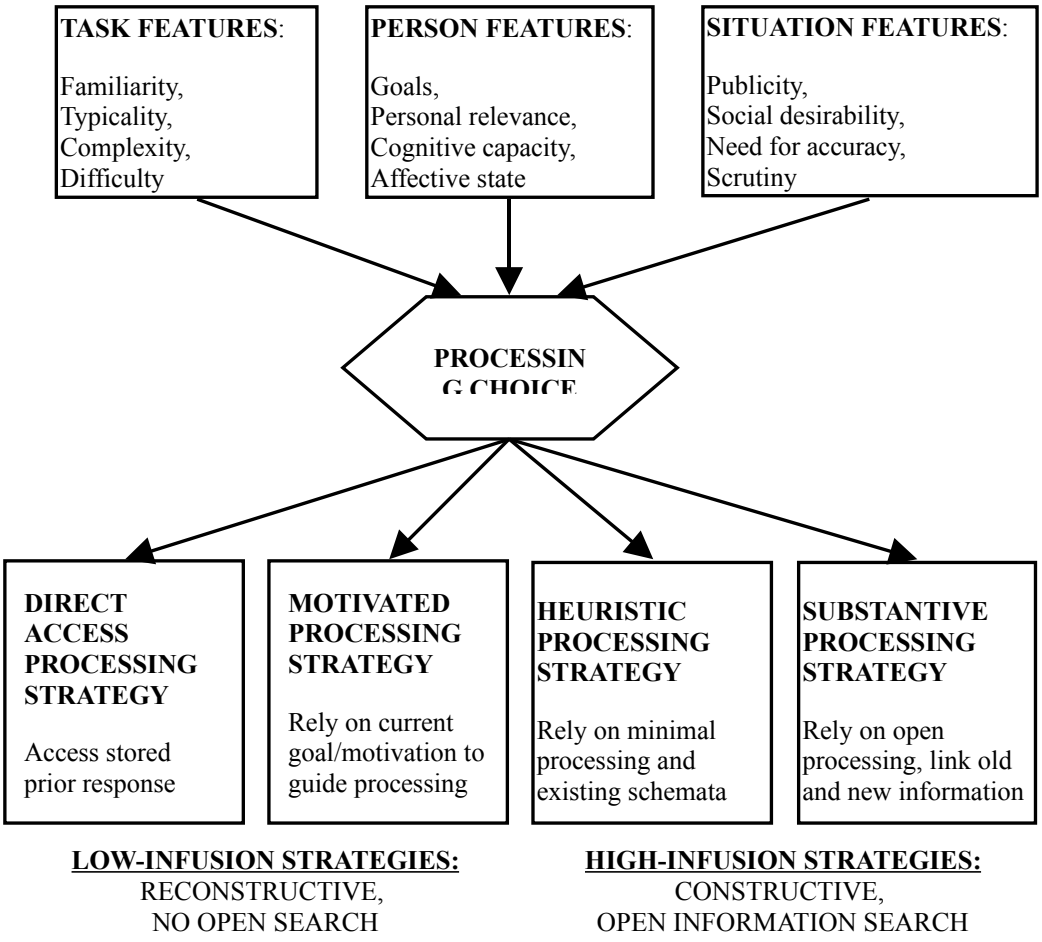

Figure 1. Outline of the multiprocess Affect Infusion Model (AIM). From *Handbook of Affect and Social Cognition* (p.106), Bower and Forgas (2001).

Target features that may affect processing strategy include how familiar the target is, the complexity of the task and how common or typical it is. Aspects of the judge that affect processing can be personality variables (Rusting, 2001), the level of personal involvement in the task, level of motivation, affective state and cognitive capacity (Forgas, 1995). Situational variables might be demand characteristics or "confidentiality" (Forgas, 1995, p.46). Within these bounds, Forgas (1995) makes the assumption that judges are "cognitive miser[s]" (p.46), using the least effortful

processing strategy.

Forgas (1995) describes four processing strategies: *direct access*, *motivated*, *heuristic* and *substantive*. These differ in "the level of effort exerted seeking a solution and the degree of openness and constructiveness of the information search strategy" (Forgas, 2002a, p.8). The degree of openness determines the level of affect infusion. Direct access processing (low effort, not open) is used to make judgments about highly familiar and typical targets. Motivated processing (high effort, not open) is used when the judge has a specific goal in the judgment. This may be, for example, mood repair (Erber & Erber, 2001) or fear of causing offence (Ciarrochi & Forgas, 1999). These two processing styles are predicted to result in no affect infusion or paradoxical, mood incongruent effects.

Affect infusion is hypothesised to occur when heuristic or substantive processes are used. Heuristic processing (low effort, open) is based on the Affect-As-Information account (Clore et al., 2001; Schwarz, 2002) and is based on judges asking themselves, "How do I feel about it"? Schwarz (1990) suggests that judges, "may mistake feelings due to a pre-existing state as a reaction to the target" (p.529). Within this AIM, this account explains quick, open decisions but Forgas (1995) argues that it struggles to explain affect infusion in more careful, considered judgments (this is obviously an issue of contention; see Clore et al., 2001; Clore & Tamir, 2002 for an alternative view).

Forgas (1995) argues that the majority of affect effects on judgments are best explained by affect priming (high effort, open). This is based on an associative network model of cognition in which emotion "nodes" are primed by the affective context. Access to emotion-relevant memories and sensations is facilitated, affecting

"what is perceived, learned and recalled and how stimulus information is interpreted" (Forgas, 1995, p.44).

Strengths of the AIM

The model was chosen for review for a number of reasons. Firstly, as an integrative approach it looks to account for the majority of findings in the field of social judgment and mood congruency, more so than other prominent component theories, such as affect-as-information (Schwarz, 2002), or affect-as-input (Martin, 2001). It is possible to generate hypotheses from its predictions and integrate new directions in research, such as the role of personality variables as mediators of mood congruency, without losing applicability or validity. Indeed, Roesch (1999) said of the model, "Numerous other theories and models… have been developed, but are, in general, subsumed by the AIM" (p.392).

In addition, while it is put forward as a model of affective influences on social judgment, it can also account for mood congruency and mood dependency effects in other fields, particularly memory (Macaulay & Eich, 2002). The integration and update of the associative network theory (Bower, 1981), now referred to as affect priming, allows predictions about the parameters within which these effects will be present.

Forgas (2002a) draws on a broad literature, not only Bower's work but also the Affect-As-Information hypothesis (Clore et al., 2001), ideas about assimilation and accommodation in different mood states (Fiedler, 2001) and mood repair strategies (Erber & Erber, 2001). Forgas (2002b) argues against "theoretical imperialism" (p.91). Many commentators praise this multi-process approach (Bless, 2002; Detweiler-Bedell & Salovey, 2002; Fiedler, 2002; Macaulay & Eich, 2002).

Detweiler-Bedell and Salovey (2002) assert, “progress depends on the emergence of second-generation theories that can link and integrate broad areas of empirical research” (p.91). As such, the AIM is a testable, empirically supported and integrative model that has helped stimulate discussion and research in the area of cognition and emotion interactions.

The AIM: Debate

It is also true that the AIM has stimulated plenty of debate. The heuristic processing strategy in the model comes from the affect-as-information approach, but its proponents are divided regarding the specifics of it. There are those who advocate the original approach (Schwarz, 2002), whereas Martin (2001) and Clore et al. (2001) take slightly differing approaches in order to explain mood congruency findings unaccounted for by the original account. Schwarz’s account does not predict the parameters of mood congruency, such as when mood incongruency is likely to occur, nor can it explain mood congruent recall or associations. Proponents of the three accounts also commented on the AIM (Clore & Tamir, 2002; Martin, Shelton, & Shrira, 2002; Schwarz, 2002).

Martin (2001) puts forward a mood-as-input explanation of mood congruency, arguing that, “Mood in context, but not mood in isolation, makes an effective retrieval cue” (p.142). This is in direct opposition to the affect priming idea (Bower & Forgas, 2000), that the simple experience of a mood prompts activation of associative links. Martin argues that, “what is important in determining one’s evaluation is not the valence of the mood per se but the degree of match between that valence and the valence one could expect to experience if that target had fulfilled its role” (p.143). In his opinion, mood effects on responses are explicable through his

account.

Martin et al. (2002) argued that the AIM does not introduce enough new theories and that it complicates issues rather than providing parsimony with those existing theories. They are unconvinced by Forgas's use of decision latencies and recall to illustrate processing strategy, as was Isen (2002). They also argue that it is too self-restrictive, attributing "all effects other than mood congruent evaluation to processes outside the scope of the AIM" (p.75). A lack of clarity as to the elements that limit or prevent mood congruency, particularly motivated processing, is a common criticism wagered by commentators (Schwarz, 2002; Isen, 2002; Manstead & van der Pligt, 2002), and one that even Forgas (2002b) partially acknowledges.

Clore & Tamir (2002) respond to the AIM with their updated mood-as-embodied-information account of mood-congruency. They explain this clearly, however their explanation of how mood might infuse more substantial or complex judgments is difficult to distinguish from affect priming. After clearly disagreeing with the existence of emotion nodes, they write about "representation[s] of an emotional state" (p. 37). They go on to clarify that *concepts* of moods and moods themselves are not necessarily equitable in their opinion. That said, the distinction between "on-line affective experience" and "affective concepts and memories" (p.43) is not made clear. How does the priming of affective concepts differ from the priming of affective associations and from the experience of affect? Forgas (2002b) himself makes this point: "there may be little or no empirically discernable difference between the predictions of the affect-priming model and the revised and extended affect-as-information model as advanced by Clore and Tamir in their comments" (p.96).

That said, Clore et al.'s (2001) assertion of the absence of emotion nodes in the brain is cogent. They cite evidence (such as Lowenstein, 1996, as cited in Clore et al., 2001) that humans cannot store emotions, saying, "people underestimate the impact of emotional experience because they have no way of storing the experience so that it can be retrieved later" (p.36). They argue that concepts and facts about emotions are stored and may be used to re-create emotions about memories when retrieved later. This idea is intriguing because the richness and complexity of human emotion being reduced to "six (plus or minus two)… emotion nodes" (Bower & Forgas, 2001, p.103) seems reductionist. More complex accounts of levels of activation on a number of continua are more convincing (e.g. Lerner & Keltner, 2000). Given this small number of nodes, the number of memories linked with each emotion must be huge. This observation is related to the "fan effect" criticism, which points out the potential implication of affect priming that all valenced material is made more accessible by mood state, so the spreading activation will dissipate priming effects. In response, Forgas (1995) asserts that, "Affect should not prime all similarly valenced cognitions indiscriminately but should function as an additional source of selective activation among constructs already primed" (p.45). This is not an explicit assumption of the associative network model (Bower & Forgas, 2001), however.

Another important issue is the debate regarding how affect influences processing strategy choice (Fiedler, 2002; Isen, 2002; Macaulay & Eich, 2002). Evidence is inconsistent; some accounts show more heuristic, surface-level processing in happy subjects and more constructive, thorough processing in sad

subjects (also viewed as assimilation v. accommodation respectively; Fiedler, 2001). However, there is also evidence that "positive affect enhances problem-solving and the ability to take multiple factors into account simultaneously and deal realistically with whatever is necessary in the situation" (Isen, 2002, p.58). There may be aspects of this debate that can be attributed to differing uses of terms and misunderstandings (as both Forgas, 2002b and Isen admit), but there remain conflicting findings, as Macaulay and Eich point out. Indeed, Forgas (2002b) acknowledges, "[an] unresolved issue concerns the processing consequences of negative affect" (p.100).

Clinical Implications

The study of mood effects on judgment and processing has concentrated on the effects of positive and negative moods. This has naturally lead to some investigations of decision-making and risk-taking in clinical populations, particularly those diagnosed with mood disorders. The model does not explicitly extend its remit to these populations, although some of the studies in this review begin to do so. It is crucial to consider how processing might differ between the 'normal' and the clinical population so that knowledge about the differences and similarities might lead to new interventions that help prevent relapse.

The AIM is useful at considering affect infusion in decision-making and memory processes, so a next step of integrating knowledge about clinical populations is natural. In fact, the affect priming hypothesis has been tested using clinical samples in the past (Eich, Macaulay & Lam, 1997). Macaulay and Eich (2002) clearly consider the AIM applicable to clinical samples, discussing evidence from clinical samples in the context of the model.

In all, it is evident that the AIM is an empirically validated and testable model that has been extensively commented upon. However, it is noticeable that reviews in this area are normally non-systematic (e.g. Aspinwall, 1998; Buchanan, 2007; Forgas & George, 2001). This review uses a systematic system of selection and assessment of the evidence that lends a more genuine perspective of the usefulness and applicability of the model. This avoids the omitting of important and relevant data and allows a unique consideration of the current view of the literature considering this important and richly contested research area.

Definition of Terms

In this review, as in Bower & Forgas (2000), the words affect, emotion and mood will be used interchangeably. Clore et al. (2001) provided clear distinctions between relevant terms. Within their definitions, emotions and moods are temporary states, but an emotion has a salient object whereas a mood is not concretely related to an object or event. They characterised enduring dispositions as attitudes or temperament, again drawing the distinction between the presence or absence of an object for attitudes and temperament respectively. Affect is the umbrella term encompassing all these words. This is where this review differs from their definitions: affect will be used only as a synonym for an emotion or mood. The AIM looks to account for the effects of mood as defined above, but Forgas (2002b) also feels that it can account for the effects of emotions - more intense, transient states.

Method

A systematic literature review was conducted. All published studies since 2000 evaluating the AIM were eligible for inclusion. Computerised databases searched were MEDLINE (1950 – present), CINAHL with full text (1995 – 2008), PsychINFO (1995 – 2008) and Web of Science (all years). The search strategy varied for each database (see Appendix 3 for full details of searches), but in general involved combining the terms *affect* AND *infusion* AND *model* in any field, sometimes including the name *forgas* in any field. Online abstracts were scanned for potentially relevant articles. Full text was then searched to confirm relevance. A hand search of all the references of included journal articles yielded further relevant papers, and suitable articles reported on Prof. Forgas's website were included. Prof. Joseph Forgas was contacted directly for advice regarding any additional articles.

Study Inclusion Criteria:

1. Experimental paper in English
2. Published since 2000
3. Paper evaluated AIM. Criteria were, (a) whether the paper made reference to the AIM in forming hypotheses or discussing results and (b) whether the results had implications for specific AIM-related predictions

Study Exclusion Criteria:

1. Paper is a book chapter or review
2. Published before 2000
3. Entirely unrelated to AIM
4. Mention of AIM but lack of fulfilment above criteria

As elucidated above, mention of the AIM in passing as a theory of mood-congruent

judgment was not sufficient. Figure 2 shows the article selection process for the review.

Any results retrieved that were evidently unrelated or not in English are excluded from the figure (N=64). Duplicate references are also not included. This left 133 references, of which a further 62 were excluded (Appendix 1). Rationale for exclusion of certain groups of articles is given below.

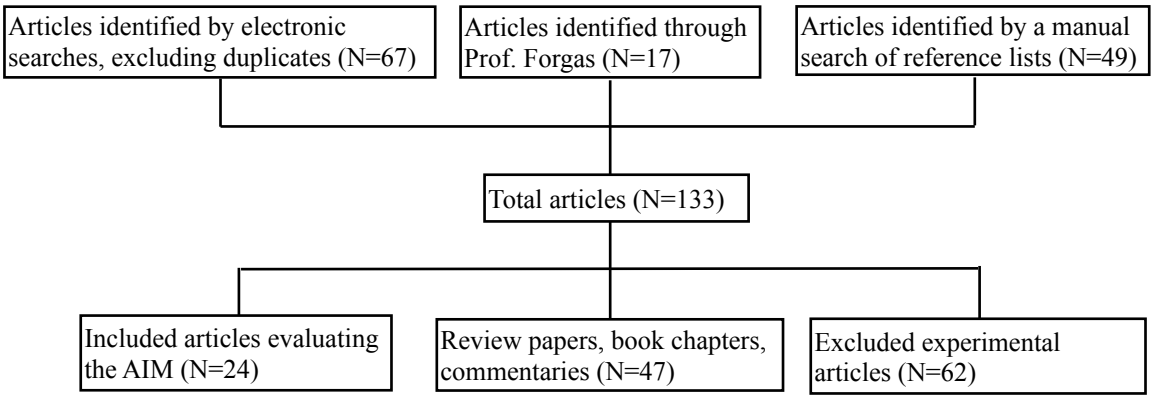

Figure 2. Flowchart of article selection process.

Four articles that studied affective influences in children or older people were excluded, as these influences on judgment and behaviour differ at different ages (Chou, Lee, & Ho, 2007; Gobbo & Raccanello, 2007; Hlebec & Ferligoj, 2001; Terwogt, 2002). For example, Chou et al.'s paper may be seen as an experimental test of socioemotional selectivity theory (Cartensen, 1993, as cited by Chou et al., 2007). Younger people show a negative bias in judgment, whereas older people show a positive bias. These differences muddy the waters in terms of evaluating the AIM, therefore only experiments involving adults were included.

Five articles investigating the roles of specific emotions were excluded (DeSteno, Petty, Wegener, & Rucker, 2000; DeSteno, Petty, Rucker, Wegener, & Braverman, 2004; Lerner & Keltner, 2000; Lerner & Keltner, 2001; Tiedens &

Linton, 2001). This was because they do not specifically evaluate the AIM, but rather the valence-based approach as a whole. However, their findings are important in advancing the field, so will be considered in the discussion.

Five further excluded articles (Alter & Forgas, 2007; Bohner & Weinerth, 2001; Damen, van Knippenberg, & van Knippenberg, 2008; Rafienia, Azadfallah, Fathi-Ashtiani, & Rasoulzadeh-Tabatabaiei, 2008; Wyland & Forgas, 2007) were problematic to make a decision on. Alter & Forgas is about self-handicapping in positive affect, only referring to the AIM as a generic contribution to the findings of the study, without considering it explicitly at any point. Bohner and Weinerth's paper investigates whether affect congruency might be affected by likelihood of questioning legitimacy, saying that their results are "generally consistent with various theoretical models… such as Forgas's (1995) affect infusion model" (Bohner & Weinerth, 2001, p.1426). Damen et al. is about affective match and leadership, citing Forgas (1995) when referring to mood congruency as a construct, alongside other researchers. Rafienia et al. focus on the mediating effect of personality variables in the processing of emotional information, again only referring to the AIM as a mechanism (amongst others) by which mood congruent processing may be explained. Wyland and Forgas concerns the effect of mood on the ability to suppress thoughts, referencing the AIM only in relation to how affect influences cognitive and behavioural strategies.

Forty-seven references were not primary experimental sources: book chapters, books, commentaries, reviews or theoretical papers. Twenty-four articles, published between 2000 and 2008, met inclusion criteria. The included papers are

from a variety of disciplines and as such the experimental designs show a lot of heterogeneity. A qualitative consideration of the articles was thus conducted.

Data Extraction

A proforma was created to extract data and assess study quality, based on Downs and Black (1998) (Appendix 2). The checklist gathered information about *N*, experimental bias, validity and reliability of outcome measures, statistical and mood induction procedures, aspect of the AIM tested and outcome. The checklist provided a numerical score for each paper, but it was not useful in this instance due to the heterogeneity of the articles.

Results

The 24 papers included in the review were divided into broad topics for comparison. These are (a) judgments and personality, (b) level of experience, (c) communication, (d) risk perception and decision-making, (e) affect regulation and judgments over time, and (f) self/other focus in judgments. An overview of the characteristics of each paper may be seen in Table 1. Three experiments appear twice amongst the retrieved papers: Ciarrochi & Forgas (2000) and Forgas & Ciarrochi (2001), Forgas & Ciarrochi (2002) and Forgas, von Hippel, & Laham (2004), and Forgas (2007) and Forgas, East, & Chan (2007). In the table and throughout the review, they will be considered together.

Mood Manipulations

As can be seen from Table 1, 16 papers used a mood induction. Multiple experiment papers often varied the inductions over the course of the research. The most used method was asking participants to recall and ruminate about emotional autobiographical memories, a procedure similar to the Velten task (Velten, 1968). Eight studies used this procedure (Adaval, 2001; Ciarrochi & Forgas, 2000; Detweiler-Bedell, Detweiler-Bedell, & Salovey, 2006; Forgas & Ciarrochi, 2002; Forgas, Laham, & Vargas, 2005; Forgas & Locke, 2005; Forgas & Tehani, 2005; Forgas et al., 2007). Six studies used film clips to induce mood (Adaval, 2001; Forgas & Cromer, 2004; Forgas et al., 2007; Hills, Hill, Mamone, & Dickerson, 2001; Yuen & Lee, 2003; Zarinpoush, Cooper, & Moylan, 2000). Three studies used feedback or a task: spontaneous feedback, false feedback from a task, or an impossible task (Forgas, Dunn, & Granland, 2008; Forgas et al., 2007; Hockey,

Maule, Clough, & Bdzola, 2000). Of the remaining studies using a mood manipulation, one gave a small gift (Locher, Frens, & Overbeeke, 2008), and Nabi (2003) primed emotions by asking questions about issues that concentrated on emotional words, such as, for anger: angry, irritated, tense, annoyed and frustrated.

All studies made efforts to limit demand characteristics in the mood induction paradigm. Locher et al. (2008) refrained from measuring the effectiveness of their mood induction in order to prevent demand characteristics, and Hills et al. (2001) informed participants to report their mood, but not to worry if it changed or not. The remainder of studies involving a mood induction introduced it as a separate experiment carried out with the other for convenience.

Judgments and Personality

There are seven articles in this category (Adaval, 2001; Chang, 2008; Ciarrochi & Forgas, 2000; Forgas & Ciarrochi, 2001; Forgas et al., 2005; Huelsman, Munz, & Furr, 2003; Nabi, 2003).

Two (Adaval, 2001; Chang, 2008) looked at how the positive or negative framing of products or the valence of attributes in advertisements describing them affected preference for the product or the weighting of the information, and how this interacted with current affect and goals. Adaval found that participants weighted information congruent with their mood than that incongruent with their mood. Adaval also found that participants better remembered attributes that were consistent with their current mood (e.g. favourable attributes for happy participants). Mood congruent effects were reversed when participants were asked to report their mood before completing the tasks, drawing attention to the source of their bias. Both Adaval and Chang found a moderating effect of motive or goals on the influence of

affect, such that hedonic motives (e.g. motives to have fun or to improve one's life) were more subject to affect infusion than functional, utilitarian motives.

Nabi (2003) investigated whether specific emotions, fear and anger, may serve as frames that affect "information accessibility, desired information seeking, and policy preference"(Nabi, 2003, p.224). He expected that the level of familiarity with the topic would mediate affect infusion. The results offered some support for this. For a familiar topic (drink driving), those primed with anger made more individual and blaming attributions and sought retributive solutions (in a forced choice situation) compared with those primed with fear, who were more likely to attribute problems to society and seek protection-related solutions. For an unfamiliar issue (gun violence), no affect infusion was observed for any outcomes.

In Nabi's (2003) study, level of familiarity mediated affect infusion in the opposite direction to that predicted by the AIM. Within the model, familiar judgments are presumed to trigger direct access processing without any recourse to emotional state. However, the results may be seen as consistent with the AIM viewed this way: familiar but complex topics that have been debated before are likely to incur substantive processing, whereas unfamiliar topics do not have pre-existing schemata that may be primed by mood, participants rely on unfamiliar and un-debated opinions that they may have read or heard, thereby using direct access processing.

Huelsman et al. (2003) looked at the mediating role of positive and negative affect in the relationship between job characteristics and job satisfaction. That is, those who are in a job with certain desirable characteristics, such as autonomy, are more satisfied with their job; they hypothesised that this was mediated by positive

affect, and similarly that dissatisfaction was mediated by negative affect. They measured trait and state affect as potential mediators, predicting that state affect would mediate the relationship more strongly. Thirdly, they included negatively and positively phrased questions in the Job Diagnostic Survey (JDS; a survey of job characteristics), hypothesising that where affect and the valence of questions on the JDS matched, the mediating role of affect would be greater.

The first hypothesis was supported, and the second partially so. However, most relevant here is their discussion of the results of their third hypothesis, the data for which showed an interesting pattern. Firstly, negative affect showed no mediating relationship between negatively worded items on the JDS and job satisfaction. Positive affect mediated the relationship between job characteristics and job satisfaction so strongly that there was little difference between the two phrasings of the survey.

Huelsman et al. (2003) examined how the AIM might explain their weak findings for the effect of positively or negatively worded questionnaire items. They speculated that positively worded items were answered using direct access processing of previously stored responses, thereby preventing state affect (e.g. mood) affecting their responses (preventing affect infusion). By contrast, negatively worded items recruited more substantive processing (heuristic), causing infusion of state affect into judgments. This predicts that depending on the wording of the question, state affect will or will not affect the judgment. They cite observations of a number of authors that the negatively worded items appear harder to respond to than positively worded items. These are interesting predictions and although quite speculative, may be directly tested.

Ciarrochi and Forgas (2000) and Forgas and Ciarrochi (2001) found that those in a good mood were prepared to pay more for actual or potential possessions than those in a sad mood. This effect was mediated by participants' scores on the Openness to Feelings scale (OF: Costa & McCrae, 1985, as cited by Forgas & Ciarrochi, 2001). Those who scored highly (who were open to their feelings) showed the most affect infusion in value judgments. Conversely, lower scorers (who actively avoided their feelings) showed a mood incongruent effect, valuing their possessions more highly when in a sad mood and vice versa. These findings are highly consistent with the AIM, showing affect infusion for some participants but also evidence that a motivated processing strategy may be employed depending on personality variables.

Forgas et al. (2005) investigated the effect of affect on the integration of misleading information into memory and how this is mediated by personality variables. Leading questions containing inaccurate information affected the accuracy of happy participants more than sad participants. Forgas et al. took this as support for the finding that sad participants show more systematic processing and base judgments less on information on the environment. This was mediated by levels of self-monitoring and social desirability. Those scoring highly on these constructs were able to counter the misleading effects of mood and actually showed a mood incongruent trend (that is, they were somewhat more accurate when happy than sad). This suggested motivated processing.

Risk Perception and Decision-Making

Four studies fall under this category (Hills et al., 2001; Hockey et al., 2000; Thompson & Dennison, 2004; Yuen & Lee, 2003). Thompson and Dennison will be discussed first, due to a similar topic to the previously discussed study.

Thompson and Dennison (2004) examined how written "graphic evidence of violence" (GEV; p.323) might affect juror decision-making. They manipulated the presence or absence of GEV in a transcript and the nature of juror instructions (whether or not the instructions included reference to GEV). They also measured juror bias and juror emotional state (stress, anguish, disturbance, shock) across conditions. They found that GEV did not affect juror decisions, neither did the nature of the instructions given. They found an effect of juror bias in that defence-biased jurors needed more evidence to convict, especially in the presence of GEV. They found these decisions more stressful than their prosecution-biased counterparts.

GEV did not induce a negative mood in jurors, and those who did show an increase in stress (defence-biased jurors) showed a mood-incongruent judgment. It might have been expected that those who were more stressed would have been keener to convict, but the defence-biased jurors (who were stressed) were less likely to convict. The authors concluded that this is inconsistent with the AIM, but it may have shown that those who were likely to be more lenient (defence-biased) used motivated processing in the presence of GEV to preserve their bias. This relates to Ciarrochi and Forgas (1999) in that those high in anxiety were less discriminating against those in a racial outgroup in a negative mood, interpreted as motivated processing.

Hockey et al. (2000) and Yuen and Lee (2003) both considered the effects of mood on risk taking, albeit using different approaches. Yuen and Lee used a positive and negative mood induction and used responses to scenarios to judge how participants acted in different moods. Those who watched negative film clips were significantly more conservative than those who watched positive film clips.

By contrast, Hockey et al. (2000) initially used averaged ratings of mood over time to look at the role of anxiety, depression and fatigue in relation to risk-taking measured in the same way as Yuen and Lee (2003). They found no effect of anxiety or depression on risk-taking behaviour but an effect of fatigue, such that fatigue significantly increased risk-taking behaviour. In their third reported experiment, they used an impossible task mood induction to tire management trainees and then measured their risk-taking. Fatigue appeared a robust mediator of risk-taking behaviour.

These articles have differing implications for the AIM. Yuen and Lee's (2003) results support the idea that systematic processing carried out by sad participants and priming of feared negative outcomes leads to more conservative behaviour. On the other hand, depression and anxiety (components of negative mood) showed no such effects for Hockey et al. (2000). They concluded that fatigue lowered "engagement in active information processing" (p.850). Their null results for anxiety and depression may be explained by their use of natural, subtle mood fluctuations, but the presence of an effect for fatigue on risk-taking is not one easily explained by the AIM.

Hills et al. (2001) discussed the effect of mood on gambling persistence. Theories of gambling persistence have drawn links with negative mood, but in this

study they propose that regular gamblers are motivated to continue gambling for two reasons: “achieving a positive mood state (mood repair) or maintaining a positive mood state (mood maintenance)” (p.1631). They therefore predicted that regular gamblers would not show mood effects on gambling persistence.

They found that non-regular gamblers’ persistence was affected by their mood state; those in a positive mood persisted longer than those in a negative mood. As predicted, regular gamblers were not so affected. They interpret this as showing clear support for the AIM in a context relating to ‘problem’ behaviours.

Level of Experience

Forgas et al. (2008), Forgas and Tehani (2005) and Locher et al. (2008) all investigated the mediating effect of experience on affect infusing processes, somewhat similarly to Hills et al. (2001). They are grouped for this reason, although the experimental paradigms are different. Forgas et al. and Forgas and Tehani found mood affected performance feedback and customer service respectively. Sad-induced participants were less polite and more negative when giving feedback (Forgas & Tehani), and were less helpful to customers (Forgas et al.). Less experienced employees showed more affect infusion than their more experienced counterparts.

Locher et al.’s (2008) experiment was laboratory based, and showed a different pattern of results about the mediating role of level of experience in affect infusion. Design students and design novices, half of whom had received candy at the start of the experiment, rated digital camera designs. They observed an overall effect of mood congruence (equal affect infusion for each group). Their analyses also indicated that design students engaged in more substantive processing than their inexperienced counterparts. Design students spent more time looking at the cameras,

made more comments overall, and showed no change in the pattern of positive, negative or neutral comments in either condition, while novices showed a clear bias for few, positive comments when in a positive mood.

Self/Other Focus in Judgments

Two studies looked at how the focus of a judgment might affect the degree of affect infusion (Detweiler-Bedell et al., 2006; Zarinpoush et al., 2000). Detweiler-Bedell et al. (2006) studied how participants judged their success when in happy or sad moods as moderated by whether they were asked to judge their own performance as compared to others, or to judge others' performance first. Focusing on others' performance before their own decreased the influence of mood on participants' self-judgments. Detweiler-Bedell et al. (2006) write, "Other-focused decision frames appear to decrease subjectivity… as information processing becomes less open and constructive" (p.212), clearly in line with AIM predictions.

Zarinpoush et al. (2000) looked at how moral judgments were affected by mood. They found that those in a happy mood in general made more simplistic moral decisions based on weaker arguments than those in neutral or negative moods when the task was other-focused. When the task was self-focused, this effect disappeared for happy participants, but those in negative moods showed significantly more principled decisions than happy or neutral participants. Furthermore, when the moral decisions were more disturbing or difficult, mood effects disappeared entirely. This will be considered further in the discussion.

Affect regulation and judgments over time

Three articles (Forgas & Ciarrochi, 2002; Forgas et al., 2004; Homburg, Koschate, & Hoyer, 2006) investigated the effect of affect on judgments over time. Homburg et al. (2006) investigated how customer satisfaction might vary. Specifically, they predicted that satisfaction with a product could be predicted by cognitive (knowledge and experience of the product) and affective ("how-do-I-feel-about-it") factors. They presented students with a CD-ROM product designed as a study aide, manipulating its ease of use and reliability across participants over three trial periods with the product.

Firstly, they hypothesised that the predictive ability of the affective and cognitive factors would increase over time as opinions about the product became more certain and stable. Secondly, they predicted (using the AIM) that the role of affective and cognitive factors would vary over time, affective factors decreasing and cognitive factors increasing as time passed. They argued that newly forming opinions are likely to be based on a heuristic reference to current affect, and as information and knowledge accumulates, the opinion will be familiar and incorporate direct access processing, thereby resisting affect infusion. The third hypothesis suggested that the pattern of affective and cognitive influences on customer satisfaction as predicted above would be more pronounced when students experienced a consistently good or bad product rather than an inconsistently performing product. The results supported their hypotheses, and thereby the predictions of the AIM.

Forgas and Ciarrochi (2002) and Forgas et al. (2004) looked into mood congruent responses over time. In three experiments, those in a happy mood initially

thought of more positive self and other descriptions and completed more positive trait words. The opposite was observed for sad participants. However, over the course of their responses participants in both groups were observed to gradually reverse the pattern of their responses not just to neutral, but to the opposite valence. It could be argued that this might be explained by a natural decay in induced mood leading to more 'normal' responses. However, Forgas et al. (2004) understand this as indicating motivated processing to repair mood rather than mood decay, as decay would not be predicted to lead to mood incongruency but rather the absence of any link between mood and responses. They integrated it into a mood management hypothesis which describes the use of substantive or motivated processing in an homeostatic feedback loop controlling and stabilising mood over time, and dictating processing choice.

Communication

Five articles (Forgas & Cromer, 2004; Forgas & Locke, 2005; Forgas et al., 2007; Forgas, 2007; Killgore & Cupp, 2002) considered the impact of affect on social communication and perception, in some ways the most direct application of the AIM.

Killgore & Cupp (2002) selected participants based on very high or very low scores on the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock & Erbaugh, 1961, as cited in Killgore & Cupp, 2002) and compared their ratings of the intensity of happy faces. Those in a sad mood were expected to give lower intensity ratings of the faces. They were particularly interested in the influence of sex on the ratings, as they predicted that sex would also have a role in affective processing choices. In general, men rated the emotional intensity of faces as less, particularly

amongst low BDI scoring men. This was interpreted as evidence of direct access or motivated processing. High scoring men rated the intensity higher than low dysphoria men, suggesting motivated processing in the service of mood repair. High scoring women rated intensity as lower, indicating substantive processing, and low scoring women rated intensity as higher, indicating heuristic processing.

Forgas & Locke (2005) investigated responses and causal attributions in teachers considering real-life work conflict situations. Those in positive moods were positive, lenient and optimistic, attributing positive outcomes to themselves and negative outcomes to others. Those in negative moods attributed negative outcomes to themselves and positive outcomes to others and were more critical. The authors interpret the results as supporting the AIM in showing that affect influenced, "the kind of details they [the participants] paid attention to, recalled the kind of interpretations they constructed, and ultimately, the kind of causal attributions they made" (Forgas & Locke, 2005, p.1079).

Forgas & Cromer (2004) also looked at how mood influenced strategies to deal with conflict. Conflict scenarios were given to happy or sad induced participants. Those in a negative mood were more evasive, less elaborate and in high conflict situations, more equivocal. Happy participants were more direct and equivocated less. Forgas and Cromer interpret this as indicative of substantive processing and priming of negative outcomes amongst sad participants, and heuristic processing and priming of positive outcomes amongst happy participants.

Forgas's (2007) and Forgas et al.'s (2007) experiments tie in with the previous study. In constructing persuasive messages, participants in a negative mood were more persuasive, concrete and specific arguments. This is argued to come from

their substantive approach to processing, where happy participants produced weaker arguments based on highly accessible, less thought-out information, using heuristic processing. However, when a reward was offered, the effect of mood on persuasiveness disappeared, so that messages from positive, negative and neutral participants were judged as similarly persuasive. This is interpreted as motivated processing subverting affect infusion.

Authors	N	Participant source	Brief outline of study	Mood induction method	Significant findings (at least $p < .05$, unless otherwise indicated)
Adaval (2001)	Exp 1: 160 Exp 2: 325 Exp 3: 40 Exp 4: 66	Students	Information about products which is congruent with current mood will be given more value. This effect is limited to hedonic goals rather than utilitarian goals.	Film clips Autobiographical memory task	Found mood congruent judgments and memory of product information. Hedonic (feelings-based) goals accentuated the mood congruent effect, and utilitarian goals limited it.
Chang (2008)	Exp 1: 160 Exp 2: 160	Students	Affect in advertisements may be viewed as a mild mood induction that affects believability and likeability of advert, opinion of brand. Mediated by type of product attribute featured: psychological or functional.	None	Positive advertising stimulated congruent feelings that influence consumer judgments as predicted. Advertising featuring functional attributes did not show this effect.
Ciarrochi & Forgas (2000) Forgas & Ciarrochi (2001)	Exp 1: 48 Exp 2: 144	Students	Affect might influence value given to actual or desired possessions. This effect might be moderated by openness to feelings (OF).	Autobiographical memory task	Students showed an overall mood congruent effect: those in good mood valued actual or potential possessions as worth more than those in a negative mood. Mood congruency was only observed for those high on OF. Mood in-congruency was observed for low scorers in the trait.

Detweiler-Bedell, Detweiler-Bedell & Salovey (2006)	Exp 1: 60 Exp 2: 72	Students	Mood congruency in judgments of self success may be influenced by whether the participant is asked to judge him or her self or others first.	Autobiographical memory task	Those who judged others' success first showed no mood congruency in judgments of their success.
Forgas (2007) Forgas, East & Chan (2007)	Exp 1: 59 Exp 2: 125 Exp 3: 256 Exp 4: 128	Students	Looked at how mood affected quality and effectiveness of persuasive interpersonal messages.	Film clips Autobiographical memory task False feedback	Participants in a negative mood produced more persuasive messages when advocating both popular and unpopular opinions (Exps 1 and 2). This finding was replicated when naïve subjects were presented with arguments from happy and sad participants (Exp 3). In a computer interaction task, participants produced the most concrete and specific arguments as well as the most persuasive, only in the absence of reward (Exp 4).

Forgas & Ciarrochi (2002) Forgas, von Hippel & Laham (2004)	Exp 1: 60 Exp 2: 55 Exp 3: 48	Students	Investigated how mood congruent responses change over time to produce mood incongruent responses. Put forward a theory of mood regulation (in a evolutionary context).	Autobiographical memory task	Those in happy mood initially produced more positive responses, then progressively became less positive. Those in negative mood showed this effect even more markedly.
Forgas & Cromer (2004)	64	Students	Examined how affect influences response to conflict situations. Those in a negative mood expected to be more cautious, equivocal and evasive, being more defensive. High conflict situations were expected to exaggerate the effect.	Film clips	Those in a negative mood were significantly more evasive and elaborated less in communicating. This effect was replicated and equivocation was also significantly higher in a high conflict situation.
Forgas, Dunn & Granland (2008)	61	Sales assistants	Customer service is likely to be negatively affected when those serving are in a bad mood. More experienced employees may be less	Feedback	New employees who had been insulted or praised showed poorer or better customer service respectively. This was not evident amongst experienced staff.

			affected by this.		
Forgas, Laham & Vargas (2005)	Exp 1: 96 Exp 2: 144 Exp 3: 80	Students	Investigated how transient mood might affect eyewitness accuracy. Processing differences between positive and negative mood suggest that those in a negative mood will be more systematic and thus less likely to integrate misleading information into their testimony. Also looked at the role of personality variables such as self-monitoring and social desirability.	Autobiographical memory task	In general, positive participants integrated more inaccurate information from leading questions than did negative participants, who integrated the least inaccurate information. This was not the case for open questions. High self-monitors were effective at suppressing the effect of their feelings, creating a non-significant mood incongruent effect (p<.06). A similar pattern was observed for those high in social desirability.
Forgas & Locke (2005)	102	Teachers	Looked at how mood might affect causal attributions for realistic events. Expected happy subjects to be more positive, lenient, and optimistic in attributions than sad participants.	Autobiographical memory task	Hypotheses supported. Negative participants were more critical, made more external attributions of good outcomes and more internal attributions of negative outcomes. The opposite was observed for happy participants.

Forgas & Tehani (2005)	40	Employees	Mood is likely to affect performance feedback in a work situation, particularly among those unused to giving feedback.	Autobiographical memory task	Novices showed more changes in their feedback due to mood than their expert counterparts. They were more negative and less polite, whereas experts were more polite.
Hills, Hill, Mamone & Dickerson (2001)	120	Students	The effect of mood on gambling persistence was investigated. Non-regular gamblers were expected to show a mood congruent bias in playing, positive participants persisting longer than those in a negative mood. Regular gamblers were expected to show motivated processing, unaffected by mood.	Film clips	Hypotheses supported, suggesting that mild dysphoria does not prompt regular gamblers to persist or to inhibit gambling.
Hockey, Maule, Clough & Bdzola (2000)	Exp 1: 34 Exp 2: 58 Exp 3: 55	Students Students Management trainees	Looked at how state and trait anxiety, depression and fatigue affected risk taking, as measured by decisions made in 13 scenarios.	None None Impossible tasks	Anxiety and depression did not appear to cause changes in level of risk taking. Fatigue was a relatively stable predictor of risk taking – the more fatigued the more risky. This was mediated

					by the familiarity and importance of the task. High familiarity accentuated and high importance dampened the effect of fatigue on risk taking.
Homburg, Koschate & Hoyer (2006)	157	Students	There are cognitive and affective influences on judgments of products. This study looked at how these play differing roles over time.	None	Over time, affective influences on judgments become less (less affect infusion) and cognitive influences become more (knowledge and experience of the product).
Huelsman, Munz & Furr (2003)	612	Employees	Looked at how positive and negative affect mediates the relationship between job characteristics and job satisfaction. Predicted that state affect has a stronger role than trait affect. Also predicted stronger relationship when item wording matches affect in valence.	None	Found that positive affect has a very strong mediating role for positively and negatively worded items. Trait positive affect appears to be a strong mediator of the relationship, whereas trait negative affect is not. Matching between item wording and affect only had an effect for negative affect.
Killgore & Cupp (2002)	104	Students	Selected participants low and high on BDI and asked them to rate facial expressions for intensity. Low BDI	None	Hypotheses mostly supported. Men showed low affect infusion and women showed high affect infusion, in general. Those low on BDI scores

			scoring men predicted to show little affect infusion. High scoring men predicted to show mood incongruency through motivated processing. Women expected to show affect infusion, low scoring women through heuristic processing, high scorers through substantive processing.		showed sex differences: men reported lower emotional intensity than women. There was no difference in perceived emotional intensity amongst highly dysphoric men and women. These sex differences disappeared when less extreme scores were used.
Locher, Frens & Overbeeke (2008)	40	Students	Affect is likely to infuse judgments of designs, but the pattern of responses will be mediated by design experience.	Candy	Novices showed affect infusion, by judging designs as more positive when in a good mood. Experts also showed this, but looked at the designs for longer and showed no change in the proportions of positive, negative or neutral comments.
Nabi (2003)	166	Students	Explored the ability of framing to induce an affect-perspective and how	Biased questionnaire	For a familiar topic, priming of anger led to more individual and blaming attributions and more

			this would affect decisions about information accessibility, desired information seeking and policy preference for familiar and unfamiliar topics. Expected that familiar topics would lead to affect infusion of anger- and fear-related judgments.		punishment-related solutions. Priming of fear led to more societal attributions and protection-related solutions. For an unfamiliar topic, no affect priming was observed.
Thompson & Dennison (2004)	128	Students	Investigated the effect of violent or graphic evidence on juror bias in decision making as influenced by the nature of juror instructions. In addition, juror bias for defence or prosecution and some emotions (stressed, anguished, disturbed, shocked) were measured.	None	Verbal graphic evidence of violence (GEV) did not affect mock juror verdicts. The inclusion of graphic-specific instructions did also not affect verdicts, although the presence of GEV did cause more stress in jurors. Defence-biased jurors needed more certainty to convict in the presence of GEV. In addition, they felt more stressed when delivering verdicts.
Yuen & Lee (2003)	54	Students	Investigated the link between positive	Film clips	Found that those in a negative mood were

			and negative mood and risk taking. Predicted that participants in a positive mood would take more risks (as measured by scenarios) than those in a negative mood.		significantly more conservative in their decisions, whereas those in a positive mood did not differ from the neutral mood condition.
Zarinpoush, Cooper & Moylan (2000)	Exp 1: 109 Exp 2: 89 Exp 3: 75	Students	Examined the effects of mood on moral reasoning. Manipulated the focus (self/other) and seriousness of tasks in order to examine differential effects.	Film clips	Found less principled moral decisions (as measured by this study) by happy participants when task not self-focused, no effect for sad participants. In a self-orientated task, sad subject more principled but no effect for happy participants. When task was morally disturbing, mood effects disappeared.

Table 1. Summary information of included articles.

Discussion

This review has considered the current state of the evidence directly testing the AIM. Of the 24 studies reviewed, three (Hockey et al., 2000; Thompson & Dennison, 2004; Zarinpoush et al., 2000) did not support the predictions of the AIM. These difficulties will be considered later. Overall it seems that the AIM is a useful and practical model. It has wide-ranging and parsimonious applications, as can be seen from the diversity of studies included.

The AIM has been applied to plethora of topics, not just social judgments but judgments of products (Adaval, 2001; Chang, 2008; Locher et al., 2008; Nabi, 2003) and legal decision-making (Forgas et al., 2005; Thompson & Dennison, 2004), amongst others. In fact, it has been treated as a model of affective influences on decision-making as a whole and mood congruent and mood dependent memory. Amidst this, Forgas (2002a) maintains it is a model of social judgment.

Researchers in diverse fields are finding it a useful structure around which to pose hypotheses and explain results. The majority of included studies supported AIM hypotheses. However, it is important to consider the strengths and weaknesses of included studies.

Strengths and Limitations of Included Studies

In general, the research reported here is of high quality. The studies included large samples of participants, careful data analysis and rigorous reporting of findings. However, the checklist highlighted certain issues and omissions, detailed below.

For example, 11 articles did not report either mean age or sex of participants or both (Adaval, 2001; Chang, 2008; Ciarrochi & Forgas, 2000; Forgas, 2007; Forgas & Ciarrochi, 2001; Forgas & Ciarrochi, 2002; Forgas & Cromer, 2004;

Forgas et al., 2007; Forgas & Tehani, 2005; Forgas et al., 2004; Killgore & Cupp, 2002). One study had only male participants (Hills et al., 2001), which limits the external validity of the findings. It was also unclear whether confounders were included in analysis for 13 of the articles (Ciarrochi & Forgas, 2000; Forgas, 2007; Forgas & Ciarrochi, 2001; Forgas & Ciarrochi, 2002; Forgas et al., 2007; Forgas et al., 2005; Forgas & Locke, 2005; Forgas & Tehani, 2005; Forgas et al., 2004; Hills et al., 2001; Hockey et al., 2000; Huelsman et al., 2003; Locher et al., 2008). Four studies explicitly mentioned controlling for either age or sex without factoring in both (Adaval, 2001; Forgas & Cromer, 2004; Forgas et al., 2008; Zarinpoush et al., 2000). Forgas et al. (2008) controlled for age rather than sex (the only one of these), an important omission given that the majority of participants in this study were female (79%). The distribution of the sexes amongst the groups and its influence on results is therefore unclear.

Eleven studies did not report whether placement into mood induction groups was random (Adaval, 2001; Ciarrochi & Forgas, 2000; Forgas, 2007; Forgas & Ciarrochi, 2001; Forgas & Ciarrochi, 2002; Forgas & Cromer, 2004; Forgas et al., 2007; Forgas et al., 2005; Forgas & Locke, 2005; Forgas et al., 2004; Locher et al., 2008). This is important considering the lack of reporting and inclusion for analysis of potential confounds. Two studies reported non-random selection for mood induction groups (Hockey et al., 2000; Yuen & Lee, 2003). Yuen & Lee divided participants to ensure equivalency of the groups on confounding variables.

Three articles did not report whether experimenter-judges of outcome measures were blind to experimental questions or participant group (Forgas & Ciarrochi, 2002; Forgas et al., 2008; Forgas et al., 2004). This is a crucial issue to report as the constructs measured in these studies are subtle social behaviours that

may easily be coloured by the judge's perspective.

Regarding statistical constructs, only two of the articles give a power calculation (Nabi, 2003; Thompson & Dennison, 2004). All but one of the articles (Zarinpoush et al., 2000) use measures created for the study but reporting of Cronbach's α is patchy. Some articles report α scores only for some constructs, and others do not report any α scores.

There is also an important observation regarding Killgore & Cupp (2002). Their method of selecting participants as extreme scorers on the BDI led to an interesting study, but they do not mention the procedure for treating high scorers. The high-scoring men (cut-off ≥14) and high-scoring women (cut-off ≥17) showed signs of moderate depression. They could have been at risk. While it is likely that the authors considered this possibility, it is not mentioned in their report.

In addition, Forgas (2007) and Forgas et al. (2007) report a group of three experiments, the final one of which used a computer interaction task to measure persuasiveness. It is an interesting foray into the use of computers as a new social medium, and that the results mirrored the other experiments' adds validity to the design. However, it is hard to believe that participants did not realise they had been interacting with a computer. They must have wondered why they were being asked to persuade this individual to take part in the odious experiment, why they couldn't talk about something else, why they couldn't take part themselves to save the effort, why the researcher couldn't speak to the person directly, or why the other individual's responses were limited. In all, it is a questionable paradigm.

In sum then, while the papers discussed have been of a high quality, some omissions in reporting negatively affected their validity.

The AIM: Criticisms and Questions

The most salient criticism of the AIM in the literature relates to conceptual dilemmas in understandings of emotion. As mentioned in the introduction, the idea of a single node connecting all associative links for an emotional state is likely to be over-simplistic. While the experience of mood-associated states appears to affect judgment, behaviour and recall, it is difficult to conceptualise an associative network system based around an abstract, general concept like "happy". More specific happy emotions like excited, jovial or content are likely to play an important and differential role in mood congruency.

Smith & Ellsworth (1985, as cited by Lerner & Keltner, 2000) conceptualise six cognitive dimensions that effectively distinguish between emotions: certainty, pleasantness, attentional activity, control, anticipated effort and responsibility. Lerner & Keltner (2000) investigated the role of anger and fear in risk perception and found differential effects for the two negative emotional states. They argued for an appraisal-tendency approach which views each specific emotion as activating "appraisal tendencies" (Lerner & Kelner, 2000, p.477) or predispositions to perceive events in a certain way "until the emotion-eliciting problem is resolved" (Lerner & Keltner, 2000, p.477).

This approach differs from the AIM in offering more complex understanding of emotional states than valence. Integrating these findings into the AIM, such as the effect of certainty on processing (Tiedens & Linton, 2001), will require dramatic amendments to the model. Forgas (1995) himself acknowledges the importance of such approaches in advancing the research field, although it is unclear whether he intends to update the AIM in the light of these findings.

Two studies measuring risk taking have been reported here (Hockey et al., 2000; Yuen & Lee, 2003). Yuen & Lee found increased risk-taking in happy participants. However, the research base is not consistent regarding this. Isen (2002) cites evidence that in situations where there is a risk of real losses, positive mood can lead individuals to be more cautious than controls. Even though they evaluated the probability of winning higher than controls, they appeared to wish to protect their mood, as an unfavourable outcome was estimated to have a greater impact on their happy state. These findings are not predicted by the AIM and need further consideration.

This leads to examination of the three studies that did not support the AIM in the review. In fact, Thompson & Dennison's (2004) finding was essentially of mood incongruent processing that can be understood as motivated processing, so will not be discussed here. As acknowledged in the results, Hockey et al.'s (2000) finding of increased risk-taking when participants were fatigued is difficult to fit into the AIM. It does fit in that fatigued participants could have used heuristic processing because they did not have capacity to use substantive processing, but two questions remain. The first is about how fatigue would inform decisions, and the second concerns what effect fatigue has on processing choice. It is likely that an understanding based on a more complex concept of fatigue than a valence-based approach would aid understanding of the finding.

Zarinpoush et al.'s (2000) asymmetrical finding is intriguing and difficult to explain using the AIM. In the first experiment, low personal relevance is likely to lessen affect infusion, although it appears that happy participants used a heuristic approach to make decisions, leading to mood effects. Where personal relevance is high, affect infusion would be expected in both groups, but it was only observed for

the sad group. There is a possibility that self-referencing induced direct access processing due to familiar tasks, although the tasks were hypothetical so are likely to have needed some thought.

Looking at the results more closely yields more insight into the pattern, suggesting that a more helpful way to examine the effect of self-relevance on moral decisions might have been to examine the differences between means in the three groups across the two experiments. Assuming that the samples are comparable, an estimate of the effect of the self-relevance on the task could be viewed by observing the change in means in the neutral mood group. Those in a neutral mood appeared less principled in the self-referential task, whereas the other two mood groups showed a rise in their use of principled moral considerations when the task was self-referential. Given that the samples used in the two experiments are different, direct comparisons cannot be made. However, this observation shows that the effect of happy or sad mood in the experiments was symmetrical, but that the neutral group showed a different pattern, which created this asymmetrical effect in the results.

Differences between the happy and sad means are not reported, but there is a non-significant trend for mood effects in the first experiment, and a significant effect of mood in the second. These findings both support the AIM in that mood has affected moral judgment as sad participants engage in more substantive processing leading to more principled decisions, and happy participants engage in shallower processing leading to less consideration of moral principles.

Finally, the AIM's intention to be integrative and un-imperialist risks it being, as Forgas (1995) comments of the affect priming model, "notoriously difficult to falsify" (p.45). Even in writing this review, seemingly inconsistent findings are easily explicable when viewed as having generated a different processing strategy to

what one might expect. It is this flexibility that prompts authors to ask for clarification as to what processing strategy applies when, as in most experimental situations, it is difficult to unequivocally prove that a particular strategy is being used over another.

However, the AIM is not impossible to falsify, as we have found, but its limitations are centred on the valence-based focus as well as this lack of clear rules for processing strategies.

Limitations of the Review and Future Directions

This review has synthesised findings from a diverse palette of studies. The systematic method has ensured inclusion based on predetermined objective criteria rather than individual bias. However, it is evident that the vast majority of included studies support the predictions of the AIM (at risk of a Type 1 error). There is a possibility that studies with findings that do not align with these predictions use alternative theories and understandings. In addition, the inclusion criteria were tight, omitting papers that might present alternative theories with empirical support simply because they did not pitch this theory against the AIM.

However, it is argued that advancement in this area needs to be achieved by just that mechanism. For example, in a given situation, what would the AIM predict and what would the affect-as-input mechanism predict (Martin, 2001)? Research of this sort is needed to prevent diverging streams of research in similar fields. That this review does not uncover studies of this kind is testament to this.

The likely reason for this lack is the scale of complexity required to distinguish between subtle mental processes. As quoted in the introduction, Forgas effectively regards the affect-as-information model of Clore et al. (2001) as empirically indistinguishable from the AIM. The call for integration remains

however, as crucial in enabling closer examination of affective influences in mental life.

This call extends to the literature relating to the influence of specific emotions. Before an integrated model including the role of the six cognitive dimensions in processing choice is possible, research is needed to clarify their role in affective state and judgments. In addition, research is needed to investigate differences between 'normal' populations and clinical populations, testing the applicability of the AIM outside the parameters of minor mood changes (such as Killgore & Cupp, 2002). In summary, whilst this is a useful model, there remain plenty of unanswered questions.

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Running Head: MOOD AND MEMORY IN BIPOLAR DISORDER

PART TWO: EMPIRICAL PAPER

A Comparison of Mood Effects on Memory Processes in Bipolar Disorder and Normal Controls: Recall, Recognition and Perception

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This paper is written in the format ready for submission to the Journal of Abnormal Psychology. Please see appendix 5 for the Guideline for Authors.

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Abstract

The differences between bipolar-diagnosed and non-clinical control participants were investigated for three memory processes: mood-dependent memory, mood-congruent memory and autobiographical memory perception. Fifty-eight participants generated 6 autobiographical memories after receiving a positive mood induction and rated them in a number of ways. They also saw 4 inkblots. After receiving the same or a contrasting mood induction, participants recalled and re-rated the autobiographical memories and attempted to recognise the inkblots. There were significant differences in inkblot recognition amongst the groups, showing mood-dependent memory. Mood congruent judgment was observed for some of the memory ratings. This study paves the way for further investigation into memory differences of this sort in mood disorders.

A Comparison of Mood Effects on Memory Processes in Bipolar Disorder and Normal Controls: Recall, Recognition and Perception

There is substantial evidence that mood and memory dramatically affect one another. Since Bower's (1981) seminal paper "Mood and Memory", interest has burgeoned in exploring and attempting to explain the interactions. The literature mainly concentrates on three phenomena: mood-dependent memory (MDM), mood-congruent memory (MCM) and autobiographical memory specificity. This paper concentrates on the first two of these constructs in relation to clinical (bipolar disorder diagnosed) and control (no history of mental health problems) groups.

Mood and Memory

MDM refers to the finding that stimuli learnt or thought about in a given mood are recalled better when in the same mood. MCM refers to the finding that generated memories or judgments are often congruent with the current mood.

The standard paradigm to measure MDM involves a mood induction into a positive or negative mood, a memory task (encoding stage), then a mood induction into a similar or different state before attempting to retrieve information from the tasks (retrieval stage). Those whose encoding and retrieval mood are matched should perform better than those whose moods are different.

Even though this concept seems logical, MDM has been an elusive finding over the years. Eich (1995) and Eich and Macaulay (2000b) suggested boundary conditions under which MDM is most likely to occur. They identified three main determinants: features of the task, qualities of the mood states and characteristics of the participants. For MDM to occur, the task must be generated by participants. The mood state of participants must be strong, stable and genuine, as well as sufficiently dissimilar from their resting mood. The bigger the dissimilarity between encoding

and retrieval moods, the bigger the effect observed. Mood must last throughout the task and reflect a genuine state. Eich & Macaulay (2000a) looked into MDM and MCM in simulated moods and found an unusual effect of MCM but no MDM. Lastly, characteristics of participants play a substantial role in mediating mood effects. This will be discussed further below.

By contrast, MCM is a relatively stable effect to reproduce experimentally. Inducing contrasting moods and asking participants to complete a task, like autobiographical memory generation or word stem completion is the normal way to measure this. Happy participants generate more positive words or autobiographical memories than sad ones, wheras sad participants usually generate similar numbers of positive and negative items (an asymmetrical effect). However, broadening the field of research into social psychology has yielded very similar boundary conditions for mood congruency as for mood dependency. Indeed, there is evidence of mood-*in*congruent memory, suggested as a way of maintaining or achieving positive affect (e.g. Joormann & Siemer, 2004; Joormann, Siemer, & Gotlib, 2007; Josephson, Singer, & Salovey, 1996).

Amongst other models attempting to explain mood-congruency and mood-dependency, the affect infusion model (AIM: Forgas, 1995) outlines the boundary conditions for mood congruent social judgments but can be usefully applied to mood dependent memory (Eich & Macaulay, 2000b). Similar to Eich (1995), Forgas asserts that the three crucial determinants of mood effects, which he terms, *affect infusion*, are the features of the task, the situation and the judge. These influence affect infusion, through contributing to the choice of processing strategy. He outlines four processing strategies, *direct access*, *motivated*, *heuristic*, and *substantive*.

Relevant here are the processing strategies under which affect infusion is predicted to occur: *heuristic*, where participants use their mood as information in making judgments (the how-do-I-feel-about-it approach), and *substantive*, used in situations where the participant must generate responses to new, unusual or complex tasks (for a full description of this model, please see Bower & Forgas, 2000; Forgas, 1995). Within Eich & Macaulay's (2000b) theorising, MDM occurs in situations where the task is self-generated because this prompts substantive processing, causing infusion of the current affect into memory.

Bipolar Disorder

Bipolar disorder (BD) is characterised by episodes of depression and episodes of mania or hypomania. It is thought to affect about 1% of the adult population (Bebbington & Ramana, 1995), with high relapse and suicide rates (Judd et al., 2002; Mitchell, Slade, & Andrews, 2004), even with suitable medication. The course of the illness varies widely across individuals; some are able to lead successful and demanding lives, whereas others suffer more frequent, highly distressing mood swings.

There are often warning signs that a mood change is imminent, termed prodromes, and cognitive therapy has been shown to be effective for some sufferers in highlighting and managing these such that relapse into a clinical state may be prevented (Jones, 2004; Lam et al., 2003; Lam, Hayward, Watkins, Wright, & Sham, 2005).

However, there are those who do not benefit from this approach. The main difficulty appears to be managing onset of manic episodes. A closer look at this population revealed that those who relished early symptoms of mania were reluctant to take steps to prevent the symptoms escalating. Lam, Wright, & Sham (2005)

created a measure to draw a distinction between cognitive therapy responders and non-responders. They called this characteristic of non-responders sense of hyper-positive self. The sense of hyper-positive self scale (SHPSS) was used in this research.

Memory Differences in Bipolar Disorder

It is, however, unclear how memory processes in affective disorders might differ from those in non-clinical populations. Williams et al. (2007) and Johnson & Magaro (1987) have put forward models to explore mood and memory links in clinical populations. Williams et al. concentrate on the reasons for over-general memory in mood disorders, which is not the topic of this study. Johnson & Magaro concentrate on how the mood states of depression and mania affect memory. They comment that memory deficits associated with depression and mania are related to the severity of illness and are reversible outside of clinical episodes. The effort exerted (in both depressed and manic participants) and a conservative response bias (in depressed subjects) appear to mediate this relationship. Johnson & Magaro's (1987) model, while useful, will not be used here for two reasons, (a) participants in this study were all euthymic, and (b) this model does not elaborate on possible differences between clinical and non-clinical participants.

In attempting to make predictions about how memory processes might differ in mood disorders, it may be useful to refer to evidence relating to the moderating effect of personality variables on MCM, and then consider findings on these variables for the mood disorders. Rusting (Rusting, 1998; 1999; 2001) has published interesting reviews on the subject. Constructs such as extraversion and neuroticism have been shown to mediate mood congruent judgment, self-esteem, and what has been termed 'negative mood regulation' (NMR) (Bower & Forgas, 2000; Rusting,

2001). High scores on extraversion, NMR and self-esteem serve to prevent mood from affecting judgment and memory. High neuroticism, on the other hand, seems to enhance MCM. Within the AIM, these variables are interpreted as moderating the likelihood of an individual engaging in *motivated* processing to achieve a goal, such as mood repair.

Several studies have found correlations and interactions with personality variables amongst bipolar disorder diagnosed samples (Knowles et al., 2007; Murray, Goldstone, & Cunningham, 2007). Murray et al. found a link between higher levels of N and bipolar disorder characteristics, and higher levels of E associated with predisposition to mania. This suggests that individuals with bipolar disorder will show more affect infusion, particularly when in negative induced mood. Knowles et al. observed greater instability of self-esteem in bipolar individuals, which suggests that mood have a greater effect on memory and judgments in this group more than in those with more stable self-esteem.

Power, de Jong and Lloyd (2002) found that evidence that individuals with bipolar disorder showed self-concepts strongly compartmentalised between positive and negative ideas. This is shown by an entirely negative view of the self when in a negative mood and vice versa. More integration of these views is found in the non-clinical population. This suggests that mood change will have a more dramatic impact on how memories affect self-concept for bipolar participants.

In addition, Mansell, Morrison, Reid, Lowens and Tai (2007) theorised that bipolar individuals engage in "exaggerated attempts to enhance or control internal states" (p. 515) which result in maintenance or exacerbation of mood change. In a situation where mild mood change occurs (as in induced mood), it might be expected that this monitoring of internal mood states would result in ultimately futile attempts

to control or prevent mood change. This suggests that mood would have a greater impact on the bipolar participants' responses, drawing responses which, while attempting to avoid mood change, would ultimately reinforce it.

This evidence considered, it might be expected that individuals diagnosed with bipolar disorder might show greater affect infusion for memory (MDM and MCM) and judgments (perceptions of memories and self).

MDM and MCM in Bipolar Disorder

Two studies have investigated MDM and MCM in bipolar disorder (Eich, Macaulay, & Lam, 1997; Weingartner, Miller, & Murphy, 1977), both using natural mood variations. Weingartner et al. found mood-dependent memory for word associations in contrasting moods. Their findings were criticised by Blaney (1986) due to ambiguity about whether mood dependency or mood congruency was shown. In their paradigm, when recalling associations, it was unclear whether participants repeated the word association process anew (thereby showing mood congruent recall), or whether they tried to remember their previous associations (thereby showing mood dependent recall).

To rectify this, Eich et al. (1997) recruited ten participants diagnosed with rapid-cycling bipolar disorder to carry out memory tasks in varying moods. They saw participants on four occasions: odd-numbered occasions being used for encoding sessions and even-numbered occasions being used as retrieval sessions. The study consisted of three assessments of mood-dependency: autobiographical memory recall, inkblot recognition, and "letter association retention" (p.616). Participants generated memories that were congruent with their current mood, demonstrating MCM. MDM was found for autobiographical memories and inkblots but not for letter associations. Eich et al. explained these findings by suggesting that

letter associations offer “less room for state-specific interpretative processes to operate” (p.617).

The Present Research

This study aimed to expand on Eich et al.’s (1997) findings to explore whether there are differences between clinical and non-clinical participants on these tasks. The paradigm was similar to Eich et al., with some differences as will be explained.

Firstly, mood induction was used instead of natural mood variations. This was for a number of reasons: (a) it allowed control over the time lapse between encoding and retrieval, (b) it enabled equivalent treatment of the groups, (c) it allowed recruitment of a wider range of bipolar-diagnosed participants, and (d) it meant the experiment could be carried out on a single occasion with each participant.

Mood-dependent memory was assessed using autobiographical memory recall and inkblot recognition in matched and mismatched moods. The letter association task was not used as it did not demonstrate MDM in Eich et al.’s study.

Similarly to Eich et al. (1997), mood-congruency was assessed using pleasantness ratings of the generated memories. Eich et al. asked participants to rate memories for pleasantness, emotional intensity, vividness and personal importance at generation, but not recall. This study included these ratings at both stages to enable comparison of memory perception between moods.

In addition, the two most pleasant memories were compared against the adjectives on the SHPSS (Lam et al., 2005) at three stages; generation, recall and the end of the experiment. This enabled a closer look at how memory perception was affected by mood change, and how the perception of self within that memory might

change. This will measure mood congruent judgment, as shown in many social psychology experiments and as predicted by the AIM.

As bipolar disorder and its treatment can have a detrimental effect on memory performance (Bearden et al., 2006; Quraishi & Frangou, 2002), this was assessed using a simple word list recall task, adapted for use from the Wechsler Memory Scale – Third Edition (WMS-III: Wechsler, 1997). This was repeated as a delayed recall task.

Hypotheses

1. Mood-dependent memory will be found for all participants, shown by improved retrieval in matched mood conditions when compared to mismatched conditions, for the autobiographical memory recall and inkblot recognition tasks. MDM is not expected for word list recall.
2. Mood congruency will be shown by high mean ratings of pleasantness of autobiographical memories after the positive mood induction. This will indicate that the majority of memories recalled are pleasant.
3. The condition that participants are placed in will affect ratings of pleasantness, intensity, personal importance and vividness. Specifically, in matched conditions (after two positive mood inductions) ratings will be more similar to the first rating than in mismatched conditions (after one positive and one negative induction). Therefore, one would expect the difference between the first and second ratings to be greater in the mismatched group; those in positive moods will have higher mean ratings against the adjectives compared to those in negative moods.
4. The SHPSS ratings of the two most pleasant memories will show mood congruent judgment as in Hypothesis 3. That is, the ratings will change more for

those in different moods than for those in similar moods to before. Those in positive moods will show higher mean ratings against the adjectives compared to those in negative moods.

5. All of the above effects are expected to be more marked in those in the bipolar-diagnosed group, based on the evidence that certain personality variables associated with bipolar disorder are more likely to lead to affect infusion.

Method

Participants

The clinical (bipolar disorder diagnosed) group were recruited from three sources: a register of respondents to a newspaper advertisement calling for volunteers, voluntary organisations or through clinicians working with them. Before participation in the study, the bipolar disorder I diagnosis was confirmed using the Structured Clinical Interview for *DSM-IV* (SCID-IV; First, Spitzer, Gibbon & Williams, 2002). Participants who met criteria for mania alone or depression and mania were invited to participate in the study. The presence of comorbid Axis I disorders was not an exclusion criteria. The control group was also screened using the SCID-IV to ensure no history of mental health problems. Control participants were recruited from the first author's acquaintances (N = 18) and a local choir (N = 13). Informed written consent was obtained from all participants. The information sheet and consent form are at Appendix 7 and ethical and research governance approval letters at Appendix 6.

All participants completed the Beck Depression Inventory (BDI; Beck, Steer, & Garbin, 1988) and were observed using the Bech-Rafaelson Mania Rating Scale (MRS; Bech, 2002) to check for signs of depression or mania. Cut-offs of 16 and 5 were applied for the BDI and MRS respectively. Two participants, one in each group, were excluded for above-threshold scores on the BDI.

The final sample consisted of 58 participants (55.2% female; mean age = 45.7, *SD* = 11.1). Nearly all the participants were of White British ethnicity (96.6%) with one participant in each group not from Britain. 28 clinical participants and 30 controls took part.

Design and Procedure

This study employed a mixed between- and within-subjects design. The between-subjects variables were group (clinical or control) x condition (matched or mismatched mood).

In addition to mood questionnaires and the SCID-IV, participants completed the National Adult Reading Test (NART; Nelson & Willison, 1991) and the SHPSS (Lam et al., 2005). Copies of non-copyrighted measures and ratings scales are at Appendix 8. Following the screening procedures, the participant completed a visual analogue scale (VAS) indicating how they felt at that moment. This is described in more detail below. The structure of the procedure is at Figure 1, indicating points at which the VAS was administered.

The participants then watched the first, positive, mood induction, using film clips. Six noun cues were read aloud. After each cue, the participant generated a personal memory, briefly described it and rated it on a scale of 1-5 for pleasantness, intensity, personal importance, and vividness.

The participant selected the two most positive memories to rate against the adjectives from the SHPSS on a scale of 1-3. The request was phrased as such, "when you think of that memory, how confident does it make you feel? 0 means not all confident or it's irrelevant, and 3 means really confident".

Participants saw the four inkblots for five seconds each, rating each for aesthetic appeal on a scale of 1-5, as in Eich et al. (1997). The word lists from the WMS-III were then read aloud. The words were read at a rate of one per 1½ seconds.

At the end of the first part of the experiment, participants were randomly assigned into a matched or mismatched mood condition, and saw the appropriate

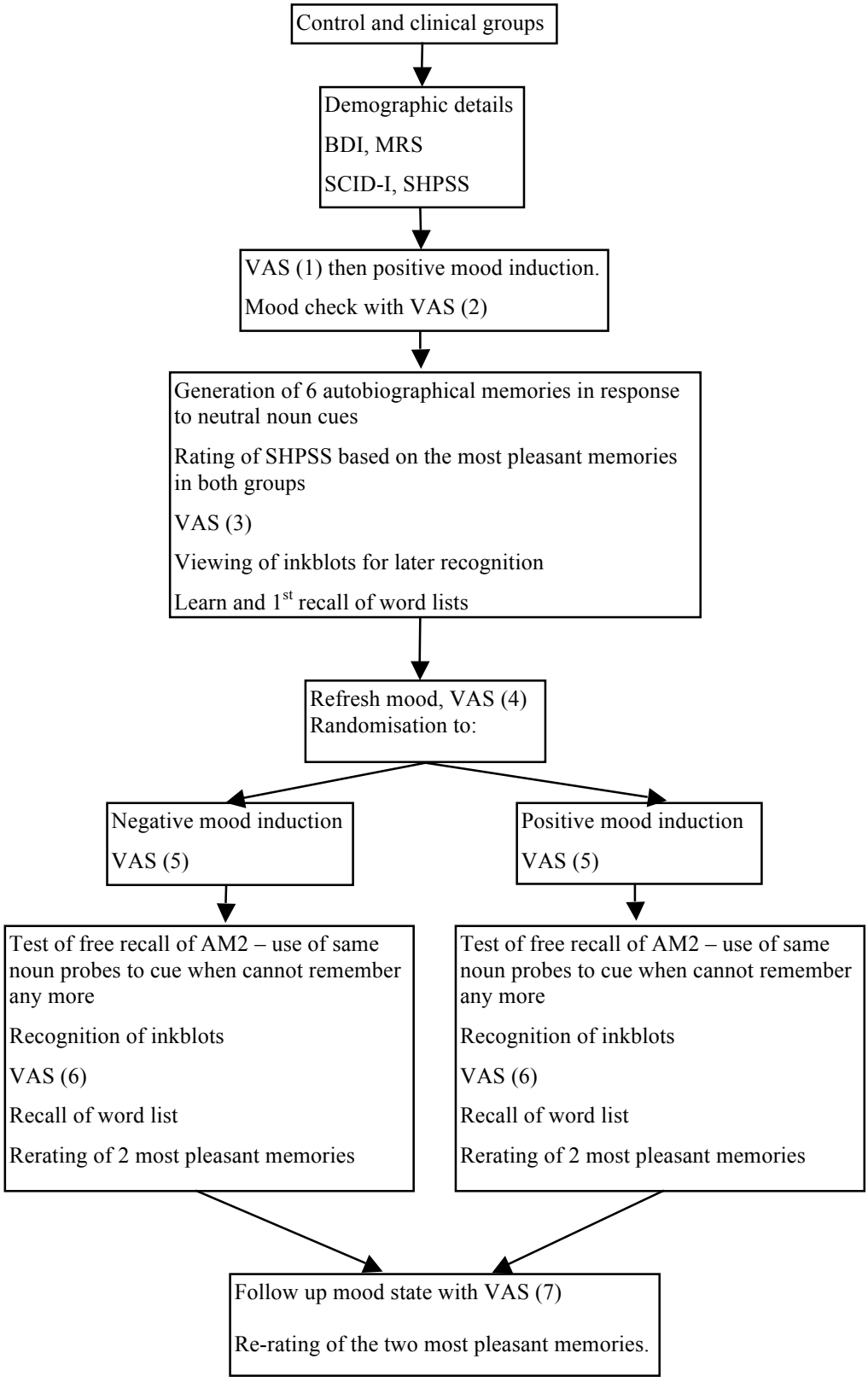

Figure 1. Diagram of the experimental paradigm.

film clips (positive or negative respectively). They then attempted to recall as many of the personal memories they had thought of before as possible, in any order. As

they recalled a memory, they re-rated it for pleasantness, intensity, vividness and personal importance. They then re-rated the two most pleasant memories against the SHPSS adjectives.

For the inkblot recognition, each inkblot was shown with five distractors, one of which was very close to the original. They then recalled as many words as possible from the word lists. Finally, the participants re-rated the two most pleasant memories against the adjectives from the SHPSS.

Screening Measures

BDI. The BDI (Beck et al., 1988) is a self-report questionnaire designed to measure levels of depressive symptomatology, widely validated to measure clinical and research outcomes for psychiatric and nonpsychiatric populations (Cronbach's α = .86 and .81, respectively). There are 21 items covering specific symptoms of depression, such as weight loss, feelings of guilt and suicidal ideation. These are rated from 0 to 4, yielding a maximum score of 63. For the clinical population, scores of 0 to 9 represent minimal depressive symptoms, scores between 10 and 16 indicate mild depressive symptoms, and scores above that are categorised as moderate – severe. The cut off for this study was 16, to allow for any residual depressive symptoms in the bipolar diagnosed group.

MRS. The MRS (Bech, 2002) is an observer-rated scale designed to assess for signs of mania, widely used in diagnosis and with high internal validity (Cronbach's α = 0.90). There are 11 items covering interpersonal interaction, sleep patterns and work ability, rated from 0 to 4, yielding a maximum score of 44. Scores below five indicate the absence of mania, between five and nine indicate hypomania (mild), and so on. The cut-off for this study was five.

SCID-IV. The SCID-IV (First et al., 2002) is a diagnostic interview designed to assess the presence of current and lifetime Axis I disorders. Modules to assess past major depression, mania, psychosis, anxiety disorders (including PTSD), substance dependence and eating disorders were administered. History of minor depression, hypomania or pain disorders was not assessed. The interviews were carried out by the first author who had received training and practice sessions. Consultation was sought to discuss difficult cases and, if necessary, another SCID-trained researcher repeated the interview. The interviews were recorded and another SCID-trained researcher heard four randomly selected interviews and agreed with the diagnoses.

Other Measures

NART-R (Nelson & Willison, 1991). This test was used to provide an estimate of premorbid cognitive ability. Scores correlate highly with Verbal and Full Scale IQ (FSIQ; Nelson & Willison, 1991). High levels of inter-rater (.96-.98) and test-retest (.98) reliability have been found (O'Carroll, 1987; Crawford et al. 1989, as cited by Nelson & Willison, 1991).

Sense of Hyper-Positive Self Scale (SHPSS; Lam et al., 2005). The SHPSS measures the extent to which bipolar patients perceive themselves to possess certain personal attributes (e.g. dynamism, persuasiveness and productiveness). Respondents rate both how they usually are and how they would ideally like to be. Lam et al. found high levels of internal consistency for the total score (Cronbach's α = .83) and for the component usual and ideal scores (Cronbach's α = .79 and .83, respectively). High scores on this scale are associated with a state of being 'mildly high', which does not reach the severity of clinical hypomania. There is evidence that highly valuing these personal attributes is associated with poorer outcomes of cognitive therapy (Lam et al., 2005).

Autobiographical memory word cues. Six words were selected from (Brown & Ure, 1969) stimulus words, chosen, as in Eich et al. (1997), for low emotionality and high concreteness. Words that were similar to others (e.g. *career*) were excluded and *health* was excluded due to the risk of a negative valence for clinical participants. The six words were *agency*, *errand*, *journey*, *mountain*, *school* and *story*.

Word Lists (I) subtest from Wechsler Memory Scale – Third Edition (WMS-III; Wechsler, 1997). These word lists were used for two reasons: to provide a distractor task from the autobiographical memory task and to provide a baseline measure of verbal memory. However, they were not used in a typical way.

List A and list B were presented only once, yielding two immediate recall scores which were averaged and age-scaled to between 1 and 19 from the WMS-II manual. This was used as an estimate of memory ability.

Participants were asked to recall the lists later and a similar process yielded an average delayed recall scaled score. The delayed word list scaled scores were taken from the immediate recall subtest rather than the delayed for a couple of reasons, (a) the interval was shorter than it would be in the context of administering the WMS and (b) participants only had one opportunity to hear the lists, so the scaled score would not be representative of their performance after repeated trials.

Inkblots. The researchers obtained copies of those used by Eich et al. (1997) from Professor Eich. The inkblots are abstract and multicoloured. The task used here was identical to the 1997 study, although the inkblots were shown on a 13.3" computer screen.

Film clips. Two-minute clips of six films were shown to induce mild mood changes, three each in each condition. The clips had been used effectively before in

one published study with those with bipolar disorder, Wright, Lam, & Newsom-Davis (2005), and in two unpublished doctoral theses. Those in the matched condition chose which clips to watch at the second induction.

Visual Analogue Scale (VAS). This was used to monitor mood throughout the experiment. It consisted of a 100mm line at which one end was the phrase "Saddest I've ever felt" at the other was "Happiest I've ever felt", and in the middle was "Neutral", allowing mood scores from 0 to 100. Participants completed this at seven points in the experiment. The first two were either side of the first, positive, mood induction. The difference between these scores was used to calculate the effectiveness of the first induction. The third VAS score was to monitor mood halfway through the procedure. If mood had reverted to baseline, participants could choose to watch another clip to refresh the induction.

The fourth and fifth VAS scores were taken before and after the second mood induction. The difference between these measured the effectiveness of the second mood induction. The sixth score monitored mood halfway through the memory tasks. If mood had returned to its state before the second induction, participants could choose to watch another clip as before.

The final, seventh, score provided a check of mood at the end of the procedure. If participants were feeling unhappy, time was spent to ensure they were debriefed thoroughly and felt better before the end of the experiment. The difference between this score and the first VAS score provides a measure of mood change between the start and end of the experiment.

Analyses

Parametric tests were necessary to test the main hypotheses due to increase flexibility in looking for interactive effects of group and condition as well as the individual effects of each,

Results

Group Characteristics

58 participants were suitable for inclusion in the analyses, 28 in the clinical group and 30 controls. The distribution of participants between the matched/mismatched conditions was 14/14 for clinical participants and 13/17 for controls respectively. Demographic characteristics and clinical features of the sample are given in Table 1 overleaf.

The groups did not differ significantly in terms of age, sex, marital status or employment status (Appendix 9). A chi square test revealed a significant difference between groups for education level (Chi-square statistic for trend = 8.86, $df = 1$, $p = .003$). 77% of the control group had a graduate or postgraduate qualification (N = 23) compared to 46% of the clinical group (N = 10). A Spearman's rank showed a significant correlation between estimated IQ and education level ($r = .35$, $p = .008$) as would be expected. Level of education is not likely to mediate the outcomes in this study beyond its influence on IQ and memory ability, so was not included as a covariate.

Independent samples t-tests revealed significant differences for estimated full-scale IQ and memory ability as measured by immediate recall of the word lists ($t(48.38) = -3.06$, $p = .004$ and $t(46.01) = -2.81$, $p = .007$ respectively, equal variances not assumed). The mean IQ level in the control group was 118.8 (SD =

Variable	Bipolar group	Control group
Mean age (*SD*) in years	47.25 (10.56)	44.23 (11.60)
Sex (male/female)	13/15	13/17
No. married	15	17
No. attaining A-level stage (equivalent to high school diploma) or above	18	28
No. employed (part-time or full-time)	18	20
Mean age (*SD*) of first mood episode	22.93 (10.43)	-
Mean no. (*SD*) of previous depressive episodes	13.75 (15.10)	-
Mean no. (*SD*) of previous manic episodes	11.18 (12.99)	-
Mean no. (*SD*) of previous hospital admissions for depression	2.39 (2.51)	-
Mean no. (*SD*) of previous hospital admissions for mania	2.11 (3.38)	-

Table 1. Demographic characteristics and clinical features of the sample.

5.07) and in the clinical group was 113.81 (*SD* = 7.15). Mean memory ability was 11.97 (*SD* = 2.27) and 9.79 (*SD* = 3.45) for control and clinical groups respectively. A Pearson's correlation revealed a significant correlation between estimated IQ and memory ability, $r = .322$, $p = .01$. Estimated IQ and memory ability were thus added as covariates to relevant outcomes.

In the clinical group, a group of correlations was carried out to look for the relationship between memory ability and the number of hospitalisations and clinical episodes. Pearson's correlations revealed no significant relationships between memory ability and the number of depressive or manic episodes, number of

hospitalisations for depression or mania or summed ($r \leq .15$ in all cases). This is in contradiction to previous evidence (Bearden et al., 2006) but it might be a reflection of the validity of the memory ability test as compared to comprehensive neuropsychological examination.

Screening Questionnaires

Mean scores on the BDI were compared for the control ($M = 3.07$, $SD = 3.22$) and clinical ($M = 7.04$, $SD = 4.70$) groups. An independent samples t-test showed BDI scores to be significantly lower in the control group than the clinical group, $t(56) = 3.77$, $p < .001$ (two-tailed, equal variances assumed). Mean scores on the MRS were not significantly different between the groups ($M = .71$, $SD = 1.05$ and $M = .33$, $SD = .66$ for clinical and control groups respectively). As depression can have an influence on memory, BDI scores were included as a covariate in the analyses.

SHPSS Scores

The control and clinical group were compared for their scores on the two parts of the scale (usual and ideal). An independent samples t-test suggested that the control group ($M = 26.73$, $SD = 4.78$) considered themselves usually more like the adjectives used than the clinical group ($M = 22.54$, $SD = 6.37$), $t(56) = 2.85$, $p = .006$ (two-tailed, equal variances assumed). The ideal part of the scale did not show this pattern ($t(56) = 1.82$, $p = .07$, two-tailed, equal variances assumed). The mean scores for the ideal part of the scale were 33.47 ($SD = 5.08$) and 31.00 ($SD = 5.25$) for control and clinical groups respectively. A t-test comparing the level of change between usual and ideal scores between the groups suggested that the clinical group were not significantly more likely to wish for a greater change in their perceived

levels of confidence, creativity, and so on, than the control group, $t(56) = 1.35$, $p = .18$ (two tailed, equal variances assumed).

Mood Manipulation Check

As explained in the method, the third and sixth scores were used to check the maintenance of mood and further film clips were shown if mood had changed since the mood induction, so these were excluded from the analysis. It was expected that the VAS scores would not show a normal distribution so nonparametric comparisons were carried out. To compare the efficacy of the inductions for the clinical and control groups as well as for the conditions, four groups were compared for the induction checks: control/clinical and matched/mismatched. These will be called "treatment groups".

The difference between the first and second VAS scores (either side of the first mood induction) yielded a measure of the success of the positive induction. The first mood induction showed a mean increase in mood for both groups, $M = 8.70$ ($SD = 7.71$) for the matched condition and $M = 12.74$ ($SD = 16.70$) for the mismatched condition (a positive number here indicates an improvement in mood). As expected, there were a number of outliers, particularly in the mismatched groups, and further analysis revealed these to be in the control group. A Kruskal-Wallis independent samples test indicated no significant difference between the four treatment groups at this stage, Chi-square approximation to Kruskal-Wallis = .69, $df = 3$, $p = .86$. This indicates that a significant majority of participants in each treatment group showed an improvement in their mood after the first mood induction.

The difference between the fourth and fifth VAS scores (either side of the second mood induction) yielded a measure of the success of the negative induction for the mismatched group, and the second positive induction for the matched group.

The second mood induction showed a divergence in the scores as expected. The matched groups showed a positive mean change of 10.48 (*SD* = 12.51), whereas the mismatched groups showed a negative mean change of -9.61 (SD = 17.04). The four treatment groups were compared using a Kruskal-Wallis comparison as before, and there was a significant difference between them, Chi-square = 23.14, *df* = 3, *p* < .001. This was caused by a lowering of mood in the two mismatched groups, supporting the conclusion that the matched group showed an improvement in mood and that the mismatched group showed a decline in mood.

The difference between the final and first VAS scores was calculated to observe mood change over the course of the experiment. These scores were then compared between the treatment groups. A Kruskal-Wallis independent samples test indicated no significant difference between the treatment groups regarding overall mood change, Chi-square = 4.01, *df* = 3, *p* = .26. However, looking at the mismatched condition, there appeared to be an overall deterioration in mood (*M* = -6.42, *SD* = 20.00). The standard deviation merited closer examination. A cross tabulation showed that in the mismatched group, 14 people worsened in mood, 11 improved, and seven showed no change. A stem-and-leaf plot showed that six participants worsened in mood by at least 20 points on the VAS in the mismatched groups (Appendix 9). The process of the experiment for the two groups had an impact on participants' mood that was still evident at the end of the experiment. It is worth noting, however, that all participants were debriefed to limit residual mood effects following this.

Experimental Hypotheses

All the hypotheses predicted differences in a particular direction, so all *p* values given from henceforth are one-tailed. Alpha level for significance is .05.

Mood Dependency

There were three ways mood dependency was tested in this experiment: recall of the words from the word lists, recall of the generated autobiographical memories, and recognition of the inkblots, which will be dealt with in turn. Table 2 shows the means and standard deviations of performance across the four groups on the memory tasks. Ordinal regression tables are at Appendix 9.

	Clinical		Control	
	Matched	Mismatched	Matched	Mismatched
Deterioration in memory performance	6.07 (2.53)	5.64 (3.30)	6.92 (2.96)	7.29 (2.54)
Inkblot recognition	3.00 (0.88)	2.43 (1.09)	2.54 (0.97)	2.82 (1.13)
No. of memories recalled without cues	3.93 (1.07)	3.29 (1.82)	4.62 (0.96)	4.47 (1.18)

Table 2. Means (and standard deviations) of memory performance on the three tasks measuring mood dependence.

Word list recall. The delayed recall scaled score was subtracted from the immediate recall score to get a measure of memory decay from the first trial. Overall memory ability should therefore not confound the measurement of mood dependency. This number may be seen as a measure of the deterioration of the individual's memory over time. ANOVAS were carried out to establish whether the experimental conditions and groups affected this deterioration. Hypothesis 1 predicted no effects. Estimated IQ and BDI score were covariates. The group x condition interaction was not significant (F (1, 52) = .27, p = .31), so the model was refitted without it, still yielding no significant effects (F (1, 53) = 1.78, p = .10, F (1,53) = .00, p = .50 for group and condition respectively).

Autobiographical memory recall. An ordinal regression was carried out to investigate the effect of group and condition on recall of generated autobiographical memories with estimated IQ, memory ability and BDI score as covariates. Due to the small number of low scorers, scores of 2 and below were recoded into a category of "two or fewer memories recalled". With and without the interaction, memory ability was significantly associated with the number of memories recalled (Wald test = 4.86, $df = 1$, $p = .01$, and Wald test = 5.10, $df = 1$, $p = .01$ with and without the interaction respectively).

Inkblot recognition. Another ordinal regression was carried out to investigate the effect of group and condition on inkblot recognition, with estimated IQ, memory ability and BDI score as covariates. The group x condition interaction showed a significant effect (Wald test = 2.94, $df = 1$, $p = .04$). A cross tabulation suggested that clinical participants performed better in the matched condition and control participants performed better in the mismatched condition (Table 3). The regression also found an effect of memory ability (Wald test = 3.00, $df = 1$, $p = .04$). Refitting the model without the interaction showed no more effects, although there was still an effect of memory ability (Wald test = 3.17, $df = 1$, $p = .04$).

		Number of inkblots recognised			
		1	2	3	4
Clinical	Matched	1	2	7	4
	Mismatched	3	5	3	3
Control	Matched	1	7	2	3
	Mismatched	3	3	5	6

Table 3. Cross-tabulation showing inkblot recognition performance across the groups.

Mood Congruency

Mood congruency was measured by looking at the pleasantness of the memories recalled after the first mood induction. Mood congruent memory would thus be found by the average pleasantness rating of the memories being above 50 at this point, because the mood induction improved people's moods (Hypothesis 2). The mean pleasantness rating for the whole sample, across the six memories they generated, was 64.75 (*SD* = 13.62). A closer look at the data revealed a narrow range of scores; only four participants had an average pleasantness rating of less than 50.

The mean pleasantness rating was compared across the groups in order to test Hypothesis 4 of a greater effect of mood congruence in the clinical group. An independent samples t-test found no significant difference between the mean ratings, $t(56) = -1.07$, $p = .15$. (one tailed, equal variances assumed). The mean ratings of memories were 62.77 (*SD* = 13.41) and 66.60 (*SD* = 13.79) for clinical and control groups respectively.

Changes in the Perceptions of Memories.

For the ratings of the six autobiographical memories, the average change in perception for each participant was calculated by subtracting the first rating from the second and calculating a mean change across the six memories. The ratings were viewed as a scale variable, 0 – 100, to provide more accurate representations of participants' ratings and to enhance the sensitivity of the measures. ANOVAs were carried out to look for differences between the matched and mismatched conditions in the variation in memory perception. It was expected that participants in the matched condition would show less change in their memory perceptions than those in the mismatched condition (Hypothesis 3). There was also expected to be an effect of group, such that those in the clinical group were expected to show more change in

their perceptions over time than those in the control group (Hypothesis 4). BDI was included as a covariate here, however estimated IQ and memory ability were not. Table 4 shows the means (and standard deviations) of the first and second ratings and the change on the four constructs across the groups.

	Clinical		Control	
	Matched	Mismatched	Matched	Mismatched
First rating of pleasantness	61.39 (13.46)	64.14 (13.71)	68.95 (16.26)	64.79 (11.76)
Second rating of pleasantness	62.61 (14.34)	60.45 (15.10)	66.21 (12.24	61.25 (11.25)
Change in pleasantness	1.21 (6.51)	-3.69 (6.88)	-2.74 (7.40)	-3.54 (12.77)
First rating of intensity	63.02 (13.79)	65.27 (14.95)	61.96 (13.66)	53.67 (10.97)
Second rating of intensity	57.00 (20.71)	65.20 (16.53)	56.91 (14.39)	46.20 (13.95)
Change in intensity	-6.02 (12.84)	-.07 (7.46)	-5.05 (5.34)	-7.47 (14.90)
First rating of importance	63.90 (18.81)	67.23 (14.55)	59.38 (17.30)	54.86 (10.67)
Second rating of importance	64.57 (22.48)	66.69 (15.77)	56.32 (17.55)	47.89 (14.70)
Change in personal importance	.67 (11.38)	-.54 (8.22)	-3.06 (6.45)	-6.97 (13.87)
First rating of vividness	69.62 (14.46)	76.35 (21.88)	67.35 (12.23)	63.29 (14.71)
Second rating of vividness	66.61 (18.07)	74.73 (22.35)	65.99 (10.55)	57.52 (16.32)
Change in vividness	-3.01 (10.69)	-1.62 (9.13)	-1.36 (7.50)	-5.77 (14.12)

Table 4. Means (SDs) of first and second ratings and changes on the four constructs across groups.

Pleasantness. There was no interaction effect between group and condition on the change in the perceived pleasantness of memories, $F(1, 53) = .24$, $p = .32$. Without the interaction in the model, there was no effect of group ($F(1, 54) = .00$, $p = .49$) or condition ($F(1, 54) = 1.07$, $p = .16$).

Emotional intensity. The group x condition interaction was not significant, $F(1, 53) = 2.29$, $p = .07$ Refitting the model without the interaction yielded no significant results; $F(1, 54) = .89$, $p = .18$ and $F(1, 54) = .33$, $p = .29$ for group and condition respectively.

Personal importance. The group x condition interaction did not significantly affect ratings of personal importance, $F(1, 53) = .47$, $p = .25$. No significant results were observed when the interaction was removed; $F(1, 54) = 1.76$, $p = .10$ and $F(1, 54) = .72$, $p = .20$ for group and condition respectively.

Vividness. There was no effect of group x condition interaction ($F(1, 53) = 1.73$, $p = .10$), or group ($F(1, 54) = .00$, $p = .50$) or condition ($F(1, 54) = .21$, $p = .33$) when the interaction was removed from the model.

Changes in the Perceptions of the Two Most Pleasant Memories

Changes in perception of the two most pleasant memories against the SHPSS were measured similarly to the previous ratings. As before, each adjective rating was treated on a scale of 0 -100. There were six rating occasions: two memories were rated at three time points. Cronbach's Alpha scores for internal consistency across the seven adjectives were calculated for each occasion the memories were rated, which ranged between .75 and .88. For this reason, an overall mean SHPSS rating was calculated for each rating occasion. The ratings for the different time points were also averaged, yielding one mean rating for each time point. The first rating occasion was subtracted from the second rating occasion, to yield a change between

the two conditions (first change). The first rating was subtracted from the third rating, to yield the change between the first part of the experiment and the end of the experiment (second change).

Analyses of variance were carried out for the first change and the second change, with the group x condition interaction included and excluded (full tables at Appendix 9).

First change. There was a significant effect of condition on the amount that ratings changed between the first and second SHPSS ratings, $F(1, 54) = 4.91$, $p = .01$. This effect was evident with and without the group x condition interaction included in the model. The interaction itself was not significant ($F(1,53) = 2.04$, $p = .08$), neither were any other effects. Table 5 shows that ratings were lower in the mismatched group at the second time point, whereas ratings were higher in the matched group, although both differences were more marked in the control group.

	Clinical		Control	
	Matched	Mismatched	Matched	Mismatched
First mean rating	71.99 (14.70)	68.90 (14.77)	60.60 (22.63)	71.96 (15.81)
Second mean rating	73.24 (14.63)	67.95 (16.43)	63.47 (20.78)	63.71 (18.35)
Third mean rating	72.93 (14.20)	67.22 (15.55)	61.61 (22.93)	66.18 (16.75)
First SHPSS change	1.25 (5.28)	-.94 (8.54)	2.86 (7.19)	-8.24 (17.95)
Second SHPSS change	.94 (8.48)	-1.67 (5.70)	1.01 (9.17)	-5.77 (17.30)

Table 5. The mean ratings and changes in SHPSS ratings over the three occasions.

Second change. There were no significant differences between ratings on the first and final occasions ($F(1,53) = .43$, $p = .25$ for the group x condition interaction;

$F(1,54) = .51$, $p = .24$ and $F(1,54) = 2.46$, $p = .06$ for group and condition without the interaction respectively).

Discussion

Main Findings

This experiment looked to compare mood effects on memory for bipolar disorder diagnosed participants and non-clinical controls. Mood-dependent memory (Hypothesis 1) was found for inkblot recognition, replicating Eich et al. (1997), although it was not found for word list recall or autobiographical memory. It appeared that matched mood helped clinical participants recall more inkblots, whereas control participants performed better in the mismatched condition. This provides some support for Hypothesis 5. The inkblot task was not explicitly a memory test; participants were asked to rate them for aesthetic appeal. Within the AIM, inkblots are complex stimuli that allow individual interpretation, leading to substantive processing. This would lead to MDM in both groups, however it was not observed for the control group. It is difficult to fit this finding into the model, as the other processing strategies are unlikely.

The interactive effect suggests that the clinical group showed greater affect infusion for the inkblots; furthermore, it is suggestive of a different processing style of ambiguous stimuli amongst the clinical group. It is possible that the inkblots were encoded more deeply by the bipolar participants, that they laid more of their current experience and emotion on their judgment of its aesthetics. Following this to a more practical level, this might indicate a need to understand and interpret ambiguity on a wider scale in everyday life, particularly when mood is high or low. This fits with cognitive theories of bipolar disorder (e.g. Mansell et al., 2007), which cite a spiral

of self-monitoring and exaggerated responses to minor changes in internal state (which may be ambiguous and not indicative of impending mood change).

This finding provides support for the differences in creative processing observed between those with bipolar disorder and non-clinical groups. Jamison (1993) and Santosa et al. (2007) offered extensive evidence for an association between bipolar illness and a superior level of creative ability. This association might help explain why an effect was observed for the inkblots but not for autobiographical memories. The finding of mood dependency for inkblots, if replicated, may shed light on the cognitive processing of images by individuals with bipolar disorder, and how that might differ from the non-bipolar population.

Mood-congruent retrieval was observed for all participants after the positive mood induction, to the extent that the mean pleasantness of memories was above neutral (Hypothesis 2). However, without a comparison group it is not possible to conclude that this shows MCM.

Mood-congruent judgment was observed for the SHPSS ratings of the memories between the first and second time point (Hypothesis 4). This was in the expected direction: those in a positive mood scored higher than those in a negative mood, although there was no significant interaction between group and condition (Hypothesis 5). However, the pleasantness, intensity, vividness and personal importance of memories did not change between conditions (Hypothesis 3), neither were there significant changes between the SHPSS ratings at the first and final time points.

Relating these results to the AIM (Forgas, 1995), ratings scales are likely to encourage a ‘how-do-I-feel-about-it’ heuristic approach, as participants make a quick reference to how they feel about the issue, using open but low effort

processing. As mentioned in the introduction, the heuristic approach often leads to mood congruence, although sometimes not when the source of affect is correctly attributed (e.g. Schwarz & Clore, 1983). It might have been that being aware of the source of their mood limited the effect it had on clinical participants' judgments. The finding is interesting for its isolated significance amongst the ratings scales carried out here. It is unclear whether this is indicative of a chance result, or whether another study with improved methodology would show differences for the other scales.

Strengths and Limitations of the Study

The strengths of this study also underpin its weaknesses. For example, comparing these effects between clinical and non-clinical populations represents a new approach. The likelihood of interpretable findings was maximised by using tasks that have yielded significant results in the past.

However, the technicalities of recruiting two groups restricted the design which, in turn, may help to explain why the expected differences were not observed. Firstly, participants were volunteers, so the experiment was carried out on a single occasion and was as brief as possible. Secondly, recruiting the maximum number of bipolar participants, whilst ensuring ethical practice meant, that large differences in mood were not used. It is likely that more dramatic effects would be observed using natural mood changes, as in Eich et al. (1997) and over longer time intervals. The short time intervals between tasks in this study meant that these were the same for all participants, but also increased the ceiling effect. In addition, the tasks were trimmed in order to minimise the length of the experiment, lowering the level of the challenge further. Thirdly, monitoring the efficacy of the mood induction may have drawn participants' attention to their feelings.

These compromises may have affected outcomes in a number of ways. The short-term, mild mood changes induced here may not have fulfilled Eich & Macaulay's (2000b) 'strong, stable and genuine' criteria. For this last criterion in particular, 'topping up' of the inductions halfway through the procedures is likely to have created a strong demand effect for mood change, lessening the genuineness of the feeling. However, demand characteristics have an unclear effect. On the one hand, second-guessing the experimental hypotheses may lead to greater effects on congruency measures but, on the other, being aware of the source of mood can inhibit congruency, as mentioned above.

In addition, it is not clear whether the "causal belonging hypothesis" (Bower & Forgas, 2000) was fulfilled in the respect of the autobiographical memories. Causal belonging should occur when the participants "relate their emotional reaction to the stimulus" (Bower & Forgas, 2000, p.97). They continue, "Temporal contiguity alone, without belongingness, will produce only weak or nonexistent associations" (Bower & Forgas, 2000, p.97).

It is possible that participants attributed feelings brought up by their autobiographical memories as unrelated to their current feelings. In addition, because recall was tested soon after generation, the situation was only different with respect of their emotional state, thereby being less distinctive.

Another important discussion point is the measure of memory ability. Since the word lists were not administered in the typical way, it could be argued that the scaled scores were not applicable and the construct was therefore not valid. However, it differentiated the clinical and control participants effectively. It also correlated as expected with estimated IQ and was a significant predictor of autobiographical memory recall and inkblot recognition, showing concordant

validity. It is thus considered a useful estimate of memory ability within the constraints of this study.

Finally and importantly, many measures of affect infusion were used in this study, particularly for mood congruent judgment, which was assessed using ratings of pleasantness, vividness, emotional intensity, personal importance and the SHPSS adjectives (for the two most pleasant memories). It is possible that the use of multiple comparisons here could explain the significant difference in SHPSS ratings as a chance significant result. Measures to control the effect of multiple comparisons could include dropping the significance level or using the Bonferroni correction. Using the Bonferroni correction would render both of the current findings non-significant. Mood-dependent memory was tested using two tasks, therefore the significance of the inkblot finding would be doubled, resulting in $p = .08$. Memory perception was investigated in six ways, resulting in $p = .06$ for the first SHPSS ratings change.

Future Directions

This study is important in opening up the field of mood congruency and mood dependency to direct comparisons of clinical and non-clinical populations. While weaknesses in the design may have adversely affected the likelihood of significant differences in recall and judgment, there are some significant differences between the groups, particularly regarding memory perception.

It is therefore reasonable to suppose that a longer study might be better able to capture these differences. In particular, the use of natural mood variations in the clinical group would be likely to maximise effects. This is likely to have an impact on recruitment, although attrition rates might be helped if participants could be paid. The difficulty with variation in intervals between generation and retrieval might be

controlled for using a matched control group that is recruited following completion of data collection from clinical participants. If this were to be carried out, the tasks would need to be expanded: more inkblots to recognise and autobiographical memories to recall and rate. In addition, the assessment of memory ability would ideally be more matched to the nature of the tasks, or would be more detailed or standardised. Assessment of IQ could be carried out using both a verbal and non-verbal tasks (such as a matrix reasoning task), which would be useful, considering the significance of the inkblot finding here.

Clinical Implications

This study has implications for clinical interventions with bipolar-diagnosed individuals. If these suggestions of hypervigilance and pre-emptive interpretation of ambiguous stimuli are supported by further research, there may be scope in exploring mindfulness-based techniques with this client group. The emphasis would be on observing what is and being able to accept what is without judgment.

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Joormann, J., & Siemer, M. (2004). Memory accessibility, mood regulation, and dysphoria: Difficulties in repairing sad mood with happy memories? *Journal of Abnormal Psychology, 113*(2), 179-188.

Joormann, J., Siemer, M., & Gotlib, I. H. (2007). Mood regulation in depression: Differential effects of distraction and recall of happy memories on sad mood. *Journal of Abnormal Psychology, 116*(3), 484-490.

Josephson, B. R., Singer, J. A., & Salovey, P. (1996). Mood regulation and memory: Repairing sad moods with happy memories. *Cognition and Emotion, 10*(4), 437-444.

Judd, L. L., Akiskal, H. S., Schetteler, P. J., Endicott, J., Maser, J., Solomon, D. A., et al. (2002). The long-term natural history of the weekly symptomatic status of bipolar I disorder. *Archives of General Psychiatry, 59*(6), 530-537.

Knowles, R., Tai, S., Jones, S. H., Highfield, J., Morriss, R., & Bentall, R. P. (2007). Stability of self-esteem in bipolar disorder: Comparisons among remitted bipolar patients, remitted unipolar patients and healthy controls. *Bipolar Disorders, 9*(5), 490-495.

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Mansell, W., Morrison, A. P., Reid, G., Lowens, I., & Tai, S. (2007). The interpretation of, and responses to, changes in internal states: An integrative cognitive model of mood swings and bipolar disorders. *Behavioural and Cognitive Psychotherapy, 35*(5), 515-539.

Mitchell, P. B., Slade, T., & Andrews, G. (2004). Twelve-month prevalence and disability of DSM-IV bipolar disorder in an australian general population survey. *Psychological Medicine, 34*(5), 777-785.

Murray, G., Goldstone, E., & Cunningham, E. (2007). Personality and the predisposition(s) to bipolar disorder: Heuristic benefits of a two-dimensional model. *Bipolar Disorders, 9*(5), 453-461.

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Quraishi, S., & Frangou, S. (2002). Neuropsychology of bipolar disorder: A review. *Journal of Affective Disorders, 72*(3), 209-226.

Rusting, C. L. (1998). Personality, mood, and cognitive processing of emotional information: Three conceptual frameworks. *Psychological Bulletin, 124*(2), 165-196.

Rusting, C. L. (1999). Interactive effects of personality and mood on emotion-congruent memory and judgment. *Journal of Personality & Social Psychology, 77*(5), 1073-1086.

Rusting, C. L. (2001). Personality as a moderator of affective influences on cogntion. In J. P. Forgas (Ed.), *Handbook of affect and social cognition.* (pp. 371-391). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Santosa, C. M., Strong, C. M., Nowakowska, C., Wang, P. W., Rennicke, C. M., & Ketter, T. A. (2007). Enhanced creativity in bipolar disorder patients: A controlled study. *Journal of Affective Disorders, 100*(1-3), 31-39.

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Wechsler, D. (1997). *The Wechsler Memory Scale – Third Edition*. London: The Psychological Corporation.

Weingartner, H., Miller, H., & Murphy, D. L. (1977). Mood-state-dependent retrieval of verbal associations. *Journal of Abnormal Psychology, 86*(3), 276-284.

Williams, J. M. G., Barnhofer, T., Crane, C., Hermans, D., Raes, F., Watkins, E., et al. (2007). Autobiographical memory specificity and emotional disorder. *Psychological Bulletin, 133*(1), 122-148.

Wright, K., Lam, D., & Newsom-Davis, I. (2005). Induced mood change and dysfunctional attitudes in remitted bipolar I affective disorder. *Journal of Abnormal Psychology, 114*(4), 689-696.

Wyland, C. L., & Forgas, J. P. (2007). On bad mood and white bears: The effects of mood state on ability to suppress unwanted thoughts. *Cognition & Emotion, 21*(7), 1513-1524.

PART THREE: APPENDIXES

Appendix 1

Excluded Experimental Articles

Albarracín, D., & Wyer, R. S. J. (2001). Elaborative and nonelaborative processing of a behavior-related communication. *Personality and Social Psychology Bulletin, 27*(6), 691-705.

Alter, A. L., & Forgas, J. P. (2007). On being happy but fearing failure: The effects of mood on self-handicapping strategies. *Journal of Experimental Social Psychology, 43*(6), 947-954.

Au, K., Chan, F., Wang, D., & Vertinsky, I. (2003). Mood in foreign exchange trading: Cognitive processes and performance. *Organizational Behavior and Human Decision Processes, 91*(2), 322-338.

Beedie, C. J., Terry, P. C., & Lane, A. M. (2005). Distinctions between emotion and mood. *Cognition & Emotion, 19*(6), 847-878.

Belke, B., Leder, H., & Augustin, M. D. (2006). Mastering style--effects of explicit style-related information, art knowledge and affective state on appreciation of abstract paintings. *Psychology Science, 48*(2), 115-134.

Bentall, R. P., & Kaney, S. (2005). Attributional lability in depression and paranoia. *British Journal of Clinical Psychology, 44*, 475-488.

Bohner, G., & Weinerth, T. (2001). Negative affect can increase or decrease message scrutiny: The affect interpretation hypothesis. *Personality and Social Psychology Bulletin, 27*(11), 1417-1428.

Carson, L., Drummond, J., & Newton, J. (2004). Social perception in the clinical dental encounter: The matched-guise technique re-visited. *Psychology & Health, 19*(5), 667-683.

Cesario, J., Grant, H., & Higgins, E. T. (2004). Regulatory fit and persuasion: Transfer from 'feeling right.'. *Journal of Personality and Social Psychology, 86*(3), 388-404.

Chou, K. L., Lee, T. M., & Ho, A. H. (2007). Does mood state change risk taking tendency in older adults?. *Psychology & Aging, 22*(2), 310-318.

Damen, F., van Knippenberg, B., & van Knippenberg, D. (2008). Affective match in leadership: Leader emotional displays, follower positive affect, and follower performance. *Journal of Applied Social Psychology, 38*(4), 868-902.

Das, E. H. H. J., de Wit, J. B. F., & Stroebe, W. (2003). Fear appeals motivate acceptance of action recommendations: Evidence for a positive bias in the processing of persuasive messages. *Personality and Social Psychology Bulletin, 29*(5), 650-664.

DeSteno, D., Dasgupta, N., Bartlett, M. Y., & Cajdric, A. (2004). Prejudice from thin air: The effect of emotion on automatic intergroup attitudes. *Psychological Science, 15*(5), 319-324.

DeSteno, D., Petty, R. E., Rucker, D. D., Wegener, D. T., & Braverman, J. (2004). Discrete emotions and persuasion: The role of emotion-induced expectancies. *Journal of Personality and Social Psychology, 86*(1), 43-56.

DeSteno, D., Petty, R. E., Wegener, D. T., & Rucker, D. D. (2000). Beyond valence in the perception of likelihood: The role of emotion specificity. *Journal of Personality and Social Psychology, 78*(3), 397-416.

Edwards, R., & Bello, R. (2001). Interpretations of messages: The influence of equivocation, face concerns, and ego-involvement. *Human Communication Research, 27*(4), 597-631.

Eiser, J. R., Pahl, S., & Prins, Y. R. A. (2001). Optimism, pessimism, and the direction of self-other comparisons. *Journal of Experimental Social Psychology, 37*(1), 77-84.

Fiedler, K., Nickel, S., Muehlfriedel, T., & Unkelbach, C. (2001). Is mood congruency an effect of genuine memory or response bias? *Journal of Experimental Social Psychology, 37*(3), 201-214.

Fivush, R., Hazzard, A., Sales, J. M., Sarfati, D., & Brown, T. (2003). Creating coherence out of chaos? children's narratives of emotionally positive and negative events. *Applied Cognitive Psychology, 17*(1), 1-19.

Fodor, E. M., & Carver, R. A. (2000). Achievement and power motives, performance feedback, and creativity. *Journal of Research in Personality, 34*(4), 380-396.

Freitas, A. L., & Higgins, E. T. (2002). Enjoying goal-directed action: The role of regulatory fit. *Psychological Science, 13*(1), 1-6.

Gendolla, G. H. E., Abele, A. E., & Krüsken, J. (2001). The informational impact of mood on effort mobilization: A study of cardiovascular and electrodermal responses. *Emotion, 1*(1), 12-24.

Gobbo, C., & Raccanello, D. (2007). How children narrate happy and sad events: Does affective state count? *Applied Cognitive Psychology, 21*(9), 1173-1190.

Goddard, L., Dritschel, B., & Burton, A. (2001). The effects of specific retrieval instruction on social problem-solving in depression. *British Journal of Clinical Psychology, 40*(3), 297-297.

Gorassini, D. R. (2002). Request-to-suggestion carryover:When responses to requests affect responses to suggestions. *Contemporary Hypnosis, 19*(4), 172-172.

Gramzow, R. H., Gaertner, L., & Sedikides, C. (2001). Memory for in-group and out-group information in a minimal group context: The self as an informational base. *Journal of Personality and Social Psychology, 80*(2), 188-205.

Green, J. D., Sedikides, C., Saltzberg, J. A., Wood, J. V., & Forzano, L. B. (2003). Happy mood decreases self-focused attention. *British Journal of Social Psychology, 42*(1), 147-157.

Herrald, M. M., & Tomaka, J. (2002). Patterns of emotion-specific appraisal, coping, and cardiovascular reactivity during an ongoing emotional episode. *Journal of Personality and Social Psychology, 83*(2), 434-450.

Hickie, I. B., Christensen, H., Davenport, T. A., & Luscombe, G. M. (2005). Can we track the impact of australian mental health research? *Australian & New Zealand Journal of Psychiatry, 39*(7), 591-599.

Hlebec, V., & Ferligoj, A. (2001). Respondent mood and the instability of survey network measurements. *Social Networks, 23*(2), 125-139.

Hsiao, F. H., Klimidis, S., Minas, H. I., & Tan, E. S. (2006). Folk concepts of mental disorders among chinese-australian patients and their caregivers. *Journal of Advanced Nursing, 55*(1), 58-67.

Kempeneers, P., Andrianne, R., & Mormont, C. (2004). Penile prosthesis, sexual satisfaction and representation of male erotic value. *Sexual & Relationship Therapy, 19*(4), 379-392.

Khalek, A. M. (2006). Happiness, health, and religiosity: Significant relations. *Mental Health, Religion & Culture, 9*(1), 85-97.

Krauth-Gruber, S., & Ric, F. (2000). Affect and stereotypic thinking: A test of the mood-and-general-knowledge-model. *Personality and Social Psychology Bulletin, 26*(12), 1587-1597.

Lerner, J. S., & Keltner, D. (2000). Beyond valence: Toward a model of emotion-specific influences on judgement and choice. *Cognition & Emotion, 14*(4), 473-493.

Lerner, J. S., & Keltner, D. (2001). Fear, anger, and risk. *Journal of Personality and Social Psychology, 81*(1), 146-159.

Lewis, C. A., & Cruise, S. M. (2006). Religion and happiness: Consensus, contradictions, comments and concerns. *Mental Health, Religion & Culture, 9*(3), 213-225.

Lipkus, I. M., Pollak, K. I., McBride, C. M., Schwartz-Bloom, R., Lyna, P., & Bloom, P. N. (2005). Assessing attitudinal ambivalence towards smoking and its association with desire to quit among teen smokers. *Psychology & Health, 20*(3), 373-387.

Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin, 127*(2), 267-286.

Mackie, D. M., Devos, T., & Smith, E. R. (2000). Intergroup emotions: Explaining offensive action tendencies in an intergroup context. *Journal of Personality and Social Psychology, 79*(4), 602-616.

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Meijnders, A. L., Midden, C. J. H., & Wilke, H. A. M. (2001). Communications about environmental risks and risk-reducing behavior: The impact of fear on information processing. *Journal of Applied Social Psychology, 31*(4), 754-777.

Miranda, R., & Kihlstrom, J. F. (2005). Mood congruence in childhood and recent autobiographical memory. *Cognition & Emotion, 19*(7), 981-998.

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Nelson, D. L., Goodmon, L. B., & Ceo, D. (2007). How does delayed testing reduce effects of implicit memory: Context infusion or cuing with context?. *Memory & Cognition, 35*(5), 1014-1023.

Nelson, K. L., & Horowitz, L. M. (2001). Narrative structure in recounted sad memories. *Discourse Processes, 31*(3), 307-324.

Nemeth, R. J. (2002). The impact of gruesome evidence on mock juror decision making: The role of evidence characteristics and emotional response. (Ph.D., Louisiana State University and Agricultural & Mechanical College).

Pahl, S., & Eiser, J. R. (2006). The focus effect and self-positivity in ratings of self-other similarity and difference. *British Journal of Social Psychology, 45*(1), 107-116.

Park, J., & Banaji, M. R. (2000). Mood and heuristics: The influence of happy and sad states on sensitivity and bias in stereotyping. *Journal of Personality and Social Psychology, 78*(6), 1005-1023.

Pfau, M., Szabo, E. A., Anderson, J., Morrill, J., Zubric, J., & Wan, H. (2000). The role and impact of affect in the process of resistance to persuasion. *Human Communication Research, 27*(2), 216-252.

Pfau, M., Wittenberg, E. M., Jackson, C., Mehringer, P., Lanier, R., Hatfield, M., et al. (2005). Embedding journalists in military combat units: How embedding alters television news stories. *Mass Communication and Society, 8*(3), 179-195.

Polya, T., Laszlo, J., & Forgas, J. P. (2005). Making sense of life stories: The role of narrative perspective in perceiving hidden information about social identity. *European Journal of Social Psychology, 35*(6), 785-796.

Polya, T., Laszlo, J., & Forgas, J. P. (2005). Making sense of life stories: The role of narrative perspective in perceiving hidden information about social identity. *European Journal of Social Psychology, 35*(6), 785-796.

Rafienia, P., Azadfallah, P., Fathi-Ashtiani, A., & Rasoulzadeh-Tabatabaiei, K. (2008). The role of extraversion, neuroticism and positive and negative mood in emotional information processing. *Personality and Individual Differences, 44*(2), 392-402.

Sedikides, C., & Green, J. D. (2000). On the self-protective nature of inconsistency-negativity management: Using the person memory paradigm to examine self-referent memory. *Journal of Personality and Social Psychology, 79*(6), 906-922.

Sedikides, C., & Green, J. D. (2004). What I don't recall can't hurt me: Information negativity versus information inconsistency as determinants of memorial self-defense. *Social Cognition, 22*(1), 4-29.

Smith, A. K., & Bolton, R. N. (2002). The effect of customers' emotional responses to service failures on their recovery effort evaluations and satisfaction judgments. *Journal of the Academy of Marketing Science, 30*(1), 5-23.

Terwogt, M. M. (2002). Emotional states in self and others as motives for helping in 10-year-old children. *British Journal of Developmental Psychology, 20*(1), 131-147.

Tiedens, L. Z., & Linton, S. (2001). Judgment under emotional certainty and uncertainty: The effects of specific emotions on information processing. *Journal of Personality and Social Psychology, 81*(6), 973-988.

Vermeulen, N., Luminet, O., & Corneille, O. (2006). Alexithymia and the automatic processing of affective information: Evidence from the affective priming paradigm. *Cognition & Emotion, 20*(1), 64-91.

Wegge, J., Van Dick, R., Fisher, G., Wecking, C., & Moltzen, K. (2006). Work motivation, organizational identification, and well-being in call centre work. *Work & Stress, 20*(1), 60-83.

Wyland, C. L., & Forgas, J. P. (2007). On bad mood and white bears: The effects of mood state on ability to suppress unwanted thoughts. *Cognition & Emotion, 21*(7), 1513-1524.

Appendix 2

Checklist for Study Quality (based on Downs & Black, 1998)

Names

Year

Journal

Topic

1. Is the hypothesis/aim of the study clearly described?

Yes	1
No	0

2. Are the main outcomes to be measured clearly described in the Introduction or Methods section?

Yes	1
No	0

3. Are the characteristics of the patients included in the study clearly described?

Yes	1
No	0

4. Are the distributions of principal confounders in each group of subjects to be compared clearly described?

Yes	1
No	0

5. Are the main findings of the study clearly described?

Yes	1
No	0

6. Does the study provide estimates of the random variability in the data for the main outcomes?

Yes	1
No	0

7. Have the characteristics of participants lost to follow-up been described?

Yes	1
No	0
Not applicable	-

8. Have actual probability values been reported (e.g. 0.035 rather than <0.05) for the main outcomes except where the probability value is less than 0.001?

Yes	1
No	0

Were participants representative of the entire population from which they were recruited?

Yes	1
No	0
Unable to determine	0

9. Was an attempt made to blind study subjects to the intervention they have received?

Yes	1
No	0
Unable to determine	0
Not applicable	-

10. Was an attempt made to blind those measuring the main outcomes of the intervention?

Yes	1

No	0
Unable to determine	0
Not applicable	-

11. If any of the results of the study were based on "data dredging" was this made clear?

Yes	1
No	0
Unable to determine	0
Not applicable	-

12. In trials and cohort studies, do the analyses adjust for different lengths of follow-up of ppts, or in case-control studies, is the time period between the intervention and outcome the same for cases and controls?

Yes	1
No	0
Unable to determine	0
Not applicable	-

13. Were the statistical tests used to assess the main outcomes appropriate?

Yes	1
No	0
Unable to determine	0

14. Were efforts were made to limit demand characteristics if there was a mood induction?

Yes	1
No	0

Unable to determine	0

15. Was the mood induction effective? Statistical tests used to test this?

Yes	1
No	0

16. Were the main outcomes measures used accurate (valid and reliable)?

Yes	1
No	0
Unable to determine	0

17. Were ppts in different groups recruited from the same population and period of time, if appropriate?

Yes	1
No	0
Unable to determine	0

18. Were study subjects randomised to experimental conditions?

Yes	1
No	0
Unable to determine	0

19. Was there adequate adjustment for confounding in the analyses from which the main findings were drawn?

Yes	1
No	0
Unable to determine	0

20. Was loss to follow-up taken into account?

Yes	1

No	0
Unable to determine	0
Not applicable	-

21. Did the study have sufficient power to detect a clinically important effect where the probability value for difference being due to chance is <5%?

	Size of smallest exp. group	
A	$<n_1$	0
B	n_1-n_2	1
C	n_3-n_4	2
D	n_5-n_6	3
E	n_7-n_8	4
F	n_8+	5

Other relevant statistical test:

Aspect of AIM tested:

AIM supported?

Yes	1
No	0
Unable to determine	0

Appendix 3

Search Strategies for Databases

Web of science search method 10/5/08 (102 results)

TS=affect and TS=infusion and TS=model

Timespan=All Years. Databases=SCI-EXPANDED, SSCI, A&HCI.

Refined by: Subject Areas=(NEUROSCIENCES OR PSYCHOLOGY, BIOLOGICAL OR PSYCHOLOGY, EXPERIMENTAL OR PSYCHOLOGY, MULTIDISCIPLINARY OR CLINICAL NEUROLOGY OR PSYCHOLOGY OR PSYCHOLOGY, CLINICAL OR HEALTH CARE SCIENCES & SERVICES OR PSYCHOLOGY, SOCIAL OR PSYCHIATRY OR MULTIDISCIPLINARY SCIENCES OR NEUROIMAGING OR BEHAVIORAL SCIENCES OR PSYCHOLOGY, APPLIED OR PSYCHOLOGY, DEVELOPMENTAL) > Publication Years=(2007 OR 2002 OR 1996 OR 1998 OR 2003 OR 2005 OR 2006 OR 1995 OR 2008 OR 2004 OR 1999 OR 1997 OR 2001 OR 2000)

Ovid Medline 1950-present and in process search method 10/5/08 (19 results)

affect infusion model 10_5

1. (affect adj infusion adj model).mp. [mp=title, original title, abstract, name of substance word, subject heading word]

2. affect.mp. or exp Affect/

3. Cognition/ or Affect/ or Social Behavior/ or forgas.mp. or Personality/

4. infusion.mp.

5. (theor$ or model$).mp. [mp=title, original title, abstract, name of substance word, subject heading word]

6. 2 and 3 and 4 and 5

PsychINFO 10/5/08 (70 results)

1) Looked for articles that cited this (*35 results*):

Forgas, J. P. (1994). The role of emotion in social judgments: An introductory review and an Affect Infusion Model (AIM). *European Journal of Social Psychology*, *24*(1), p. 1-24.

2) (Affect and infusion and model) AND forgas in any field

limited to 1995 – 2008

CINAHL with full text 10/5/08 (14 results)

1) Affect and infusion and model too general (*53 results*, few relevant)

2) Forgas any field

Restricted to 1995 – 2008

English

Special interest: Psychiatry/psychology

Expanders:

Apply additional terms to query

Also search within the full text of the articles

Automatically "And" search terms

Appendix 4

Instructions for Authors - Cognition and Emotion

(from http://www.tandf.co.uk/journals/authors/pcemauth.asp)

Note to Authors: please make sure your contact address information is clearly visible on the outside of all packages you are sending to Editors.

Submission of Manuscripts:

Authors are encouraged to submit papers electronically to expedite the peer review process. Please email your paper, saved in a standard document format type such as Word or PDF, to Duncan.nicholas@psypress.co.uk. You may also contact the Editorial Assistant by phone on (0)2070 177730.

List the following information in the body of your email: full contact details, the title of your article, the abstract, and whether you wish to submit the manuscript for publication as a regular article or as a brief report.

You should also confirm that the manuscript is not currently under consideration for publication elsewhere.

Manuscripts that describe only one experiment should typically be submitted as a brief report. The main text of a brief report (including footnotes) should contain no more than 4000 words. Brief reports should include a maximum of two tables or figures and 25 references.

All manuscripts should be submitted in American Psychological Association (APA) format following the latest edition of Publication Manual of the APA (currently 5th edition).

FORMAT

Typescripts. The style and format of the typescripts should conform to the specifications given in the Publication Manual of the American Psychological Association (5th edition).

Typescripts should be double spaced on one side only of A4 paper, with adequate margins, and numbered throughout. The title page of an article should contain only:

(1) the title of the paper, the name(s) and address(es) of the author(s);

(2) a short title not exceeding 40 letters and spaces, which will be used for page headlines;

(3) name and address of the author to whom correspondence and proofs should be sent;

(4) your telephone, fax and e-mail numbers, as this helps speed of processing considerably.

Abstract. An abstract of 100-150 words should follow the title page on a separate sheet.

Headings. Indicate headings and subheadings for different sections of the paper clearly. Do not number headings.

Acknowledgements. These should be as brief as possible and typed on a separate sheet at the beginning of the text.

Permission to quote. Any direct quotation, regardless of length, must be accompanied by a reference citation that includes a page number. Any quote over six manuscript lines should have formal written permission to quote from the copyright owner. It is the author's responsibility to determine whether permission is required from the copyright owner and, if so, to obtain it. (See the bottom of the page for a template of a letter seeking copyright permission.)

Footnotes. These should be avoided unless absolutely necessary. Essential footnotes should be indicated by superscript figures in the text and collected on a separate sheet at the end of the manuscript.

Reference citations within the text. Use authors' last names, with the year of publication in parentheses after the last author's name, e.g., "Jones and Smith (1987)"; alternatively, "(Brown, 1982; Jones & Smith, 1987; White, Johnson, & Thomas, 1990)". On first citation of references with three to six authors, give all names in full, thereafter use first author "et al.". If more than one article by the same author(s) in the same year is cited, the letters a, b, c, etc. should follow the year.

Reference list. A full list of references quoted in the text should be given at the end of the paper in alphabetical order of authors' surnames (or chronologically for a group of references by the same authors), commencing as a new sheet, typed double spaced. Titles of journals and books should be given in full, e.g.:

Books:

Baddeley, A. D. (1999). *Essentials of human memory*. Hove, UK: Psychology Press.

Chapter in edited book:

Plomin, R., & Dale, P. S. (2000). Genetics and early language development: A UK study of twins. In D. V. M. Bishop & L. B. Leonard (Eds.), *Speech and language impairments in children: Causes, characteristics, intervention and outcome* (pp. 35-51). Hove, UK: Psychology Press.

Journal article:

Schwartz, M. F., & Hodgson, C. (2002). A new multiword naming deficit: Evidence and interpretation. *Cognitive Neuropsychology*, 19, 263-288.

Tables. These should be kept to the minimum. Each table should be typed double spaced on a separate sheet, giving the heading, e.g., "Table 2", in Arabic numerals, followed by the legend, followed by the table. Make sure that appropriate units are given. Instructions for placing the table should be given in parentheses in the text, e.g., "(Table 2 about here)".

Figures. Figures should only be used when essential. The same data should not be presented both as a figure and in a table. Where possible, related diagrams should be grouped together to form a single figure. Figures should be drawn to professional standards and it is recommended that the linear dimensions of figures be approximately twice those intended for the final printed version. Each of these should be on a separate page, not integrated with the text. Figures will be reproduced directly from originals supplied by the author(s). These must be of good quality, clearly and completely lettered. Make sure that axes of graphs are properly labelled, and that appropriate units are given. Photocopies will reproduce poorly, as will pale or broken originals. Dense tones should be avoided, and never combined with lettering. Half-tone figures should be clear, highly-contrasted black and white glossy prints.

Black and white figures are included free of charge. Colour figures are not normally acceptable for publication in print -- however, it may be possible both to print in black and white and to publish online in colour. Colour figures will only be printed by prior arrangement between the editor(s), publisher and author(s); and authors may be asked to share the costs of inclusion of such figures.

The figure captions should be typed in a separate section, headed, e.g., "Figure 2", in Arabic numerals. Instructions for placing the figure should be given in parentheses in the text, e.g., "(Figure 2 about here)". More detailed Guidelines for the Preparation of Figure Artwork are available from the publisher: Psychology Press Ltd, 27 Church Road, Hove, East Sussex BN3 2FA, UK (Email: authorqueries@tandf.co.uk).

Statistics. Results of statistical tests should be given in the following form:

"... results showed an effect of group, $F(2, 21) = 13.74$, $MSE = 451.98$, $p < .001$, but there was no effect of repeated trials, $F(5, 105) = 1.44$, $MSE = 17.70$, and no interaction, $F(10, 105) = 1.34$, $MSE = 17.70$."

Other tests should be reported in a similar manner to the above example of an F -ratio. For a fuller explanation of statistical presentation, see pages 136-147 of the *APA Publication Manual* (5th ed.). For guidelines on presenting statistical significance, see pages 24-25.

Abbreviations. Abbreviations that are specific to a particular manuscript or to a very specific area of research should be avoided, and authors will be asked to spell out in full any such abbreviations throughout the text. Standard abbreviations such as RT for reaction time, SOA for stimulus onset asynchrony or other standard abbreviations that will be readily understood by readers of the journal are acceptable. Experimental conditions should be named in full, except in tables and figures.

AFTER ACCEPTANCE OF PUBLICATION IN THE JOURNAL

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typescript will be permitted at this stage. A list of queries raised by the copy editor will also be emailed. Proofs should be returned promptly with the original copy-edited manuscript and query sheet.

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Yours faithfully

Volume contents and author index. The list of contents and the author index for the whole of the year's issues are published in the last issue of the year of each journal. For Cognition and Emotion, this is issue 8 (November).

Appendix 5

Journal of Abnormal Psychology – Author guidelines

Taken from http://www.apa.org/journals/abn/submission.html

Editor: David Watson, PhD

ISSN: 0021-843x

Published Quarterly, beginning in February

Instructions to Authors

Please consult APA's Instructions for All Authors for information regarding

* Manuscript Preparation
* Submitting Supplemental Materials
* Abstract and Keywords
* References
* Figures
* Permissions
* Publication Policies
* Ethical Principles

Submission

Submit manuscripts electronically (in .rtf or .doc format) via the Manuscript Submission Portal.

David Watson, PhD

Editor, Journal of Abnormal Psychology

Department of Psychology

The University of Iowa

Iowa City, IA 52242-1407 Manuscript Submission Portal Entrance

General correspondence may be directed to the Editor's Office.

In addition to postal addresses and telephone numbers, please supply electronic mail addresses and fax numbers, if available, for potential use by the editorial and production offices.

Keep a copy of the manuscript to guard against loss.

Masked Reviews

Masked reviews are optional and must be specifically requested in the cover letter accompanying the submission. For masked reviews, the manuscript must include a separate title page with the authors' names and affiliations, and these ought not to appear anywhere else in the manuscript.

Footnotes that identify the authors must be typed on a separate page.

Make every effort to see that the manuscript itself contains no clues to authors' identities.

Types of Articles

Most of the articles published in the Journal of Abnormal Psychology are reports of original research, but other types of articles are acceptable.

* Short Reports of replications or of failures to replicate previously reported results are given serious consideration.

* Comments on articles published in the journal are also considered.

* Case studies from either a clinical setting or a laboratory will be considered if they raise or illustrate important questions that go beyond the single case and have heuristic value.

* Manuscripts that present or discuss theoretical formulations of psychopathology, or that evaluate competing theoretical formulations on the basis of published data, may also be accepted.

The Journal of Abnormal Psychology publishes articles on basic research and theory in the broad field of abnormal behavior, its determinants, and its correlates.

The following general topics fall within its area of major focus:

1. psychopathology - its etiology, development, symptomatology, and course
2. normal processes in abnormal individuals
3. pathological or atypical features of the behavior of normal persons
4. experimental studies, with human or animal subjects, relating to disordered emotional behavior or pathology
5. sociocultural effects on pathological processes, including the influence of gender and ethnicity
6. tests of hypotheses from psychological theories that relate to abnormal behavior

Thus, studies of patient populations, analyses of abnormal behavior and motivation in terms of modern behavior theories, case histories, and theoretical papers of scholarly substance on deviant personality and emotional abnormality would all fall within the boundaries of the journal's interests.

Each article should represent an addition to knowledge and understanding of abnormal behavior in its etiology, description, or change.

In order to improve the use of journal resources, it has been agreed by the two Editors concerned that the Journal of Abnormal Psychology will not consider articles dealing with diagnosis or treatment of abnormal behavior, and the Journal of Consulting and Clinical Psychology will not consider articles dealing with the etiology or descriptive pathology of abnormal behavior.

Therefore, a study that focuses primarily on treatment efficacy should be submitted to the Journal of Consulting and Clinical Psychology. However, a longitudinal study focusing on developmental influences or origins of abnormal behavior should be submitted to the Journal of Abnormal Psychology.

Articles will be published in five different sections of the Journal: Brief Reports, Regular Articles, Extended Articles, Case Studies, and Commentaries:

* Brief Reports must not exceed 5,000 words in overall length. This limit includes all aspects of the manuscript (title page, abstract, text, references, tables, author notes and footnotes, appendices, figure captions) except figures. Brief Reports also may include a maximum of two figures. For Brief Reports, the length limits are exact and must be strictly followed.

* Regular Articles typically should not exceed 9,000 words in overall length (excluding figures).

* Extended Articles are published within regular issues of the Journal (they are not free-standing) and are reserved for manuscripts that require extended exposition beyond the normal length restrictions of a Regular Article. Typically, Extended Articles will report multiple experiments, multifaceted longitudinal studies, cross-disciplinary investigations, or studies that are extraordinarily complex in terms of methodology or analysis. Any submission that exceeds a total of 12,000 words in length automatically will be considered for publication as an Extended Article.

* Case Studies and Commentaries have the same length requirements as Brief Reports.

Cover Letters

Components of all cover letters will contain the following:

1. the full postal and email address of the corresponding author;
2. the complete telephone and fax numbers of the same;
3. the proposed category under which the manuscript was submitted;
4. a request for masked review, if desired, along with a statement ensuring that the manuscript was prepared in accordance with the guidelines above.

Authors should also specify the overall length of the manuscript (in words) and indicate the number of tables and figures that are included in the manuscript.

APA Journals Manuscript Submission Instructions For All Authors

From http://www.apa.org/journals/authors/all-instructions.html

The following instructions pertain to all journals published by APA and the Educational Publishing Foundation (EPF).

Please also visit the web page for the journal to which you plan to submit your article for submission addresses, journal-specific instructions and exceptions.

Manuscript Preparation

Prepare manuscripts according to the Publication Manual of the American Psychological Association (5th edition). Manuscripts may be copyedited for bias-free language (see Chapter 2 of the Publication Manual).

Double-space all copy. Other formatting instructions, as well as instructions on preparing tables, figures, references, metrics, and abstracts appear in the Manual.

If your manuscript was mask reviewed, please ensure that the final version for production includes a byline and full author note for typesetting. Review APA's Checklist for Manuscript Submission before submitting your article.

Submitting Supplemental Materials

APA can now place supplementary materials online, available via the published article in the PsycARTICLES database. Please see Supplementing Your Article With Online Material for more details.

Abstract and Keywords

All manuscripts must include an abstract containing a maximum of 180 words typed on a separate page. After the abstract, please supply up to five keywords or brief phrases.

References

List references in alphabetical order. Each listed reference should be cited in text, and each text citation should be listed in the References section. Examples of basic reference formats:

Journal Article:

Fullagar, C. (1986). A factor analytic study on the validity of a union commitment scale. Journal of Applied Psychology, 71, 129–136.

Authored Book:

Mitchell, T. R., & Larson, J. R., Jr. (1987). People in organizations: An introduction to organizational behavior (3rd ed.). New York: McGraw-Hill.

Chapter in an Edited Book:

Bjork, R. A. (1989). Retrieval inhibition as an adaptive mechanism in human memory. In H. L. Roediger III & F. I. M. Craik (Eds.), Varieties of memory & consciousness (pp. 309–330). Hillsdale, NJ: Erlbaum.

Figures

Graphics files are welcome if supplied as Tiff, EPS, or PowerPoint files. The minimum line weight for line art is 0.5 point for optimal printing.

When possible, please place symbol legends below the figure instead of to the side.

Original color figures can be printed in color at the editor's and publisher's discretion provided the author agrees to pay

* $255 for one figure
* $425 for two figures
* $575 for three figures
* $675 for four figures
* $55 for each additional figure

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It is a violation of APA Ethical Principles to publish "as original data, data that have been previously published" (Standard 8.13).

In addition, APA Ethical Principles specify that "after research results are published, psychologists do not withhold the data on which their conclusions are based from other competent professionals who seek to verify the substantive claims through reanalysis and who intend to use such data only for that purpose, provided that the confidentiality of the participants can be protected and unless legal rights concerning proprietary data preclude their release" (Standard 8.14).

APA expects authors to adhere to these standards. Specifically, APA expects authors to have their data available throughout the editorial review process and for at least 5 years after the date of publication.

Authors are required to state in writing that they have complied with APA ethical standards in the treatment of their sample, human or animal, or to describe the details of treatment.

*Download Certification of Compliance With APA Ethical Principles Form (PDF: 24KB)

The APA Ethics Office provides the full Ethical Principles of Psychologists and Code of Conduct electronically on their web site in HTML, PDF, and Word format. You may also request a copy by writing to the APA Ethics Office, 750 First Street, NE, Washington, DC 20002-4242 (or see "Ethical Principles," December 1992, American Psychologist, Vol. 47, pp. 1597–1611).

Appendix 6

Ethical and Research Governance Approval Letters

Approval from Ethics Committee (excluded for reasons of confidentiality)

Ethics approval from second site

Research Governance Approval from primary research site

Research Governance Approval from another NHS trust

Appendix 7

Information Sheet and Consent Form

University logo (excluded for confidentiality)

Participant Information Sheet – How mood affects memory

You are being invited to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Talk to others about the study if you wish. The study is a student research project; the lead investigator is a trainee clinical psychologist studying for her doctorate. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

1. What is the purpose of the study?

This study is looking into how mood affects memory. There is a lot of evidence to suggest that the mood a person is in affects what they learn and how they recall that information later. This study aims to look into how this effect might differ in different groups: those with a diagnosis of bipolar disorder and those without any history of mental illness.

2. Why have I been chosen?

You have been invited to participate either because you agreed to go on a list of volunteers for research participants, through an organisation of which you are a member, or directly by the investigator. Half of those participating will have been chosen because they have a diagnosis of bipolar disorder.

3. Do I have to take part?

No. It is up to you to decide whether or not to take part. If you do, you will be given this information sheet to keep and be asked to sign a consent form. You are still free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part, will not affect any healthcare you receive in the future.

4. What will happen to me if I take part?

To start off with, you will be interviewed about your mental health history, then you will be asked to fill in a few brief questionnaires about how you are feeling.[1] The main part of the study will start then. You will watch some video clips. After this some words will be read to you and for each word you will be asked to think of a personal memory triggered by it. You will be asked to memorise some inkblots and two word lists. You will then watch more video clips. After this you will be asked to try to remember what you learned before. After the study you will be able to take your time to wind down.

The study is expected to take approximately an hour and a half. The entire session will be audio-recorded simply for the researcher to check the data are correct. The mental health history interview part of the tape will be heard by two other researchers to ensure that the diagnoses agreed are accurate. The other researchers will not know the identity of the participant, unless you have agreed to carry out their study.

Other studies:

If you are suitable for another student's study you will be asked if you are interested in taking part. If you are interested, your permission will be sought to hand over your mental health history to the other researcher, to save time when you come to do their study. At this time, your name will be passed on to the other researcher with the history

Expenses and payments:

Should you choose to participate in this study, the researcher will get in touch with you to discuss the best place to carry it out. We are unable to make payment for any inconvenience that participating may present, but can be flexible with both the time and location.

6. What are the possible disadvantages and risks of taking part?

This study asks you to talk about personal memories, so as a result you may find yourself talking about emotive or painful things. If you feel too uncomfortable at any time you may withdraw your consent to participate and your data will be destroyed. You also do not have to explain these memories in detail, as the

---

[1] If the researcher has concerns that you are at acute risk, she is obliged to take action by contacting your GP or a duty psychiatrist.

research is really concerned with your view of the personal memories rather than how much of it you remember.

7. What are the possible benefits of taking part?

We cannot promise the study will help you but the information we get may help improve the treatment of people with bipolar disorder. It may give some clues as to how moods escalate into clinical episodes and thus help in treatments that try to manage the predictors of episodes in bipolar disorder.

8. What happens when the research study stops?

Most likely, there will be no change in your care after participating in this study. However, if any of the questionnaires indicated that you are suffering from an acute mental heath problem such as depression you will be advised to seek advice from your GP or mental health specialist, and will not take part in the study.

9. Will my taking part in the study be kept confidential?

Yes. Each participant will be given a number when they take part. This number will be put on all the data for your study and will only be linked with your name on the consent form, which you will have signed. The consent forms will be kept separately to the rest of the data. Tapes will be stored separately from both of these, all in a locked cabinet. Your permission will be sought to hand over your contact details if you consent to take part in another study. Your mental health history results will also be handed over at this point, to save repetition on behalf of the other researcher. In order to check the diagnoses agreed during the interview, the tape of the interview will be played, anonymised, to two other researchers. The procedures for handling, processing, storage and destruction of your data are compliant with the Data Protection Act 1998.

No other parties will have access to view participant identifiable data, although the NHS trust sponsoring the research and other regulatory authorities may look at some of the anonymised data to check that the study is being carried out correctly. Participants also have the right to check the accuracy of data held about them and correct any errors.

10. What if there is a problem?

Complaints:

If you have a concern about any aspect of this study, you should ask to speak with the researchers who will do their best to answer your questions. If you

remain unhappy and wish to complain formally, you can do this through the NHS Complaints Procedure. Details can be obtained from the local hospital.

Harm:

In the event that something does go wrong and you are harmed during the research study there are no special compensation arrangements. If you are harmed and this is due to someone's negligence then you may have grounds for a legal action for compensation against *XX* NHS Trust but you may have to pay your legal costs. The normal National Health Service complaints mechanisms will still be available to you (if appropriate).

11. What if relevant new information becomes available?

If such information becomes available before you participate in the research you will be notified as to whether your participation is still wanted. If the study is stopped for any other reason, you will be told why.

12. What will happen to the results of the research study?

The researcher intends to publish the results of the study and submit them as part of her doctoral portfolio. They will be provided to the participants as a preliminary summary and the research paper itself will also be sent to them. Under no circumstances will any participants be identified in the research paper

13. Who is organising and funding the research?

The *XX* NHS Trust is sponsoring and funding the research.

14. Who has reviewed the study?

This study was given a favourable ethical opinion for conduct in the NHS (or private sector) by the *XX* Research Ethics Committee.

15. Contact Details:

If you would like to ask any concerns or further questions about the study, please contact *Researcher* on *Telephone number* and leave a message. I will ring you back as soon as possible.

Thank you for taking the time to read this sheet. Should you choose to participate, you will be given a copy of this sheet and your consent form to keep.

University logo (excluded for confidentiality)

Participant Number:

CONSENT FORM

Title of Project: Mood and Memory in Bipolar Disorder

Name of Researcher: *Researcher*

Please initial box

1. I confirm that I have read and understand the information sheet dated 11/11/07 (Version 5) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected. ☐

3. I agree to a tape recording of my participation being made and securely stored. ☐

4. I understand that tape recordings, interviews and questionnaires will be kept strictly confidential, only identifiable by a participant number. ☐

5. I understand that relevant sections of any of the data collected during the study may be looked at by responsible individuals from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my data. ☐

6. I understand that if I am suitable for another student's project, I will be asked permission for my details to be passed to them. If I refuse, that will not affect my participation in this study or my medical or legal rights. ☐

If I agree, I understand that my name, contact details and relevant questionnaire scores will be shared with the other researcher.

7. I agree to take part in the above study. ☐

Name of Participant (PRINTED)	Date	Signature
_____	_____	_____
Researcher name (PRINTED)	Date	Signature
_____	_____	_____

When completed: 1 for patient, 1 for researcher site file.

Appendix 8

Non-copyrighted Materials

Mania Rating Scale: MRS (Bech et al., 2002)

1. Activity: Motor
0. Not unusual
1. Slight or doubtfully increased motor activity (e.g. lively facial expression)
2. Moderately increased motor activity (e.g. lively gestures)
3. Clearly excessive motor activity, on the move most of the time, rises once or several times during interview
4. Constantly active, restlessly energetic. Even if urged, the patient cannot sit still.

2. Activity: Verbal
0. Not unusual
1. Somewhat talkative
2. Very talkative, no spontaneous intervals in the conversation.
3. Difficult to interrupt.
4. Impossible to interrupt, completely dominates the conversation.

3. Flight of Thoughts
0. Not present
1. Somewhat lively descriptions, explanation and elaborations without losing the connection with the topic of the conversation. The thoughts are thus still cohesive.
2. Very talkative, no spontaneous intervals in the conversation.
3. Difficult to interrupt.
4. Impossible to interrupt, completely dominates the conversation.

4. Voice/Noise Level
0. Not unusual
1. Speaks somewhat loudly without being noisy
2. Voice discernible at a distance, and somewhat noisy.
3. Vociferous, voice discernible at a long distance, is noisy, singing.
4. Shouting, screaming; or using other sources of noise due to hoarseness.

5. Hostility/Destructiveness
0. No signs of impatience or hostility.
1. Somewhat irritable or hostile, but control is maintained.
2. Markedly impatient or irritable, but control is maintained.
3. Provocative, makes threats, but can be calmed down.
4. Overt physical violence; physically destructive.

6. Mood Level (Feeling of Well-Being)
0. Not unusual
1. Slightly or doubtfully elevated mood, optimistic, but still adapted to situation.
2. Moderately elevated mood, joking, laughing.
3. Markedly elevated mood, exuberant both in manner and speech.
4. Extremely elevated mood, quite irrelevant to situation.

7. Self-Esteem
0. Not unusual
1. Slightly or doubtfully increased self-esteem, for example occasionally over-estimates his own habitual capacities
2. Moderately increased self-esteem, for example, over-estimates more constantly his own habitual capacities or hints at unusual abilities.
3. Markedly unrealistic ideas, for example, that he has extraordinary abilities, powers or knowledge (scientific, religious, etc.), but can briefly be corrected.
4. Grandiose ideas that cannot be corrected.

8. Contact (Intrusiveness)

0. Not unusual
1. Slightly or doubtfully meddling, for example, interrupting or slightly instrusive.
2. Moderately meddling and arguing or intrusive.
3. Dominating, arranging, directing, but still in the context with the setting.
4. Extremely dominating and manipulating, not in context with the setting.

9. Sleep (Average of past 3 nights)

0. Habitual duration of sleep.
1. Duration of sleep reduced by 25%
2. Duration of sleep reduced by 50%
3. Duration of sleep reduced by 75%
4. No sleep.

10. Sexual Interest

0. Habitual sexual interest or activity.
1. Slight or doubtful increase in sexual interest and activity, for example, slightly flirtatious.
2. Moderate increase in sexual interest and activity, for example, clearly flirtatious.
3. Marked increase in sexual interest and activity; excessively flirtatious; dress provocative.
4. Completely and inadequately occupied by sexuality.

11. Decreased Work Ability

A At first rating

0. Not present
1. Slightly or doubtfully increased drive, but work quality is slightly down as motivation in changing, and the patient somewhat distractible.
2. Increased drive, but motivation clearly fluctuating. The patient has difficulties in judging his own work quality and quality is indeed lowered. Frequent quarrels at work.
3. Work capacity is clearly reduced; the patient occasionally loses control. He must stop work and be written off sick. If hospitalised, he can participate for some hours per day in ward activities.
4. The patient is (or ought to be) hospitalised and is unable to participate in ward activities.

B At weekly ratings

0. (a) The patient has resumed work at his normal activity level.
   (b) The patient would have no trouble in working, but the effort is somewhat reduced due to changeable motivation.
1. (a) The patient is working, but the effort is somewhat reduced due to changeable motivation.
   (b) It is doubtful whether the patient can resume normal work on a full scale due to distractibility and changeable motivation.
2. (a) The patient is working, but at a clearly reduced level, for example, due to episodes of non-attendance
   (b) The patient is still hospitalised or written off sick. He is able to resume work only if special precautions are taken: close supervision and/or reduced working hours.
3. The patient is still hospitalised or written off sick and is unable to resume work. In hospital he participates for some hours per day in ward activities.
4. The patient is still fully hospitalised and generally unable to participate in ward activities.

MRS – Assessment Sheet

Patient Name: Date:

	SCORE
1. Activity – motor	
2. Activity – verbal	
3. Flights of idea	
4. Voice/Noise level	
5. Hostility/Destructiveness	
6. Mood level (feeling of well being)	
7. Self-esteem	
8. Contact (intrusiveness)	
9. Sleep (average of last 3 nights)	
10. Sexual interest	
11. Decreased work ability (first/weekly rating)	

MRS – Score interpretation guide

0 – 5	No mania
6 – 9	Hypomania (mild)
10 – 14	Probably mania
15 +	Definite mania

SHPSS (Usual)

Name_____

Date_____

Please rate how well the following words describe **the way you are most of the time**, by circling the most appropriate number on the scale.

1.	Confident	Not at all					Extremely
		1	2	3	4	5	6
2.	Dynamic	Not at all					Extremely
		1	2	3	4	5	6
3.	Adorable	Not at all					Extremely
		1	2	3	4	5	6
4.	Entertaining	Not at all					Extremely
		1	2	3	4	5	6
5.	Outgoing	Not at all					Extremely
		1	2	3	4	5	6
6.	Optimistic	Not at all					Extremely
		1	2	3	4	5	6
7.	Creative	Not at all					Extremely
		1	2	3	4	5	6

SHPSS (Ideal)

Name_____

Date_____

Please rate how well the following words describe **how you would ideally like to be**, by circling the most appropriate number on the scale.

1.	Confident	Not at all					Extremely
		1	2	3	4	5	6
2.	Dynamic	Not at all					Extremely
		1	2	3	4	5	6
3.	Adorable	Not at all					Extremely
		1	2	3	4	5	6
4.	Entertaining	Not at all					Extremely
		1	2	3	4	5	6
5.	Outgoing	Not at all					Extremely
		1	2	3	4	5	6
6.	Optimistic	Not at all					Extremely
		1	2	3	4	5	6
7.	Creative	Not at all					Extremely
		1	2	3	4	5	6

Visual Analogue Scale (VAS)

I----------I----------I

Saddest ever felt | I've | Neutral | Happiest I've ever felt

Ratings for Pleasantness, Emotional Intensity, Personal Importance and Vividness

1 How pleasant is this memory from 1 (very unpleasant) to 5 (very pleasant)

I----------I----------I----------I----------I

1 2 3 4 5

How intense is your emotions, from 1 (not at all intense) to 5 (extremely intense)

I----------I----------I----------I----------I

1 2 3 4 5

How personally important does the even seem, from 1 (unimportant) to 5 (very important)

I----------I----------I----------I----------I

1 2 3 4 5

How vivid is your recollection of this memory on a scale of 1 (very faint) to 5 (feels like I'm there)

I----------I----------I----------I----------I

1 2 3 4 5

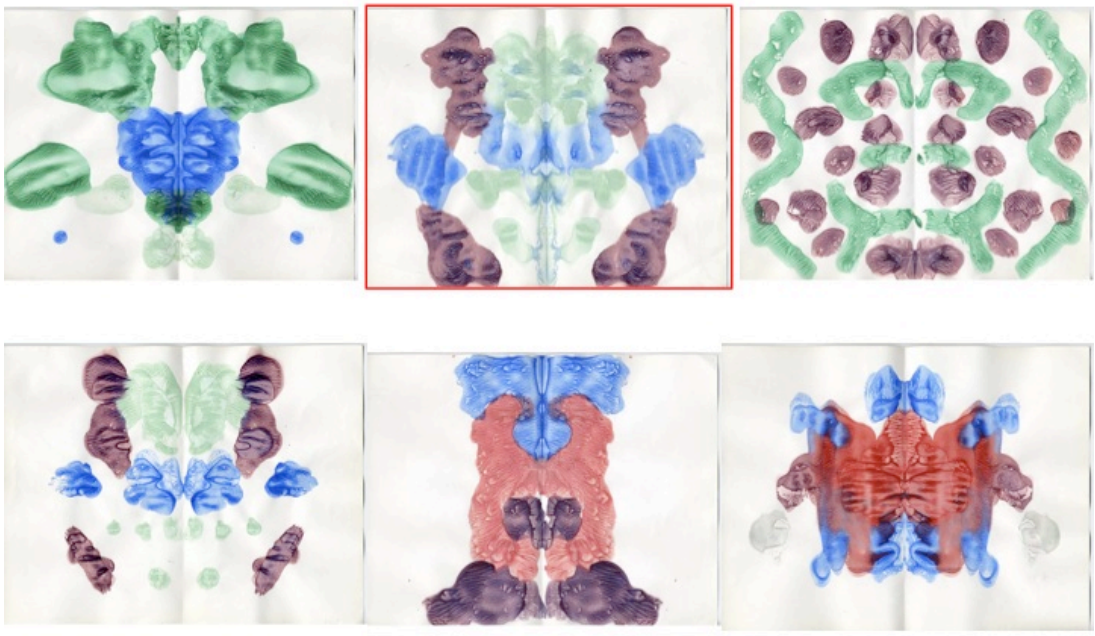
Ratings Against the Words from the SHPSS

Confident	I----------I----------I----------I 0 1 2 3
Dynamic	I----------I----------I----------I 0 1 2 3
Adorable	I----------I----------I----------I 0 1 2 3
Entertaining	I----------I----------I----------I 0 1 2 3
Outgoing	I----------I----------I----------I 0 1 2 3
Optimistic	I----------I----------I----------I 0 1 2 3
Creative	I----------I----------I----------I 0 1 2 3

Inkblots

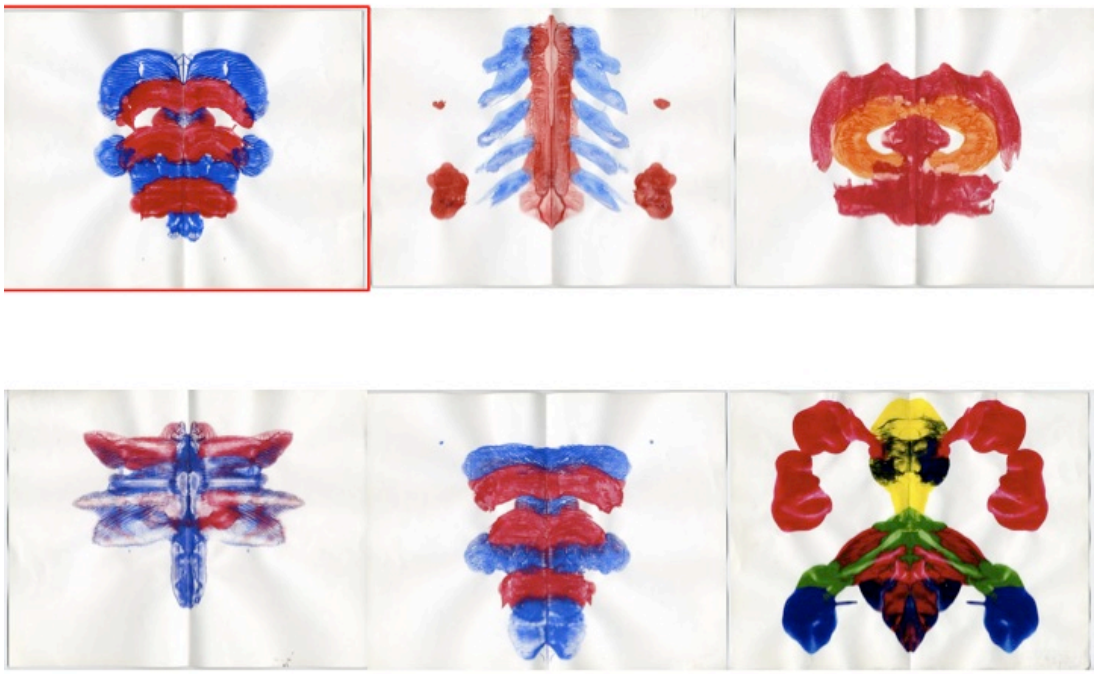
This shows the recognition task using the Inkblots from Eich et al. (1997). The target inkblots are outlined in red.

Item One

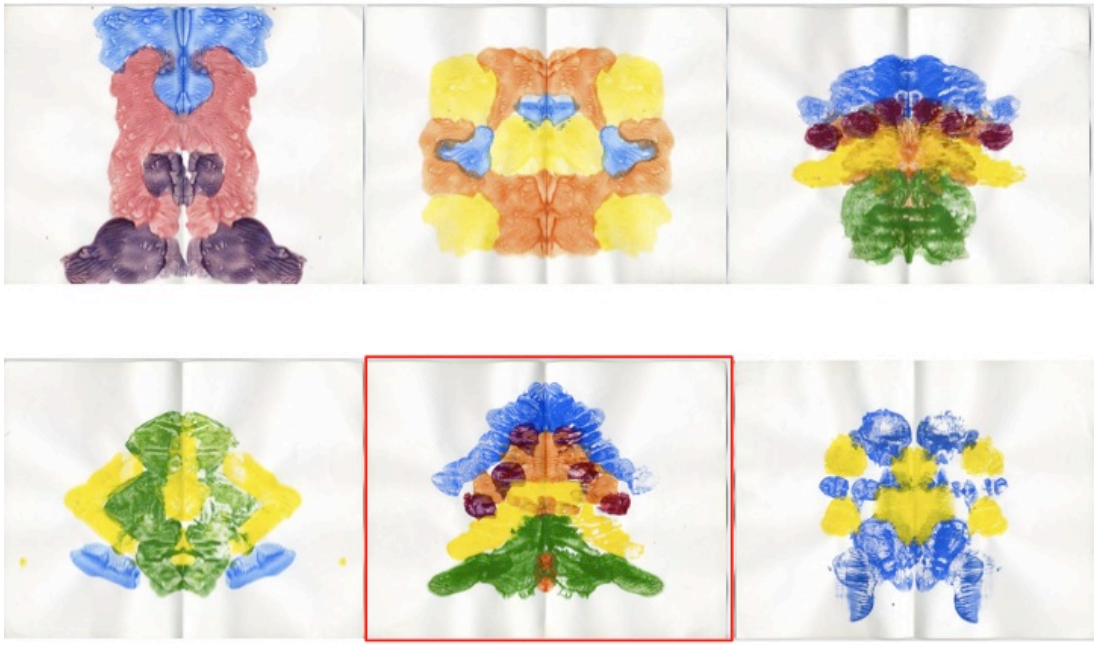


Item Two

Item Three



Item Four



Appendix 9

Further Information about Statistical Analyses

Group Differences on Demographic Variables

Employment status: recoded into "employed or not" and compared across control and clinical groups.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.036[a]	1	.849		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.036	1	.849		
Fisher's Exact Test				1.000	.534
Linear-by-Linear Association	.036	1	.850		
N of Valid Cases	58				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.66.

b. Computed only for a 2x2 table

Marital status: recoded into "married or not" and compared across clinical and control groups.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7.447[a]	1	.006		
Continuity Correction[b]	5.782	1	.016		
Likelihood Ratio	7.944	1	.005		
Fisher's Exact Test				.009	.007
Linear-by-Linear Association	7.319	1	.007		
N of Valid Cases	58				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.79.

b. Computed only for a 2x2 table

Age:

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means					
AGE							95% Confidence Interval of the Difference	
	F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.405	.527	1.033	56	.306	3.017	2.920	-2.833	8.867
Equal variances not assumed			1.036	55.969	.304	3.017	2.911	-2.814	8.848

Sex:

Chi-Square Tests

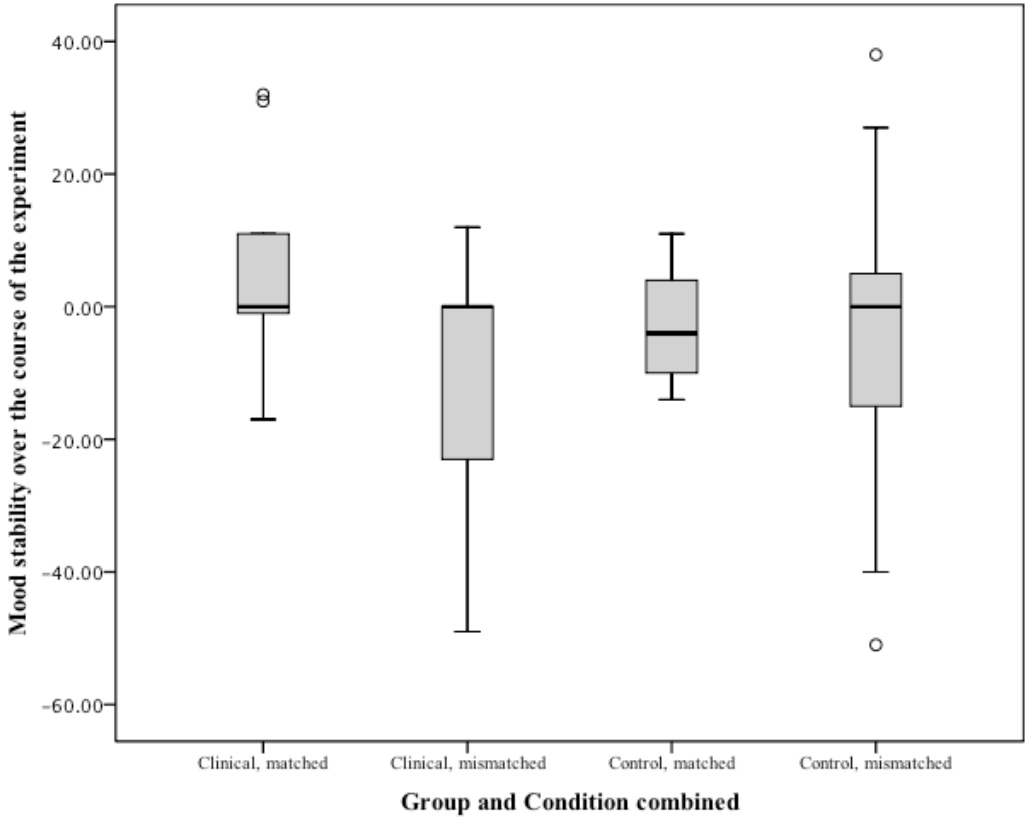
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.056[a]	1	.813		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	.056	1	.813		
Fisher's Exact Test				1.000	.511
Linear-by-Linear Association	.055	1	.814		
N of Valid Cases	58				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.55.

b. Computed only for a 2x2 table

Mood Stability over the Course of the Experiment

A stem-and-leaf plot showing mood change over course of experiment across the four groups.



Mood Dependent Memory: Ordinal Regressions

Autobiographical memory recall with the interaction in the model:

Parameter Estimates

							95% Confidence Interval	
		Estimate	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Threshold	[recodedabmemnocue = 2.00]	-2.387	4.781	.249	1	.618	-11.758	6.984
	[recodedabmemnocue = 3.00]	-1.267	4.770	.070	1	.791	-10.616	8.083
	[recodedabmemnocue = 4.00]	.482	4.764	.010	1	.919	-8.855	9.818
	[recodedabmemnocue = 5.00]	2.063	4.775	.187	1	.666	-7.295	11.421
Location	[Group=1.00]	-.924	.725	1.622	1	.203	-2.345	.498
	[Group=2.00]	0[a]	.	.	0	.	.	.
	[Condition=1]	.040	.678	.004	1	.952	-1.289	1.370
	[Condition=2]	0[a]	.	.	0	.	.	.
	FSIQ	-.013	.041	.099	1	.753	-.094	.068
	Memory ability	.199	.090	4.855	1	.028	.022	.376
	BDI	-.098	.065	2.302	1	.129	-.225	.029
	[Group=1.00] * [Condition=1]	.655	1.017	.415	1	.519	-1.338	2.648
	[Group=1.00] * [Condition=2]	0[a]	.	.	0	.	.	.
	[Group=2.00] * [Condition=1]	0[a]	.	.	0	.	.	.
	[Group=2.00] * [Condition=2]	0[a]	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Autobiographical memory recall without the interaction in the model:

Parameter Estimates

							95% Confidence Interval	
		Estimate	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Threshold	[recodedabmemnocue = 2.00]	-2.947	4.747	.386	1	.535	-12.251	6.356
	[recodedabmemnocue = 3.00]	-1.840	4.734	.151	1	.697	-11.118	7.437
	[recodedabmemnocue = 4.00]	-.104	4.725	.000	1	.982	-9.365	9.157
	[recodedabmemnocue = 5.00]	1.472	4.734	.097	1	.756	-7.805	10.750
Location	[Group=1.00]	-.659	.601	1.201	1	.273	-1.838	.520
	[Group=2.00]	0[a]	.	.	0	.	.	.
	[Condition=1]	.336	.483	.485	1	.486	-.610	1.283
	[Condition=2]	0[a]	.	.	0	.	.	.
	FSIQ	-.020	.041	.232	1	.630	-.099	.060
	Memory ability	.202	.089	5.102	1	.024	.027	.377
	BDI	-.088	.062	2.029	1	.154	-.210	.033

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Inkblot recognition with the interaction in the model:

Parameter Estimates

							95% Confidence Interval	
		Estimate	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Threshold	[Inkblots = 1.0]	-2.119	4.773	.197	1	.657	-11.474	7.236
	[Inkblots = 2.0]	-.419	4.761	.008	1	.930	-9.751	8.912
	[Inkblots = 3.0]	.924	4.762	.038	1	.846	-8.410	10.257
Location	[Group=1.00]	-.361	.718	.253	1	.615	-1.768	1.046
	[Group=2.00]	0[a]	.	.	0	.	.	.
	[Condition=1]	-.593	.681	.758	1	.384	-1.928	.742
	[Condition=2]	0[a]	.	.	0	.	.	.
	FSIQ	-.013	.041	.098	1	.754	-.094	.068
	Memory ability	.154	.089	3.001	1	.083	-.020	.328
	BDI	-.058	.064	.832	1	.362	-.183	.067
	[Group=1.00] * [Condition=1]	1.772	1.034	2.940	1	.086	-.254	3.798
	[Group=1.00] * [Condition=2]	0[a]	.	.	0	.	.	.
	[Group=2.00] * [Condition=1]	0[a]	.	.	0	.	.	.
	[Group=2.00] * [Condition=2]	0[a]	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Inkblot recognition without the interaction in the model:

Parameter Estimates

							95% Confidence Interval	
		Estimate	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Threshold	[Inkblots = 1.0]	-2.311	4.713	.241	1	.624	-11.548	6.926
	[Inkblots = 2.0]	-.701	4.702	.022	1	.882	-9.916	8.514
	[Inkblots = 3.0]	.577	4.702	.015	1	.902	-8.639	9.792
Location	[Group=1.00]	.386	.597	.419	1	.518	-.783	1.555
	[Group=2.00]	0[a]	.	.	0	.	.	.
	[Condition=1]	.259	.481	.290	1	.590	-.683	1.202
	[Condition=2]	0[a]	.	.	0	.	.	.
	FSIQ	-.019	.040	.232	1	.630	-.099	.060
	Memory ability	.156	.088	3.171	1	.075	-.016	.328
	BDI	-.034	.061	.315	1	.575	-.154	.085

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Mood-Congruent Judgment

SHPSS ratings: Anova tables

Tests of Between-Subjects Effects

Dependent Variable: First SHPSS change with interaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1128.930[a]	4	282.232	2.112	.092
Intercept	40.838	1	40.838	.306	.583
Group	84.147	1	84.147	.630	.431
Condition	624.415	1	624.415	4.672	.035
BDI	.522	1	.522	.004	.950
Group * Condition	272.801	1	272.801	2.041	.159
Error	7083.615	53	133.653		
Total	8380.311	58			
Corrected Total	8212.545	57			

a. R Squared = .137 (Adjusted R Squared = .072)

Tests of Between-Subjects Effects

Dependent Variable: First SHPSS change without interaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	856.129[a]	3	285.376	2.095	.112
Intercept	13.946	1	13.946	.102	.750
Group	149.912	1	149.912	1.100	.299
Condition	668.740	1	668.740	4.909	.031
BDI	12.827	1	12.827	.094	.760
Error	7356.417	54	136.230		
Total	8380.311	58			
Corrected Total	8212.545	57			

a. R Squared = .104 (Adjusted R Squared = .054)

Tests of Between-Subjects Effects

Dependent Variable: Second SHPSS change with interaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	474.872[a]	4	118.718	.879	.483
Intercept	39.466	1	39.466	.292	.591
Group	45.751	1	45.751	.339	.563
Condition	313.572	1	313.572	2.322	.133
BDI	.000	1	.000	.000	.999
Group * Condition	58.077	1	58.077	.430	.515
Error	7155.904	53	135.017		
Total	7787.316	58			
Corrected Total	7630.776	57			

a. R Squared = .062 (Adjusted R Squared = -.009)

Tests of Between-Subjects Effects

Dependent Variable: Second SHPSS change without interaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	416.795[a]	3	138.932	1.040	.382
Intercept	26.034	1	26.034	.195	.661
Group	67.573	1	67.573	.506	.480
Condition	328.267	1	328.267	2.457	.123
BDI	4.076	1	4.076	.031	.862
Error	7213.981	54	133.592		
Total	7787.316	58			
Corrected Total	7630.776	57			

a. R Squared = .055 (Adjusted R Squared = .002)

Appendix 10

Reflective Statement

I thought it would be useful to take a chronological approach to the research process in this statement. I will therefore describe the transformation from the first seeds of ideas to these last few weeks, reflecting on my feelings and the difficulties encountered at various stages. The reflection will also consider theoretical thoughts, ethical issues and rationale for journal choice.

The First Two Years

When research ideas were being considered, I had a few ideas about what might interest me. I was interested in homelessness, but also had a background in memory research and psychological interventions in bipolar disorder from my undergraduate degree. When Dominic Lam joined the department, my interest in bipolar disorder was stimulated, and I also wanted to stay in quantitative methodology. I therefore approached Dominic as a supervisor. He highlighted Eric Eich's research and I was interested so we designed a paradigm and I managed to get through ethics quite early last year (April 2007).

I felt quite on top of things regarding progress, although it was always daunting to imagine creating a "thesis". However, I think my nervousness and indecision about various elements of the research meant I did not pay sufficient attention to the specifics over the summer of 2007. I worked quite hard at it, painstakingly recreating new film clips and mood induction collections using the same films as used in previous research but to a higher quality. This was a useful line of work, but it was difficult to show how the clips had taken up so much of my

time, and concentrating on this left other elements unconsidered. It also meant that I did not see my first participants until November. I had been advised to start collecting data well in advance of this, and I now see it would have been wise to do so.

I felt a lot of avoidance about telephoning potential participants. Being unable to pay them meant it felt like asking them to give up their time for nothing in return, and I am still amazed at how many people were willing to get involved at no personal gain. This avoidance was worsened when, in December, my laptop was stolen, the only place the video clips had been stored due to their large size. This event, and other events in my personal life, made it hard for me to keep the pressure on recruitment. I spent the Christmas break recreating the film clips; luckily it didn't take as long as the first time because I had learnt from my mistakes.

January 2008 brought a wake-up call: I had only seen four clinical participants and no controls. I realised that I needed to turn my attention to recruitment urgently. This is one area that I feel has developed: I have learnt to feel my wish to avoid that difficult telephone conversation and to make the call anyway. I rapidly booked in the majority of my clinical participants and managed to recruit similar age controls from my acquaintances.

Since that wake-up, I feel that the pressure has not really lessened. The literature review element has felt like a long battle in exploring the literature, balancing the usefulness to me, considering the clinical relevance and how new the information is to the field.

Thoughts About the Literature Review

In the end, I am pleased that I chose the Affect Infusion Model (AIM; Forgas, 1995) for review. It gave me an opportunity to explore the wider literature about mood and judgments or decision-making, which is interesting as well as thought provoking. I genuinely think that linking this area with clinical populations is extremely useful. I spent a long time trying to slot together ideas such as the hierarchical search model of overgeneral memory (Williams et al. 2007), Bower's associative network theory (1981) and neuropsychological research, which felt confusing and overwhelming. I always feel that psychology has tried to help itself by breaking the brain up into smaller bits, functions or locations, but ultimately it means researchers talking about similar things in different journals using different language. A case in point is the AIM: surely the fundamental starting point of any theory of mood effects on cognition should be theories of emotion, but the AIM concentrates on the valence of an emotion without reference to how theoretically relevant this is. It seems that researchers can become concentrated on explaining specific (and therefore limited) phenomena (such as valence) without looking at the wider context.

Taking a clinical psychologist's look at the two articles, I think about avoidant attachment, and how this term fits into the constructs described in them. Considering the manic defence hypothesis too, I feel there is a need to take the umbrella view of the literature. This has always been my wish, to be able to consider

the bigger picture, although it may be seen from the articles that I have struggled to do so.

Part of that is to do with time to read and write up the dizzying amount of literature. Perhaps it is also because there is a culture of playing along with this in psychology, each researcher following his or her own path competitively rather than collaboratively.

Ethical Issues and Difficult Feelings

The above reflections have been plaguing me, but regarding the empirical research, other concerns have arisen. Recruiting and seeing clinical participants has not been easy, as I am sure it never is. I struggled initially with sending participants away who were, on meeting with them, not suitable due to high depression or mania scores. I felt concerned about the trouble they made in getting to the appointment, only to be sent away. These concerns were dealt with mainly through peer support. Being able to share difficult times and decisions has been crucial. It is hard to imagine coping without this support. Research in this context essentially feels like taking and not giving anything back. I began making cakes for participants to help swing the balance a bit, but as time became scarcer, this was lost.

Related to this feeling of taking is the problem of the negative mood induction. I felt great guilt inducing negative mood in participants. There were individuals in both groups noticeably affected by the film clips: in fact, subjectively more in the control group. As I have explained in the paper, I made efforts to repair mood following this, but I hardly lost the reluctance to subject people to it as time went on.

Another ethical dilemma with the research was the use of the SCID. Clinically, I am not familiar with using diagnostic categories rigidly, and in fact have quite strong opinions about the validity of some diagnoses. Bipolar disorder is not one of these, although I am more cynical about it now than I was. It was sometimes difficult to categorise participants meaningfully and I was left with the feeling that I was not telling the whole story. On the other hand, I suspect the intention of the SCID is not to tell the whole story, but to provide a structure for the story. However, using it in this way feels quite invalidating and curt. The first few interviews took about two hours as I used clinical interviewing techniques to help participants tell their story. I rapidly realised this was not feasible as a long-term strategy. Ultimately, I adopted an efficient style which served me more faithfully but which felt unfamiliar and uncomfortable.

Journal Choice

This section fits uncomfortably into the reflective approach of the statement. However, it is important that I justify my choices.

Cognition and Emotion has just begun publishing reviews: in fact, they are so unfamiliar with publishing them that I have been unable to obtain a word count limit, even speaking to the editorial assistant. However, it is clearly the most appropriate journal for a review paper examining the Affect Infusion Model. It is a reputable journal, albeit with a modest impact factor (1.767; 2001 figure from library.cmu.ac.th/db_pdf/JIF/jif2001_st.pdf). Many of the papers I have reviewed are from this journal. The journal description writes, "[suitable topics include] the impact of emotion on attention, memory, learning, motivation, judgements, and

decisions; the interplay between cognition and emotion in psychopathology, social behaviour" (from www.tandf.co.uk/journals/pp/02699931.html). The decision was thus based on the suitability of the article for the journal rather than the impact factor alone.

The Journal of Abnormal Psychology is a well renowned journal (impact factor 2.566; same source as previously) whose intended content clearly encompasses the topic of the empirical paper. To quote the journal description as before, "Readers will find research in psychopathology, normal processes in abnormal individuals, and pathological or atypical features of the behavior [*sic*] of normal persons" (from www.apa.org/journals/abn/description.html). The empirical paper is particularly relevant for the "normal processes in abnormal individuals" part of that description. The investigation of mood effects on memory is found in both clinical and non-clinical participants, but in my searches, I have not found a study that directly compares the phenomena in the two groups, making it a useful addition to the literature.

The Last Few Weeks

These have been stressful. I feel emotionally dysregulated. I go from feeling relieved and confident to feeling as if the rug has been pulled from under my feet. I am confronting perfectionist daemons I wasn't previously aware of. Writing my thesis, I have realised that I am likely to be more aware of weaknesses in the research than observers, just as I am more likely to notice when I look tired. It has felt true to say at times, "Familiarity breeds contempt".

I am concentrating on the support of Dominic and of my peers and that my work is good enough and that 'good enough' is what I am aiming for, not perfect. However, this process of self-doubt and frustration mean that when I hand my work over I feel proud of myself. I am, as yet, too close to the work itself to feel proud of it, but I will value the effort I have put in, the hours of work and my proven ability to conquer my fears and avoidance. I feel that there is a risk of labelling the final year of the clinical psychology doctorate the most stressful of my life and of locking it tightly away. However, if I can hold on to this discomfort, I hope I may see what I have done as an achievement to look to at future times of self-doubt.