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**On the regulatory functions of mood:
Affective influences on memory, judgments and behavior**

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Abstract

This chapter reviews traditional and current psychological theories linking affect to social thinking and behavior. It is suggested that affective states perform an important regulatory function, triggering more or less assimilative or accommodative processing strategies producing adaptive responses in various cognitive and social responses. A variety of empirical studies are presented, demonstrating the regulatory consequences of affect in tasks such as memory performance, judgments, inferences, the detection of deception, social perception, interpersonal communication and strategic interactions. These results will be interpreted in terms of a dual-process theory that predicts that negative affect promotes a more accommodative, vigilant, and externally focused thinking strategy and positive affect triggers more internally driven, assimilative processing. The relevance of these findings for recent affect-cognition theories will be discussed, and the practical implications of exploring the regulatory consequences of affect in a number of applied fields will be considered.

1. Introduction

As even a cursory inspection of our fellow human beings will confirm, ours is a remarkably moody species. Almost everything we think and do throughout the day is colored by the fluctuating mood states that accompany us. Mostly, moods appear to be a mere disturbance and a source of distraction. Positive moods are obviously pleasant, and negative moods seem troubling, but beyond their hedonic influence, do moods play any regulatory role in guiding our reactions to the manifold challenges of everyday life? Even though affect is a powerful phenomenon in social life, the functions of affective states and their influence on thinking and behaviour remain imperfectly understood (Forgas, 1995a, 2002; Forgas & Eich, in press). Despite centuries of interest, the relationship between feeling and thinking, affect and cognition remains one of the great puzzles about human nature.

It is generally assumed that positive affect is always desirable, and even a short visit to any bookshop will confirm that advice on how to be more happy, more contented and more satisfied more of the time is in great demand. Within psychology, movements such as 'positive psychology' seek to promote happiness as a cure for many of our individual and societal ills. However, within an evolutionary framework (Forgas, Haselton & von Hippel, 2007), we should at least entertain the possibility that all affective states, however mild or sub conscious, could serve an adaptive regulatory function. In a sense, moods may operate like functional 'mind modules' that are spontaneously triggered by various environmental challenges, and in turn spontaneously recruit response strategies appropriate to the situation (Forgas et al., 2007; Frijda, 1986; Tooby & Cosmides, 1992). There is already good evidence that affective states do perform an important regulatory role in providing feedback about the progress towards achieving desired goals (Carver & Scheier, 19??).

It is the influence of mild, everyday positive moods rather than more intense and distinct emotions that will be of interest here, as moods are more common, more enduring and typically produce more uniform and reliable cognitive and behavioral consequences than do more context-specific emotions (Forgas, 2002, 2006). We may define moods as low-intensity, diffuse and relatively enduring affective states without a salient antecedent cause and therefore little conscious cognitive content. In contrast, emotions are more intense, short-lived and usually have a definite cause and conscious cognitive content (Forgas, 1995, 2002). In addition to serving as specific feedback signals (see Carver & Scheier, 19??), this chapter will argue that moods also have a more general and universal regulatory function. We will survey a range of

experimental studies providing convergent, and somewhat counterintuitive evidence demonstrating the often useful and adaptive regulatory consequences of mild positive and negative affective states in the performance of cognitive, judgmental, motivational and interpersonal tasks. The chapter begins with a brief review of theoretical approaches linking affect, motivation and cognition. We will then review a number of experiments demonstrating the regulatory effects of positive and negative affective states for cognition, motivation and interpersonal behavior. The role of different information processing strategies in mediating these effects will receive special attention.

1.1 Affect and mood: Hedonistic experience and regulatory functions

It is interesting to consider that even though the search for positive affect and happiness seems a universal human characteristic, our affective repertoire as a species nevertheless remains heavily skewed towards the unpleasant, negative emotions and most of our basic emotions are negative - fear, anger, disgust and sadness. Why should this be so? There is good evidence that fear, anger and disgust were clearly adaptive in our ancestral environment, preparing the organism for flight (fear), fight (anger) or avoidance (disgust). But what can we say about sadness, perhaps the most ubiquitous of our negative affective states? Although sadness is very common, and it is dealing with sadness that keeps the majority of applied psychology professionals in business, its possible adaptive functions remain puzzling and poorly understood (Ciarrochi, Forgas & Mayer, 2006). In our culture negative affect is also often considered as unnecessary and undesirable. In contrast, sadness and melancholia have been accepted as normal in most previous historical epochs (Sedikides, Wildschut, Arndt & Routledge, 2006).

From the classic philosophers through Shakespeare to the works of Chekhov, Ibsen and the great novels of the 19th century, exploring the landscape of sadness, longing and melancholia has long been considered instructive, and indeed ennobling. Many of the greatest achievements of the human mind and spirit were borne out of sadness, dysphoria and even enduring depression. Most of the classic works of Western culture and civilization deal with the evocation and cultivation of negative feelings and emotions. There are more Greek tragedies than there are comedies, Shakespeare also wrote more numerous tragedies than comedies, and hilarity generally comes a distant second to seriousness in most great literature and art. It seems that dealing with negative affect and what it tells us about the human condition has long been the focus of many artists and writers. It is only in the last few decades that a major industry

promoting the cult of positivity has emerged, and replaced the earlier and more balanced view of the landscape of human affectivity.

This chapter will present a conceptual argument, and extensive research indicating that in many everyday situations both negative and positive mood perform an important regulatory function, automatically triggering information processing strategies that are adaptive in a given situation. The basic idea here is that we need a variety of information processing styles to respond effectively to the various challenges we face in everyday life. Affective states can perform such a regulatory function by operating like domain-specific adaptations, spontaneously and automatically fine-tuning the way we deal with external and internal information (Forgas, Haselton & von Hippel, 2007; Tooby & Cosmides, 1992). This view is also consistent with recent advances in physiology and neuro-anatomy, confirming that affect is often an essential and adaptive component of responding adaptively to social situations (Adolphs & Damasio, 2001; Ito & Cacioppo, 2001; Forgas, 1995a, 2002; Zajonc, 2000). While some tasks can be better solved when in a positive affective state, other tasks are more amenable to the kind of motivational and cognitive strategies recruited by negative affect (Forgas, 1994, 1998, 2002; Forgas & George, 2001; Forgas & Eich, in press). This prediction is consistent with evolutionary, functionalist approaches of affect that argue that affective states "exist for the sake of signalling states of the world that have to be responded to" (Frijda, 1988, p. 354).

1.2 Linking affect to cognition and behavior

Contemporary theories suggest that affective states may influence cognition and behavior in at least two fundamental ways. *Informational effects* (such as affect congruence) occur when an affective state directly influences the valence and content of cognition and behaviour, selectively promoting the access and use of affect-congruent constructs and ideas (Forgas, 1995).

However, affective states can influence not only the quality and valence of mental contents (Bower, 1981; Clore & Schwarz, 1983), but also have a puzzling effect on *how* people think, the *process* of cognition (Clark & Isen, 1982; Fiedler & Forgas, 1988; Forgas, 2002). Such processing effects occur when an affective state influences the information processing style people adopt when dealing with a particular situation. It is this second kind of effect, affective influences on processing styles that can be considered regulatory in character.

Early theories suggested that positive mood simply leads to more lazy and less *effortful* processing (Clark & Isen, 1982; Sinclair & Mark, 1992), while negative mood promotes effortful and vigilant processing (Schwarz, 1990; Schwarz & Bless, 1991). These mood-induced processing differences were initially explained in motivational terms, suggesting that happy people seek to preserve their good mood by avoiding cognitive effort (mood maintenance), and dysphoric individuals increase effort to improve their mood (mood repair) (Clark & Isen, 1982).

Subsequently, explanations of such processing effects emphasized *functional principles*, suggesting that affective states perform a signalling function, indicating the degree of effort and vigilance that is required in more or less demanding situations. Thus, positive affect signals a familiar, non-threatening situation that requires little vigilance, but negative affect functions as an alarm signal, recruiting a more effortful and vigilant processing style (Schwarz, 1990). This ‘cognitive tuning’ account foreshadowed the possibility that affective states perform an important regulatory function, but there still remained some questions about the nature of the processing differences triggered by different moods. More recent theories, such as Förster & Dannenberg's (2010) global – local processing model suggest that positive affect promotes a more global thinking style, focusing on abstract, high-level features, and negative mood promotes a more local processing style focusing on specifics and details. In a somewhat similar framework, Fredrickson's (2001) broaden-and-build theory also proposes that positive affect tends to broaden and expand, and negative affect tends to narrow and focus one's attention.

1.3 Assimilation versus accommodation.

Probably the most comprehensive current explanation for these regulatory processing effects best able to account for the available evidence was developed by Bless and Fiedler (2006). These authors suggest that rather than simply influencing processing effort, different moods perform an evolutionary regulatory function and actually recruiting qualitatively different processing *styles*. The model adapts Piaget's distinction between *assimilative* and *accommodative* processing styles, and suggests that negative moods call for *accommodative*, bottom-up processing, a style of thinking that focuses on the details of the external world and new stimulus information. In contrast, positive moods recruit *assimilative*, *top-down* processing and greater reliance on existing schematic knowledge and heuristics (Bless, 2000; Bless & Fiedler, 2006; Fiedler, 2001).

This affectively induced regulatory *assimilative / accommodative processing dichotomy* has received extensive support in recent years suggesting that moods perform an adaptive function

preparing us to respond to different environmental challenges. Several studies suggest that such a processing dichotomy associated with good and bad moods can have significant cognitive and behavioral consequences. For example, Fiedler et al. (1991) found that people experiencing a positive mood were more likely to engage in constructive processing and were more influenced by prior priming manipulations, and Koch and Forgas (in press) report that cognitive fluency effects are accentuated by positive mood. Further, negative affect, by facilitating the processing of new external information, can also reduce judgmental mistakes such as the fundamental attribution error (Forgas, 1998), improve the quality and efficacy of persuasive arguments (Forgas, 2007), and also improve eyewitness memory (Fiedler et al., 1991; Forgas et al., 2005), as we shall show later.

The theory thus implies that *both* positive and negative mood can perform a regulatory function and produce processing advantages albeit in response to different situations that require different strategies. In particular, this way of looking at the cognitive consequences of affective states can go some way towards explaining the continuing prevalence of negative moods despite our best efforts to eliminate them: negative affect persists because it continues to fulfil an important and adaptive regulatory function.

We shall now turn to review a range of empirical studies demonstrating the regulatory functions of positive and negative mood on the performance of a variety of cognitive, judgmental, motivational and behavioural tasks. These experiments typically employ a two-stage procedure, as participants are first induced to experience an affective state (for example, using exposure to happy or sad movies, music, autobiographic memories, or positive or negative feedback about performance). The effects of induced affect are then explored in subsequent tasks in what participants believe is a separate, unrelated experiment. Experimental evidence for the adaptive benefits of negative affect will be summarized in four sections, discussing the benefits of negative affect for (1) memory, (2) judgments, (3) motivation, and (4) strategic interpersonal behaviors.

2. The regulatory effects of mood on memory performance

Memory is the mental faculty *par excellence* that should benefit from more attentive and externally oriented accommodative processing. Consistent with this reasoning, several recent experiments showed that more accommodative processing triggered by negative affect can indeed produce a variety of memory benefits. Memory requires an ability to access previously encoded knowledge, and is perhaps our most fundamental cognitive faculty (Forgas & Eich, in

press). Accurately remembering mundane, everyday scenes is a difficult and demanding task, yet such memories can be of crucial importance in everyday life, as well as in forensic and legal practice (Loftus, 1979; Neisser, 1982). Negative mood, by recruiting a more accommodative and externally focussed processing style, should result in improved memory performance.

2.1 Mood effects on memory

This expectation was investigated in a realistic field experiment, in a small suburban shop (Forgas, Goldenberg & Unkelbach, 2009). We placed a number of small unusual objects (little trinkets, toys, matchbox cars, etc.) near the check-out counter. Mood was induced naturally, by carrying out the experiment on cold, rainy and unpleasant days (negative affect), or bright, sunny, warm days (pleasant affect; Schwarz & Clore, 1983), and mood effects were further reinforced by playing sad or cheerful tunes within the store. We observed customers to make sure that they did see the objects we displayed, and after they left the shop, a young female research assistant asked them to remember as many of the little trinkets they saw in the store as possible (cued recall task) (Forgas, Goldenberg & Unkelbach, 2009). As expected, people in a negative mood (on rainy days) had significantly better memory for the objects they saw in the shop than did happy people questioned on a bright, sunny day (Figure 1).

Figure 1 about here

2.2 Mood effects on eyewitness accuracy

Thus, it seems that mild, natural moods can have a regulatory effect on information processing and memory accuracy, with negative mood improving memory, consistent with the assimilative / accommodative processing model. Remembering is not only influenced by what people pay attention to, but is also subject to contamination by subsequent incorrect information (Fiedler et al., 1991; Loftus, 1979; Wells & Loftus, 2003). For example, misleading information after the event can produce a false memory later on, the so-called misinformation effect (Loftus, 1979; Loftus et al., 2008; Schooler & Loftus, 1993). Affective influences on eyewitness memory distortions have received relatively little attention in the past (cf. Eich & Schooler, 2000; Schooler & Eich, 2000), although Fiedler et al. (1991) suggested over twenty years ago that we need to examine “the mediating role of mood in eyewitness testimony” (p. 376).

We hypothesized that more constructive and assimilative processing in positive moods may *impair* eyewitness accuracy by increasing the likelihood that misleading information will be incorporated into memories (Fiedler, Asbeck & Nickel, 1991). In contrast, negative mood by

triggering accommodative processing may regulate and constrain such distortions (Forgas & Bower, 2001; Forgas & Eich, in press). In one experiment we showed participants photos of a car crash scene (negative event) or alternatively, a wedding party scene (positive event; Forgas, Vargas & Laham, 2005, Exp. 1). One hour later, while in an induced happy or sad mood they received questions about the target scenes that either did, or did not contain misleading, false information (eg. ‘Did you see the stop sign at the scene? – there was a give way sign, but no stop sign). After a further 45-minute interval eyewitness memory for the target events was assessed.

As expected, negative mood reduced, and positive mood increased the tendency to assimilate misleading information into eyewitness memories. In fact, negative mood almost completely eliminated the common “misinformation effect” (Loftus et al., 2008). A signal detection analysis confirmed that negative mood selectively improved the ability to accurately discriminate between correct and false details. In a further experiment we staged a highly realistic 5-minute argument between a lecturer, and a female intruder in front of unsuspecting students (Forgas et al., 2005, Exp. 2). One week later misleading information was introduced when happy and sad eyewitnesses responded to questions about the incident that either did, or did not contain false, planted information (eg., ‘Did you see the young woman in a brown jacket approach the lecturer? – the intruder wore a black jacket).

Eyewitness memory remained more accurate when witnesses received the misleading information in a negative mood (Figure 2), also confirmed by a signal detection analysis. Interestingly, instructions to control this mood effect were ineffective, suggesting that the regulatory function of moods is largely automatic and subconscious. In a third study participants saw videotapes of a robbery or a wedding scene, and later received misleading questions in positive or negative mood. Exposure to misleading information reduced eyewitness accuracy for happy participants, but not for negative mood participants. These results are consistent with moods performing a regulatory function with negative affect improving accommodative processing and reducing the misinformation effect and positive mood having the opposite effect (Bless, 2001; Fiedler & Bless, 2001; Forgas, 1995, 2002).

Figure 2 about here

3. The regulatory effects of mood on judgments.

Many judgmental biases occur because judges place insufficient emphasis on actual external stimulus details and are guided too much by their internal expectations and constructions. For

example, judging the truth or falsity of information may be influenced by internal heuristics, such as the 'truth effect', when cognitively fluent information is more likely to be judged as true than disfluent information. Subjective ease of processing, or fluency, is one of the most influential internal cues people use in truth judgments (Unkelbach, 2006). The experience of cognitive fluency itself is determined by a variety of factors, such as the familiarity, complexity and clarity of the target information (Alter & Oppenheimer, 2009). Consistent with affective regulation hypothesis, positive affect may increase, and negative affect decrease the extent to which people rely on internal heuristic cues, such as fluency in their truth judgments (Oppenheimer, 2004). When we asked happy or sad participants to judge the truth of 30 ambiguous statements presented with high or low visual fluency (against a high or low contrast background), those in neutral and positive mood rated fluent claims as more true than disfluent claims (Figure 3). However, negative affect has a regulatory effect and completely eliminated the fluency effect, consistent with a more externally focused and accommodative processing style (Bless & Fiedler 2006; Fiedler, 2001).

Figure 3 about here

3.1 Primacy effects

Another judgmental bias, primacy effects, occur because judges rely too much on early information and ignore later details (Asch, 1946; Crano, 1977; Kelly, 1950; Luchins, 1958). Such first impressions can be important in many everyday situations such as speed dating, job interviews, political communication, marketing and advertising. As moods can play an important role in regulating processing strategies (Bless & Fiedler, 2006; Forgas, 2002, 2007), primacy effects could be reduced by negative mood that recruits more attentive, accommodative thinking style (Forgas, 2011). In one study, participants first received a mood induction (reminisced about happy or sad events in their past), and then formed impressions about a target character, Jim based on two paragraphs describing introverted and extroverted features of Jim, with the order of the paragraphs manipulated (Luchins, 1958). There was a significant overall primacy effect; however, consistent with our regulatory prediction, positive mood increased and negative mood eliminated this common judgmental bias compared to the control condition (Figure 4).

Figure 4 about here

3.2 Halo effects

Halo effects occur when judges assume that a person having some positive features is likely to have others as well. For example good-looking people are often judged to have more desirable personalities (Dion, Berscheid & Walster, 1972), or a young unorthodox-looking female may be seen as less likely to be a competent philosopher compared to a middle-aged male. In one recent experiment (Forgas, 2011b) we asked happy or sad judges to read a short philosophical essay, with a photo of the writer attached showing either a casually dressed young female, or a tweedy, bespectacled older male. The appearance of the 'writer' indeed exerted a significant halo effect on judgments. However, those in a negative mood were less influenced by the appearance of the writer than were judges in a positive mood, consistent with the predicted regulatory effect (Figure 5.)

Figure 5 about here

3.3 Inferential errors

The fundamental attribution error (FAE) or 'dispositional bias' occurs when judges infer intentionality and internal causation and ignore situational causes. By promoting more accommodative processing, negative affect should reduce the incidence of the FAE by directing greater attention to external, situational information (Forgas, 1998). In one experiment happy or sad participants read and make inferences about the writers of essays advocating popular or unpopular positions (eg. for or against nuclear testing) which they were told was either assigned, or freely chosen by the writer (eg. Jones & Davis, 1967). Mood did have a regulatory effect, with negative mood reducing and positive mood increasing the FAE. These effects were confirmed in a follow-up field study; again, those in a negative affective state were less likely to make incorrect, dispositional inferences based on assigned, coerced essays. There was also direct evidence for the predicted regulatory processing effects. An analysis of recall data showed that those in a negative mood had better memory for essay details (Forgas, 1998, Exp. 3), consistent with their more accommodative processing style. A mediational analysis confirmed that processing style was a significant mediator of mood effects on judgmental accuracy

3.4 Gullibility versus scepticism.

Social knowledge is often untested and potentially misleading, and rejecting valid information as false (excessive scepticism) is just as dangerous as accepting invalid information as true (excessive gullibility). Negative affect may have an overall beneficial regulatory influence on reducing gullibility and increasing scepticism. For example, when happy or sad participants

were asked to judge the likely truth of a number of urban legends and rumours (Forgas & East, 2008a), we found that negative mood increased scepticism and reduced gullibility, especially for new and unfamiliar claims. In a follow-up experiment we manipulated the familiarity of ambiguous claims taken from trivia games. Positive mood increased gullibility, and negative mood again increased scepticism, consistent with a regulatory effect promoting a more externally focused and accommodative thinking style.

In a further study participants judged the truth general knowledge trivia statements, and were also informed whether each claim was actually true. Two weeks later, only participants in a negative mood could correctly distinguish between true and false claims, whereas those in a positive mood rate all previously seen claims as true, consistent with mood-induced regulatory differences. Thus, negative mood conferred a clear adaptive advantage by promoting a more accommodative, systematic processing style (Fiedler & Bless, 2001), and the more accurate discrimination between true and false claims.

3.5 Detecting deception

As negative affect seems to regulate attention to stimulus details, it may also improve people's ability to detect deception (eg. Lane & de Paulo, 1991). For example, when happy or sad participants were asked to detect deception based on the videotaped interrogation of people accused of theft (Forgas & East, 2008b), those in a negative mood were more likely to make guilty judgments, but they were also significantly better at correctly distinguishing between truthful and deceptive targets (Figure 6). Negative affect, by regulating processing styles, enhanced people's ability to discriminate between deceptive and truthful targets according to a signal detection analysis (Forgas & East, 2008b).

Figure 6 about here

Deception is particularly difficult to detect in interpersonal communication, and nonverbal expressions are notoriously hard to judge (Ekman & Sullivan, 1991; Jones, 1964;). Mood may also regulate processing vigilance when interpreting nonverbal signals. For example, when happy or sad participants were asked to judge the genuineness of positive, neutral and negative facial expressions, those in a negative mood were significantly less likely to accept facial displays as genuine than were people in the neutral or happy condition. Judgments of the genuineness of the six basic emotions (i.e., anger, fear, disgust, happiness, surprise and sadness) showed a similar effect. Once again, consistent with affective regulation, negative mood increased and positive mood reduced processing vigilance and people's tendency to accept the facial displays

as genuine, consistent with the more attentive and accommodative processing style associated with negative moods.

3.6 Affective regulation of stereotyping

Affective states can also influence stereotyping (Bodenhausen, 1993). We explored the regulatory effects of mood on the implicit use of stereotypes using the shooter's bias paradigm, by asking happy or sad people to make rapid decisions about shooting or not shooting at targets who did or did not hold a weapon, and did, or did not appear to be Muslims (visually identifiable by wearing a turban). The effects of stereotypes about groups such as Muslims are difficult to assess using explicit measures, as people are unable or unwilling to reveal such prejudices. Implicit measures such as the IAT also suffer from serious shortcomings (Fiedler, Messner, Bluemke, 2006). A disguised measure looking at subliminal response tendencies (Forgas, 2003) is the 'shooter bias' paradigm (Correll et al., 2002) where individuals have to shoot only at targets who carry a gun. US participants show a strong implicit bias to shoot more at Black rather than White targets (Correll et al., 2002; Correll et al. 2007).

We expected that Muslims may elicit a similar subliminal bias in a shooters' task, and consistent with the regulatory prediction positive mood should increase, and negative mood reduce this stereotype effect. Happy or angry participants were asked to shoot at targets appearing on a computer screen *only* when they were carrying a gun. We used morphing software to create targets who did, or did not appear Muslim (wearing or not wearing a turban or the hijab), and who either held a gun, or held a similar object (eg. a coffee mug; see Figure 7). There was a significantly greater tendency overall to shoot at Muslims, but negative affect actually *reduced* this selective tendency. Consistent with the regulatory prediction, positive affect increased assimilative processing and the tendency to rely on pre-existing stereotypes and shoot at Muslims, but negative mood reduced this effect (Bless & Fiedler, 2006; Forgas, 1998, 2007).

Figure 7 about here

4. Affective regulation of motivation

The previous experiments explored the cognitive regulatory effects mood states. Affect can also have an important regulatory influence on motivation. In an early discussion of these effects Clark and Isen (1982) argued that positive affect can reduce the motivation to engage in effortful activity by automatically triggering strategies designed to maintain and prolong a pleasant affective state – the *mood maintenance* hypothesis. In contrast, negative affect can

motivate increasing effort as a means to improve an unpleasant affective state – the *mood repair* hypothesis (Frijda, 1986). A similar idea was proposed by Schwarz (1990) in a ‘*cognitive tuning*’ model suggesting that positive and negative affective states perform an automatic regulatory function, motivating the organism to preserve or repair their affective state. Thus, feeling good can signal a safe, familiar situation requiring little effort and motivation while negative affect acts like a mild alarm signal, triggering more effort and motivation. A conceptually related idea was developed by Carver and Scheier (1999) who argues that positive and negative affect function as feedback signals about goal achievement – positive affect signals progress and the need for reduced effort, while negative affect indicates lack of progress and the need for greater effort. Several of our experiments also support for such dichotomous regulatory effects of motivation.

4.1 Regulating perseverance

Exerting effort necessarily entails a fundamental psychological conflict. Although effort is costly in the short term, long-term success depends on present effort (Lyubomirsky, King & Diener, 2005). In terms of Atkinson’s (1957) Expectancy-Value model, people should only engage in effortful achievement-orientated actions if both the subjective probability of success (*expectancy*) and the incentive value of success (*value*) are high. Thus, the incentive value of the goal and the motivation to act partly depend on the perceived value of the desired end states (Feather, 1988; 1992).

4.2 Hedonistic discounting.

When a person is already in a positive affective state, this may result in the *discounting* of the hedonistic value of expected future success, reducing perseverance and motivation (the *hedonistic discounting hypothesis*). In contrast, present negative affect may result in a higher evaluation of the hedonistic benefit of future success, improving effort and motivation. We tested this hypothesis by instructing happy and sad participants to work on a demanding cognitive abilities task comprising a number of difficult questions for as long as they like. Perseverance was assessed by measuring the total *time spent* on the task, total *number of questions attempted* and total number of questions *correctly answered*. Expectancy-related and task-value beliefs were also assessed.

As predicted, affect had a regulatory influence on effort. Happy participants spent much less time working on the task compared to those in a negative mood, attempted fewer items, and scored fewer correct answers (Figure 8). A mediational analyses supported the hedonistic

discounting hypothesis, as it was mood-induced differences in task-value beliefs that mediated mood effects on perseverance. These results support the theoretical prediction that current affect can produce a regulatory effect on effort, by influencing the perceived value of future achievement.

Figure 8 about here

4.3 Affective influences on self-handicapping

Finding or creating spurious reasons for non-achievement is a particularly intriguing case of self-regulation. Such self-handicapping (Jones & Berglas, 1978) occurs when people create artificial handicaps for themselves as a means of protecting the self from damaging attributions due to expected failure (Rhodewalt, Morf, Hazlett & Fairfield, 1991). We hypothesized that self-handicapping might also serve a second regulatory purpose: to preserve a pleasant affective state. In a recent study (Alter & Forgas, 2007) we predicted that positive mood should increase, and negative mood decrease self-handicapping behaviors. Participants received manipulated feedback about their performance on a task of 'cognitive abilities', leading some of them to doubt their ability to do well on this task that they expected to perform again later in the experiment. After a positive, neutral, or negative mood induction using films, self-handicapping was assessed in an 'unrelated' task by assessing their preference to (a) drink a performance-enhancing, or performance-inhibiting herbal tea, and (b) engage or not engage in performance-enhancing practice.

Positive affect increased self-handicapping when participants doubted their ability to perform well on a subsequent task. Happy persons preferred the performance-inhibiting tea, and engaged in less task-relevant practice (Figure 9). Negative affect in turn reduced self-handicapping. Thus, it appears that feeling good may compromise the motivation to work hard for future hedonistic benefits. In contrast, the little recognized beneficial regulatory effects of negative mood on achievement may be important in organisational settings increasing perseverance and reducing self-handicapping (Alter & Forgas, 2007; Goldenberg & Forgas, 2012).

Figure 9 about here

5. The affective regulation of interpersonal strategies

Managing our interpersonal relationships is perhaps the single most demanding cognitive task we face in everyday life, and there is growing evidence that moods play a significant regulatory role in how we relate to others. The 'social brain' hypothesis (Dunbar, 2007) suggests

that the demands of managing and coordinating interpersonal relationships was the primary reason for the evolution of the human brain. Affective reactions represent probably the primary dimension of relating to others (Zajonc, 1980), and it seems that social relationships cannot be properly managed without affective input (Itoh & Damasio, 2007). Evolutionary psychologists have also speculated affect may automatically regulate the manner and intensity of our relations with others (Forgas, Haselton & von Hippel, 2007; Tooby & Cosmides, 1992).

More recent work demonstrated several specific regulatory effects associated with mood. According to the Affect Infusion Model (Forgas, 1995a), mood states should produce a mood-congruent effect on many interpersonal behaviors, with positive mood selectively priming more optimistic, positive, confident and assertive behaviors, while negative affect should prime more pessimistic, negative interpretations and produce more cautious, polite and considerate interpersonal strategies (Bower & Forgas, 2001; Forgas, 1995; 2002). Thus, in situations calling for self-confidence and assertiveness (such as negotiation, or self-disclosure) positive affect may confer distinct regulatory benefits (Forgas, 2008, 2011; Forgas & Gunawardena, 2001). However, in situations where more cautious and attentive processing is required, it may be negative affect that produces real interpersonal benefits.

5.1 Requesting

Asking somebody to comply with a request is a complex communicative task that requires careful regulatory strategies: requests must be formulated with just the right degree of assertiveness vs. politeness so as to maximize compliance without giving offence. While positive mood may prime a more optimistic and confident interpretations of the request situation, and thus produce a more assertive and less polite requesting style, negative mood should lead to more polite and considerate requests, a prediction now supported in several experiments (Forgas, 1999a). When happy or sad persons were asked to select among, or produce requests they would use in easy or difficult social situations (Forgas, 1999a), sad persons used more polite and happy participants preferred more assertive and impolite requests. These mood effects were greater when requests were generated in difficult situations and thus required more elaborate, substantive processing. In an unobtrusive experiment (Forgas, 1999b, Exp. 2), the experimenter unexpectedly asked happy or sad participants to get a file from a neighboring office. Their words when making the request were more polite and elaborate in negative mood, whereas positive mood produced more direct and less polite strategies (Figure 10). These

effects occur because mood states selectively prime access to more affect-congruent interpretations and thus have a subconscious regulating effect on interpersonal strategies.

Figure 10 about here

5.2 Persuasion.

The regulatory consequences of affect may also extend to social influence strategies such as persuasion. If negative affect triggers closer attention to external information, this may also improve the effectiveness of social influence strategies such as persuasion. Despite much prior interest in how persuasive messages are responded to by *recipients* (eg. Bless et al., 1996; Eagly & Chaiken, 1993; Fabrigar & Petty, 1999; Petty, De Steno & Rucker, 1991, Petty, Wegener & Fabrigar, 1997; Sinclair, Mark & Clore, 1994), affective influences on the *production* of persuasive messages attracted far less attention (but see Bohner & Schwarz, 1993). We predicted that accommodative processing promoted by negative affect should result in more concrete and factual thinking and more effective persuasive messages (Forgas, 2007). When we asked happy and sad participants to write persuasive arguments for or against an increase in student fees, and Aboriginal land rights, those in a negative mood produced more concrete, higher quality and more effective persuasive arguments. Similar results were obtained in other experiments using different mood inductions and different attitude issues (see Figure 11), consistent with negative mood promoting a more concrete processing style (Bless, 2001; Bless & Fiedler, 2006; Fiedler, 2001; Forgas, 2002).

Figure 11 about here

Ultimately, the regulatory effectiveness of moods was tested by presenting the persuasive arguments produced by happy or sad participants to a naive audience of students whose attitudes on the target issues were previously assessed. Arguments written in negative mood were significantly more effective in producing real attitude change than were arguments produced by happy participants. Affect also exerted a regulatory influence on communication style in a study where happy and sad people were asked to write persuasive arguments for a “partner” to volunteer for a boring experiment using e-mail exchanges (Forgas, 2007). Negative mood again resulted in higher quality persuasive messages than did positive affect. A mediational analysis showed that negative mood recruited more accommodative processing, and led to more concrete and specific arguments. These results are consistent with affective states regulating processing strategies, and negative affect triggering more concrete,

accommodative and externally focused information processing styles (Forgas, 1998; Forgas et al., 2005).

Figure 10 about here

5.3 Selfishness versus fairness

One of the recurring conflicts in interpersonal behavior is the need to reconcile self-interest with the interests of others. Economic games such as the dictator game and the ultimatum game allow a precise investigation of such strategies; for example, if somebody gave you a hundred dollars, and your job was to divide the money between yourself and another person any way you like, what would you do? How much would you keep for yourself? A series of our experiments looked at mood effects on the level of selfishness vs. fairness people display in strategic interactions such as the dictator game and the ultimatum game. We predicted that negative mood might increase, and positive mood reduce concern with the fairness of allocations. In the *dictator game* the allocator has the power to allocate a scarce resource (eg. money, etc.) between himself and another person in any way they see fit. In the *ultimatum game*, proposers face a responder who has a veto power to accept or reject the offer. If rejected, neither side gets anything.

Classical economic theories predict that rational actors should always maximize benefits to the self. In reality, instead of rational selfishness, proposers often offer a fair and sometimes an even split to others (Güth, Schmittberger & Schwarze, 1982), showing that decisions are not simply driven by the desire to maximize benefits to the self. Moods may regulate such strategies in at least two ways. In terms of affect priming, negative mood might prime more careful, cautious, pessimistic and socially constrained responses and reduced selfishness. Positive affect in turn should prime more confident, assertive, optimistic and ultimately, more selfish decisions. Affect can also influence *processing tendencies*. As Bless and Fiedler (2006) suggested, negative affect may recruit more *accommodative*, externally focused processing and greater attention to the needs of others, and positive affect facilitates more internally focused, *assimilative* thinking and greater selfishness.

In the dictator game (Tan & Forgas, 2010) we found that happy players were significantly more selfish and kept more scarce resources (such as raffle tickets) to themselves than did sad players. Overall, those in a sad mood were more fair and gave more resources to their partners, supporting our main hypothesis (Figure 12).

Figure 12 about here

Interesting, such regulatory mood effects on fairness also endured in the more complex decisional environment faced by players in the ultimatum game, where proposers must necessarily consider the willingness of responders to accept or reject their offers (Forgas & Tan, 2012). As hypothesized, those in a negative mood allocated significantly more resources to others than did happy individuals. These mood effects could also be directly linked to regulatory mood effects on processing style, as sad individuals took longer to make allocation decisions than did happy individuals, consistent with their expected more accommodative and attentive processing style. If negative mood indeed promotes more accommodative and externally oriented processing, we should find that responders in a negative mood should also be more concerned with external fairness norms, and therefore should be more likely to *reject* unfair offers.

When we looked at mood effects on *rejections* (Forgas & Tan, 2012), we found evidence for greater concern with external fairness norms in negative mood. Overall, 57% of those in negative mood *rejected* unfair offers compared to only 45% in the positive condition, consistent with regulatory theories that predict that negative mood should increase and positive mood reduce attention to external fairness norms. This pattern is conceptually consistent with other recent findings demonstrating the regulatory effects of negative mood, increasing attention to external information. As we have seen, negative affect was found to improve eyewitness memory, reduce stereotyping, increase politeness, and reduce judgmental errors (Forgas, 1998, 1999; Forgas et al., 2009; Unkelbach et al., 2009). Such results challenge the common assumption in much of applied, organisational, clinical and health psychology that positive affect has universally desirable cognitive and social consequences. Managing personal relationships in particular involves a great deal of elaborate strategic information processing, and it is an intriguing possibility that mild affect may play a regulatory role in promoting more or less assimilative versus accommodative processing styles.

6. Summary and Conclusion

The evidence reviewed here shows that mild, everyday affective states or moods can perform an important regulatory function in triggering more or less assimilative or accommodative processing strategies, and so can provide distinct adaptive advantages in many everyday social situations. Overall, these results are consistent with recent evolutionary

theories that suggest that the affective repertoire of our species has been largely shaped by processes of natural selection, and all of our affective states – including the unpleasant ones – can function as ‘mind modules’ and can produce functional benefits in some circumstances (Tooby & Cosmides, 1992). These way of looking at the regulatory effects of mood stands in stark contrast with the overwhelming and unilateral emphasis on the benefits of positive affect in the recent literature, as well as in contemporary popular culture (Forgas & Eich, in press; Forgas & George, 2001).

Taking such a functionalist, regulatory perspective suggests that positive affect is *not* universally desirable, and negative affect is not always harmful. We mostly looked at the cognitive, motivational and interpersonal consequences of mild, temporary mood states here, of the kind that we all regularly experience in everyday life. As we have seen, people in a negative mood are less prone to judgemental errors (Forgas, 1998), are more resistant to eye-witness distortions (Forgas et al., 2005), are more motivated (Goldenberg & Forgas, in press), are more sensitive to social norms (Forgas, 1999), and are better at producing high-quality and effective persuasive messages (Forgas, 2007). These findings are broadly consistent with the notion that over evolutionary time, affective states became adaptive, regulatory devices that promote motivational and information processing strategies that are appropriate in a given situation. We have only begun to explore the regulatory effects of mood on memory, thinking and judgements; this intriguing area deserves further experimental investigation.

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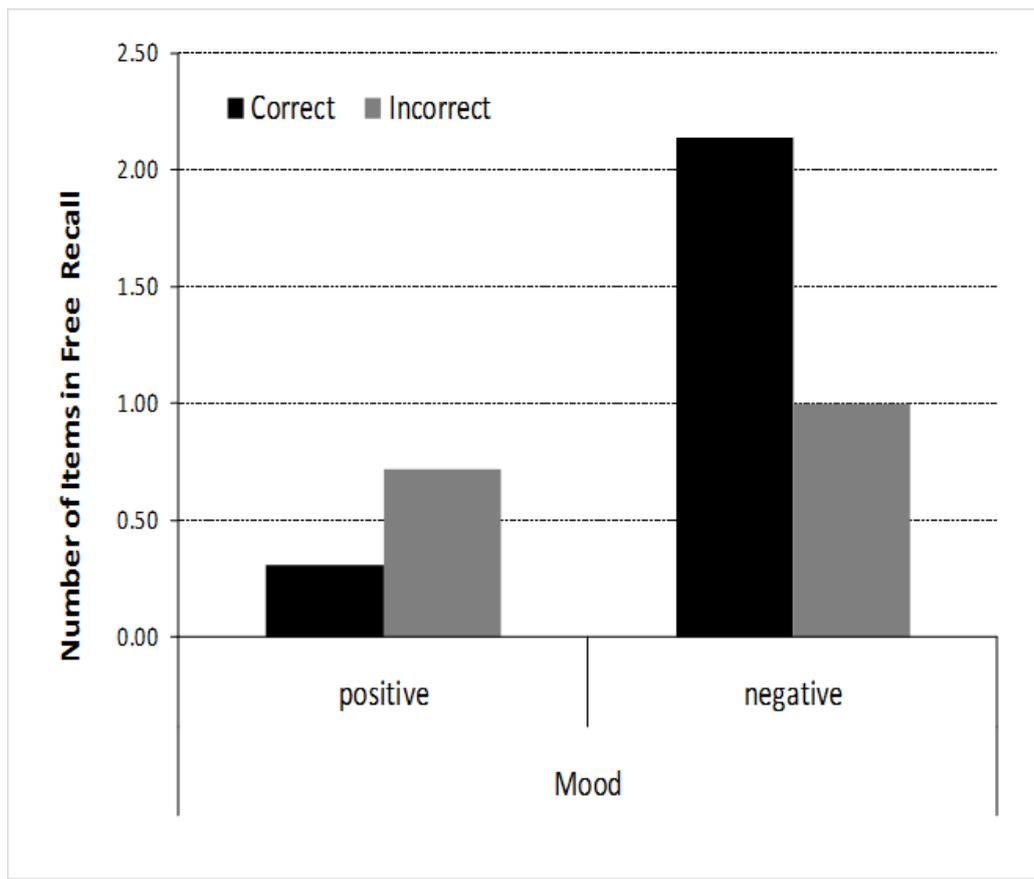


Figure 1. The effects of good or bad mood, induced by the weather, on correct and incorrect recall of items casually seen in a shop. (After Forgas et. al, 2010).

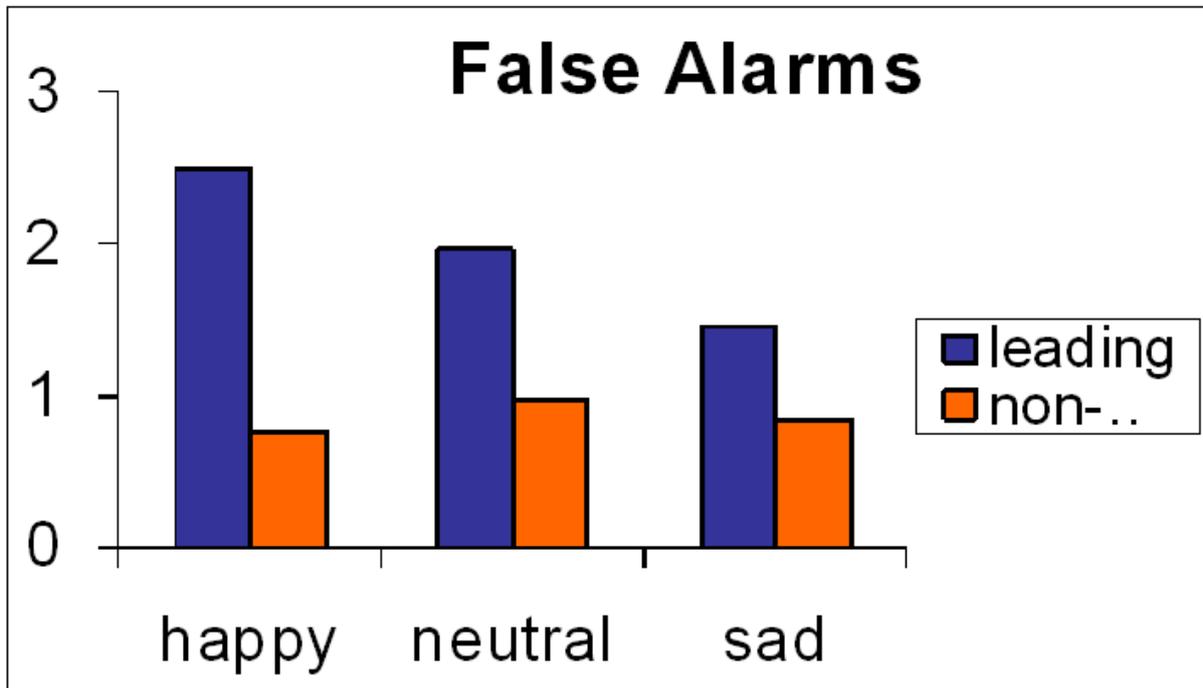


Figure 2. Mood effects on the tendency to incorporate misleading information into eyewitness memory (Experiment 2): negative mood reduced, and positive mood increased eyewitness distortions due to misleading information (false alarms; after Forgas, Vargas & Laham, 2005).

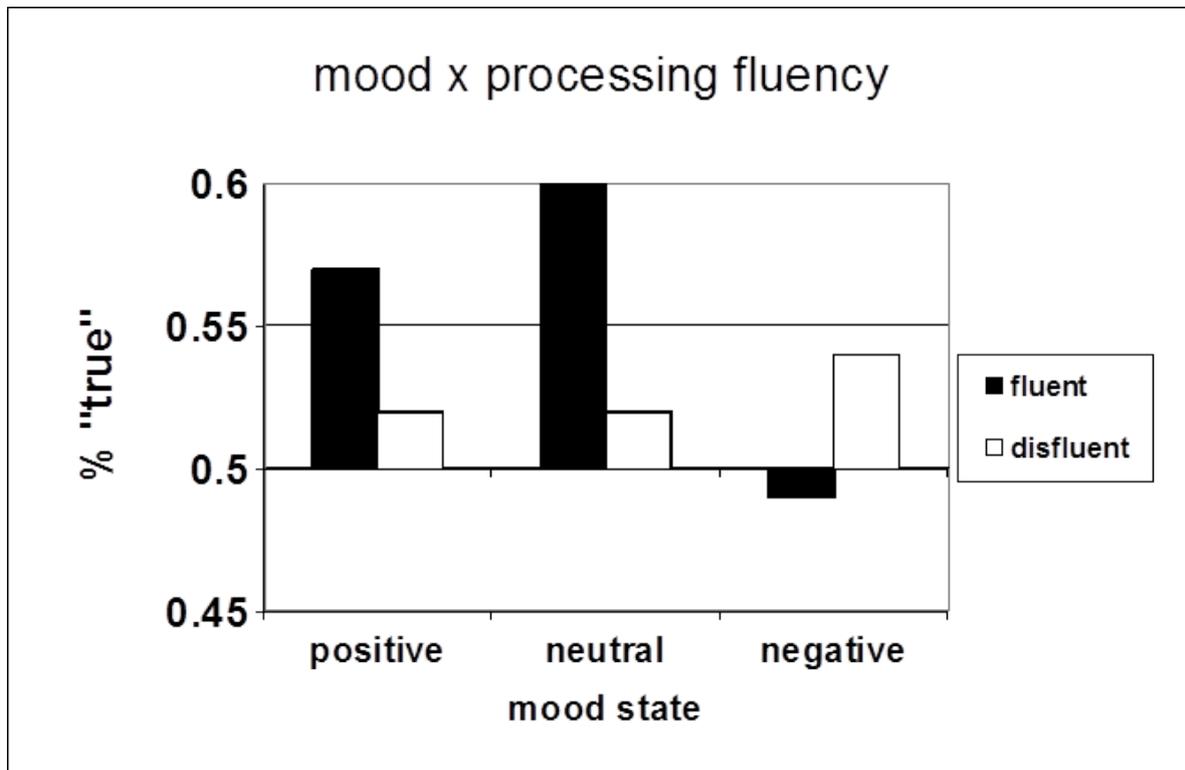


Figure 3. The interactive effects of mood and perceptual fluency on truth judgments: negative negative mood significantly reduced the tendency for people to rely on visual fluency as a truth cue (after Koch & Forgas, in press).

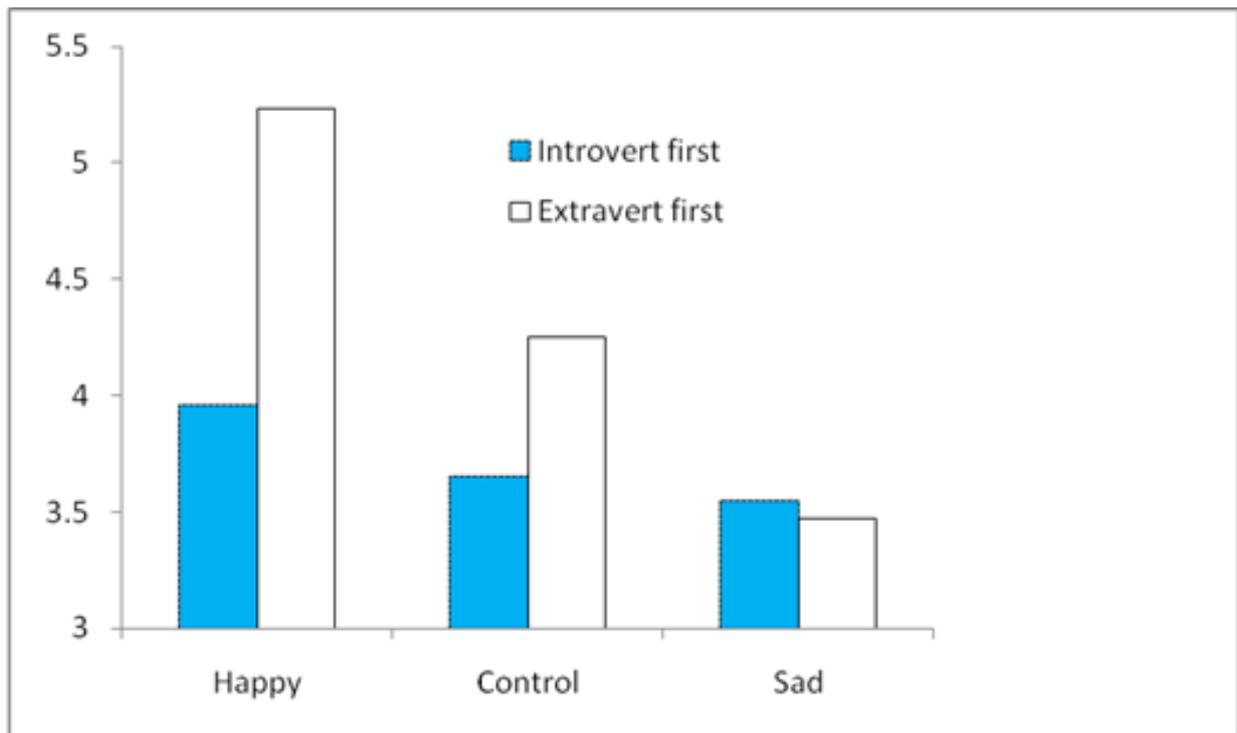


Figure 4. The effects of mood and primacy on the evaluation of a target person: positive mood increases, and negative mood reduces the primacy effect on evaluative judgments (vertical axis; after Forgas, 2011).

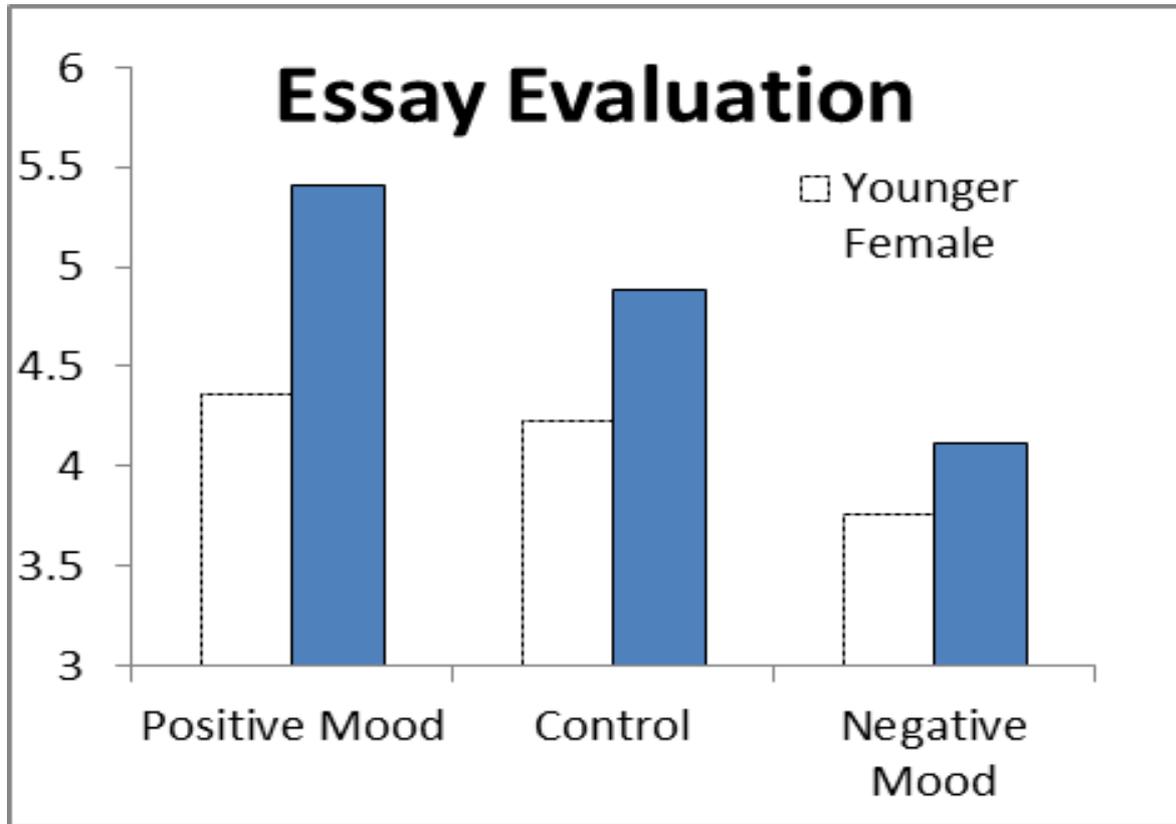


Figure 5. Mood moderates the incidence of halo effects on the evaluation of an essay: positive mood increased, and negative mood eliminated the halo effect associated with the appearance of the writer (after Forgas, 2011b).

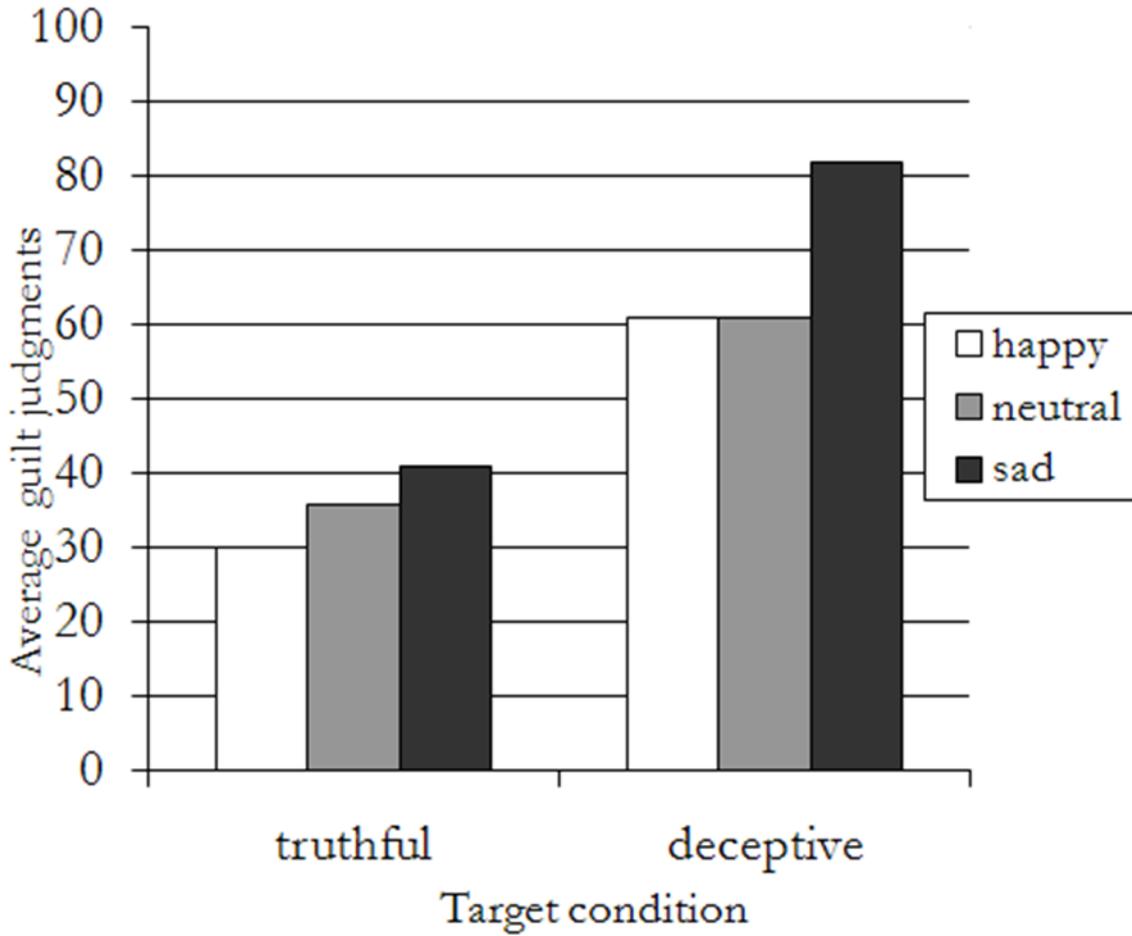


Figure 6. The effects of mood and the target’s veracity (truthful, deceptive) on judgments of guilt of targets accused of committing a theft (average percentage of targets judged guilty in each condition (After Forgas & East, 2008b).

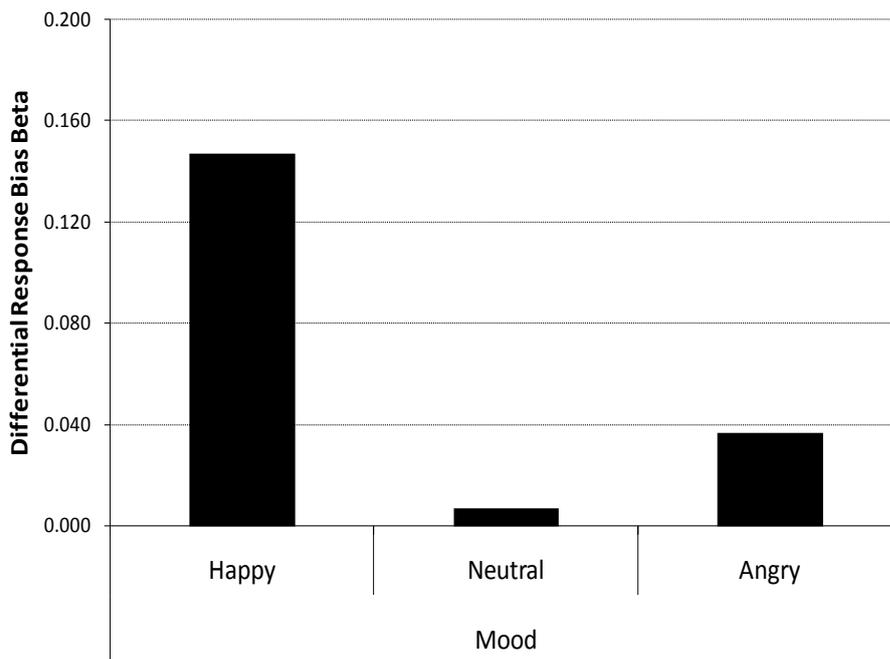
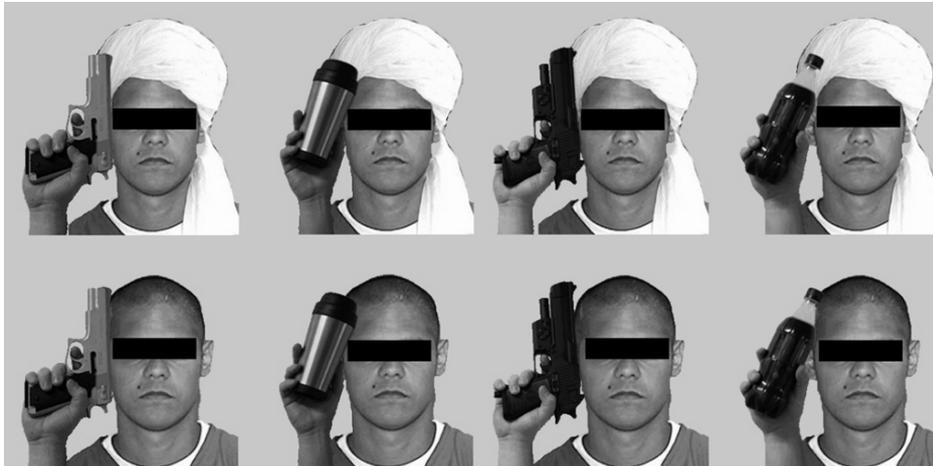


Figure 7. The turban effect: Stimulus figures used to assess the effects of mood and wearing or not wearing a turban on subliminal aggressive responses. Participants had to make rapid shoot / don't shoot decisions in response to targets who did or did not hold a gun, and did or did not wear a Muslim head-dress (a turban). Those in a positive mood were more likely, and those in a negative mood were less likely to selectively shoot at targets wearing a turban.

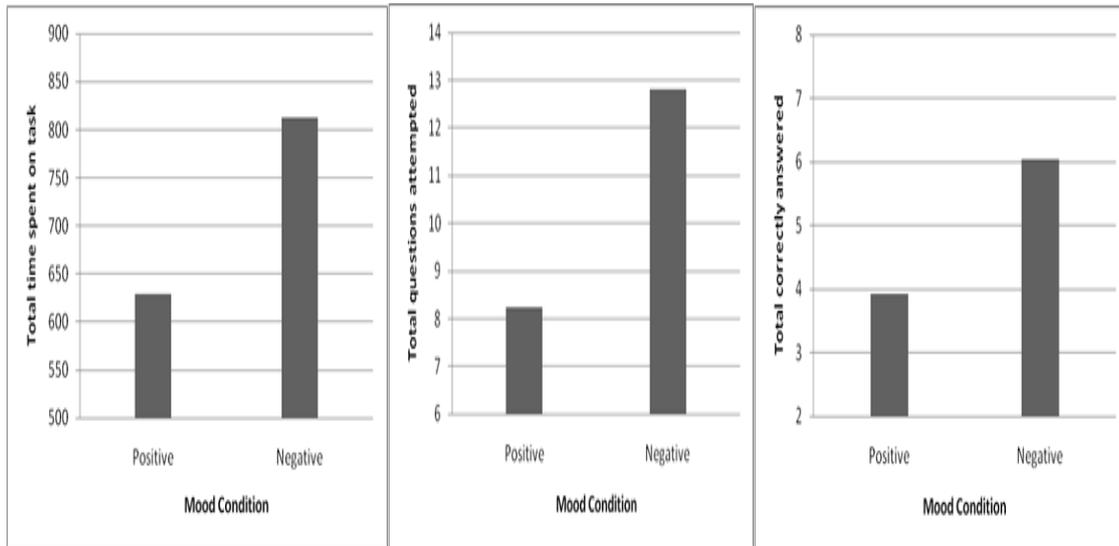


Figure 8. Positive affect reduces perseverance: The effects of induced mood on (a) the time spent (in seconds) on persevering with a cognitive abilities task, (b) the number of tasks attempted, and (c) the number of questions correctly answered (After Goldenberg & Forgas, 2012).

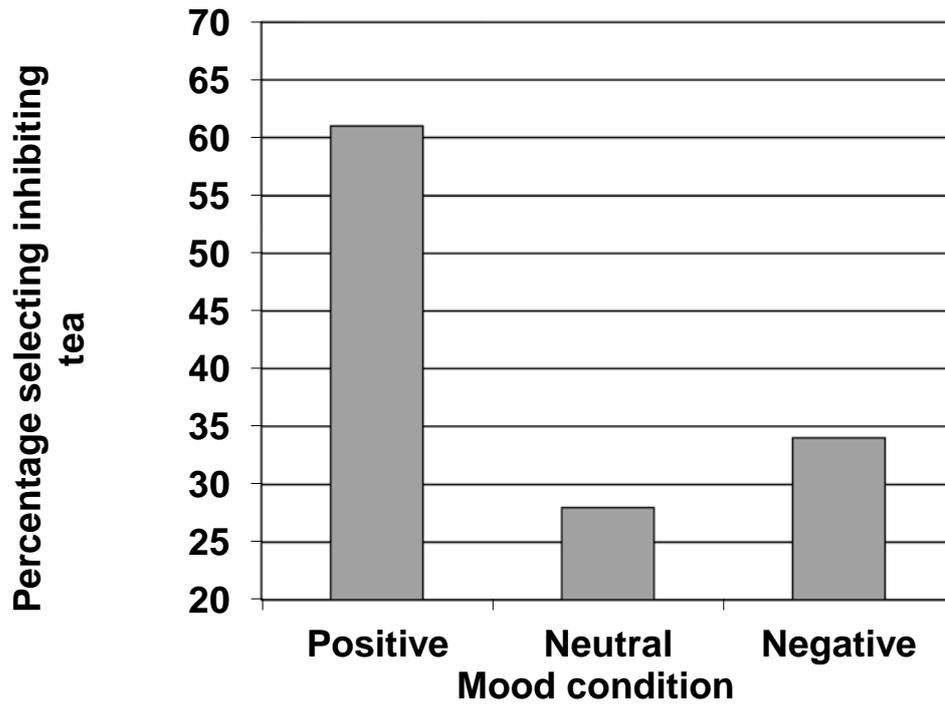


Figure 9. The effects of induced mood on self-handicapping: Percentage of participants who selected the performance impairing tea as a function of mood condition (After Alter and Forgas, 2007).

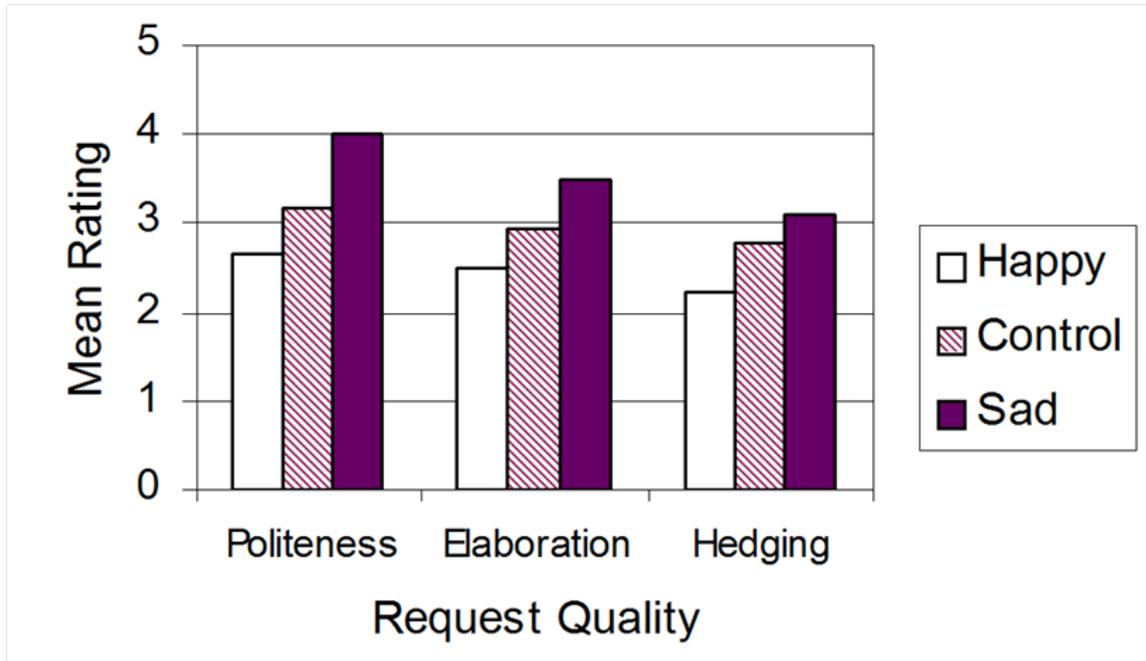


Figure 10. Mood effects on naturally produced requests: Positive mood increases, and negative mood decreases the degree of politeness, elaboration and hedging in strategic communications (After Forgas, 1999b).

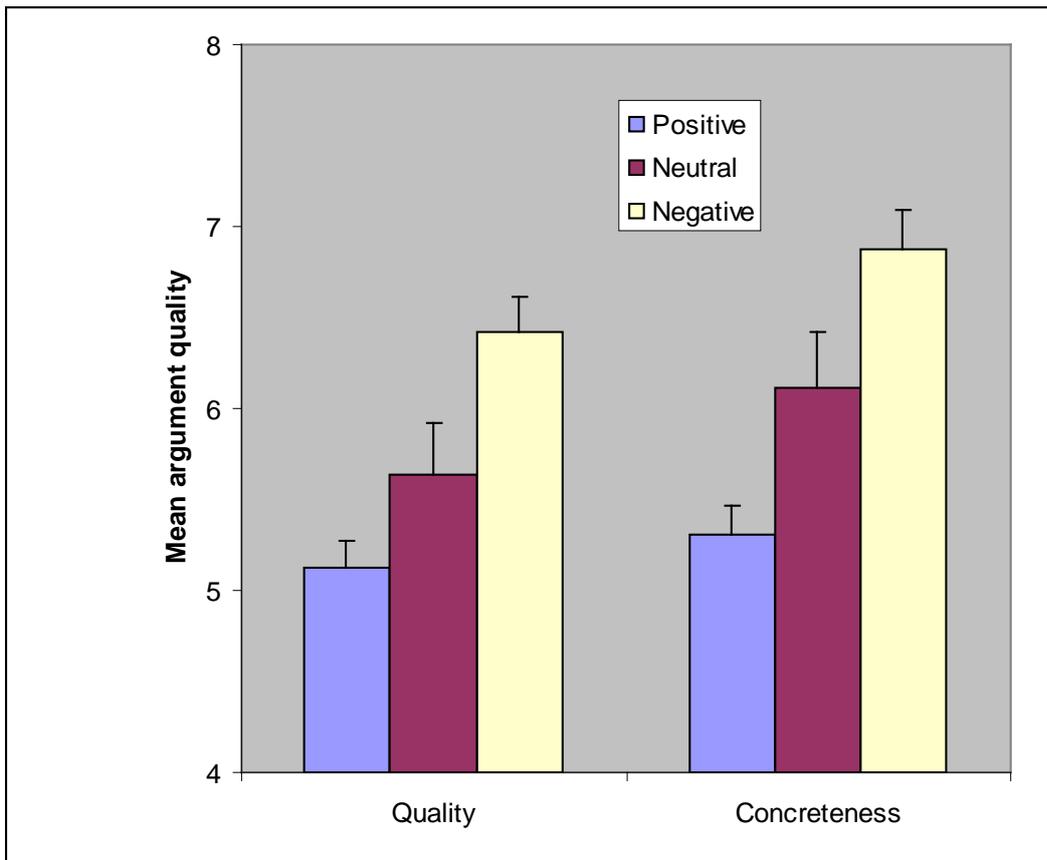


Figure 11. Mood effects on the quality and concreteness of the persuasive messages produced: negative affect increases the degree of concreteness of the arguments produced, and arguments produced in negative mood were also rated as more persuasive (After Forgas, 2007, Experiment 2).

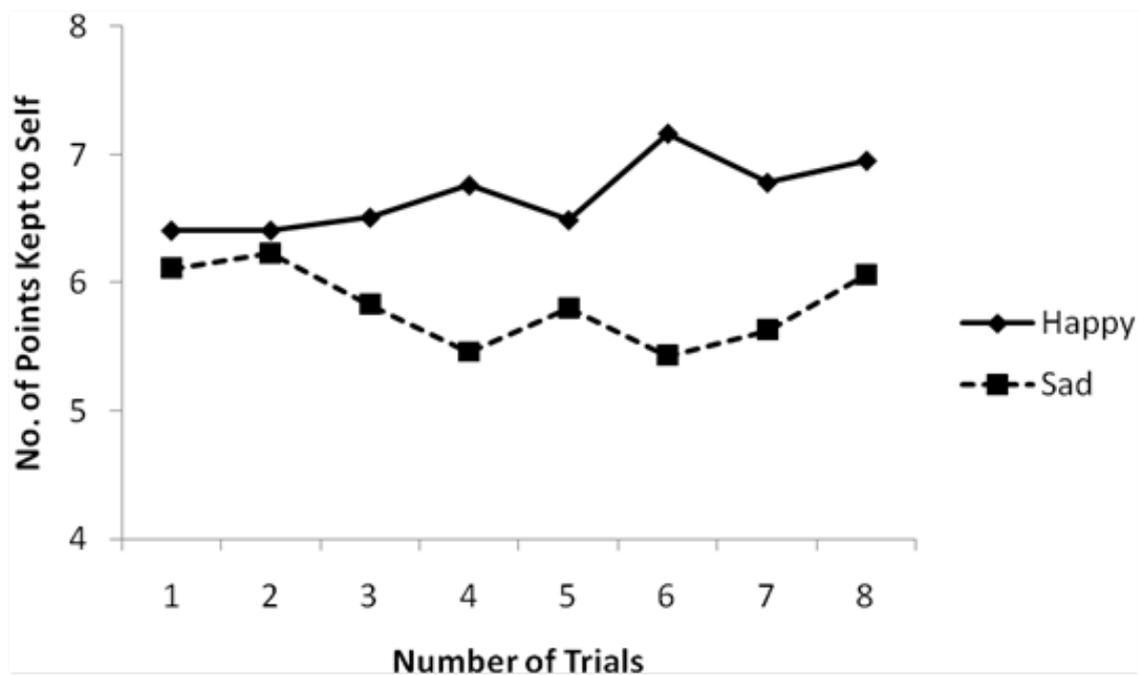


Figure 12. The effects of mood on selfishness vs. fairness: happy persons kept more rewards to themselves, and this effect is more pronounced in later trials.